

**FHWA-HI-EIS-78-01-F**

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

**FINAL ENVIRONMENTAL IMPACT STATEMENT**

**KEAAU-PAHOA ROAD, PAHOA BY-PASS  
PROJECT NO. RS-130 (17)**

**FAS ROUTE 130 from Vicinity of Kahakai Boulevard to  
approximately 2.8 miles south of the Pahoa-Kapoho-Kalapana Junction**

**U. S. DEPARTMENT OF TRANSPORTATION**

**Federal Highway Administration**

**and**

**STATE OF HAWAII DEPARTMENT OF TRANSPORTATION**

**Land Transportation Facilities Division**

**FEBRUARY 1979**



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ADMINISTRATIVE ACTION  
FINAL  
ENVIRONMENTAL IMPACT STATEMENT

U.S. DEPARTMENT OF TRANSPORTATION  
Federal Highway Administration  
and  
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION  
Land Transportation Facilities Division

*Submitted pursuant to 42 U.S.C. 4332 (2), (C), and 23 U.S.C. 128 (a).*

\_\_\_\_\_  
Date

\_\_\_\_\_  
DIRECTOR  
Office of Environment and Design  
Region 9

SUMMARY

- A. ADMINISTRATIVE ACTION  
FEDERAL HIGHWAY ADMINISTRATION
- ( ) Draft                    (X) Final
- (X) Environmental Statement
- B. PERSONS TO CONTACT FOR ADDITIONAL INFORMATION
1. Mr. Ralph T. Segawa  
Division Administrator  
U.S. Department of Transportation  
Federal Highway Administration  
300 Ala Moana Boulevard, Suite 4119  
P. O. Box 50206  
Honolulu, Hawaii 96850  
Telephone No. 546-5150
  2. Mr. Tetsuo Harano, Chief  
Hawaii Department of Transportation  
Land Transportation Facilities Division  
869 Punchbowl Street  
Honolulu, Hawaii 96813  
Telephone No. 548-5710
- C. DESCRIPTION OF THE PROPOSED ACTION

The project is located in the Puna District in the vicinity of Pahoa Village on the Island of Hawaii. The existing roadway under consideration is a portion of the Keaau-Pahoa-Kalapana Road (Route FAS 130), starting from the vicinity of Kahakai Boulevard to approximately 2.8 miles south of the Pahoa-Kapoho-Kalapana Junction. Two concepts were considered: (1) an improvement through Pahoa Town, and (2) a by-pass of the town. A route through town would continue to route all traffic through town along a limited right-of-way. A by-pass would divert a portion of the traffic and thereby decrease traffic and noise levels in the more densely populated areas and increase safety. After evaluating the social, economic, and environmental impacts, alternative C, the improvement of the road through Pahoa Town, was deleted. The by-pass alternatives were studied and analyzed; after considering their environmental impacts, benefit/cost ratio, and socioeconomic impacts alternative A1 is being recommended.

D. SUMMARY OF ENVIRONMENTAL IMPACTS

1. Grading operations during construction will alter the existing landform and will temporarily expose the soil to wind and water erosion. Mitigation measures such as watering and landscape plantings will be part of the project.
2. Infiltration of rainfall will be reduced over the roadway width due to paving, compaction and drainage controls. The redistribution of recharge will be negligible and is not expected to adversely affect water supply or ground water levels.
3. The proposed project will have an insignificant impact on vegetation and wildlife. No endangered or rare species of flora and fauna inhabit the project area.
4. Air pollutant emissions will occur from vehicles using the highway, but the concentrations are not expected to exceed State and Federal Ambient Air Quality standards as a result of the proposed project.
5. Noise levels associated with traffic using the highway will affect 4 residences. The exact impact of noise will depend on the location of the alignment (in relationship to the receptor sites) and the implementation of abatement measures.
6. Two residences will be displaced.
7. The recommendation of alternative A1 will mean a probable loss of sales to the tourist. This loss is equivalent to an estimated net income of \$33,000 per year for the business in Pahoa.
8. The project is not expected to affect community growth nor is it expected to alter the community profile of the Pahoa area.
9. Approximately 12.4 acres of agricultural land (in production) will be displaced. These lands, evaluated in terms of their land value, and

the multiplier effect on agriculture amounts to an annual agricultural production of \$15,000.

10. The aesthetic quality of the area is not expected to be significantly or adversely reduced.

E. SUMMARY OF MAJOR ALTERNATIVES

1. A no action alternative was considered pursuant to Federal and State EIS guidelines. It was determined that a no action alternative would have greater adverse environmental impacts than the alternative alignments. Additionally, the no action alternative will allow current inadequate and unsafe conditions to continue.

2. Alternative Alignments

- a. Alternative A/A1 - By-Pass Route (Southeast of the Existing Road)

This alternative involves the construction of a new roadway southeast of the existing road, around Pahoa Town. Basic provisions include a two-lane highway with partial access control and a minimum design speed of 50 MPH. The proposed right-of-way width is 100 feet, including two 12-foot lanes with 10-foot shoulders. Alternative A would cost \$3,987,950 and have a benefit/cost ratio of 1.53.

Subalternative A1 is a variation of Alternative A with a modified beginning point and connection to Kalapana Road. These modifications provide a smoother transition to the existing roadways. Subalternative A1 would cost \$4,080,250 and have a benefit/cost ratio of 1.49. Subalternative A1 is the recommended alignment.

- b. Alternative C - Improve Existing Road

This alternative would widen and modify the existing roadway

alignment through Pahoia Town. The proposed right-of-way width is 50 feet, including two 12-foot lanes, one 8-foot parking lane, curbs, gutters, and 8-foot sidewalks on both sides of the road. The design speed would be 30 MPH. Alternative C would cost \$5,313,350 and have a benefit/cost ratio of 0.62. (Alternative C was deleted from consideration due to the probable adverse environmental impact it would create.)

c. Alternative E/E1 - By-Pass Route (Southwest of the Existing Road)

This alternative involves the construction of a new roadway southwest of the existing road, around Pahoia Town. Basic provisions include a two-lane highway with a minimum design speed of 50 MPH. The proposed right-of-way width is 100 feet, including two 12-foot lanes with 10-foot shoulders. Alternative E would cost \$4,000,200 and have a benefit/cost ratio of 1.04.

Subalternative E1 is a variation of Alternative E. Its beginning point was modified to provide a smoother transition. Subalternative E1 would cost \$3,822,850, and have a benefit/cost ratio of 1.08.

3. Legislative Restrictions

Land use control, car pooling, limited operating hours, and other legislative restrictions were considered as a project alternative to reduce projected transportation demands.

4. Public Transit

Public transit was considered as an alternative to the proposed highway.

F. ORGANIZATIONS AND PERSONS CONSULTED

Section XI and Appendix A includes a comprehensive listing of organizations and persons consulted during the preparation of the EIS.

G. MAILING LIST FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

The following pages indentifies the organizations and individuals receiving a copy or copies of the Draft EIS for review.

Federal Agencies

Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture

Soil Conservation Service, U.S. Department of Agriculture

Forest Service, U.S. Department of Agriculture

Director, Office of Environmental Project Review, U.S. Department of Interior

U.S. Department of Housing and Urban Development (Honolulu Office)

U.S. Department of Health, Education and Welfare

Council of Environmental Quality

National Park Service, Attention: Mr. Robert L. Barrel

Environmental Protection Agency, Region IX

Advisory Council on Historic Preservation, Attention: Mr. Robert Garvey,  
Executive Director

U.S. Department of Commerce, Attention: Dr. Sydney R. Galler, Deputy  
Assistant

Federal Energy Administration, Office of Environmental Impact Division,  
Mr. Ernest E. Sligh, Director

U.S. Environmental Protection Agency, Region IX Library

State Agencies

Department of Agriculture

Department of Accounting and General Services

Department of Defense

Department of Education

Department of Health

State Historical Preservation Office, Department of Land and Natural Resources

Department of Land and Natural Resources

Department of Planning and Economic Development

Department of Social Services and Housing

Office of Environmental Quality Control

University of Hawaii

Environmental Center

Water Resources Research Center

Public Libraries

State Main Library

Hilo Regional Library

Pahoa Library

University of Hawaii (Sinclair and Hamilton Libraries)

Department of Planning and Economic Development Library

State Archives

Legislative Reference Bureau

County Agencies

County Council, County of Hawaii

Department of Planning

Department of Public Works

Department of Parks and Recreation

Department of Water Supply

Department of Research and Development

Public Utilities

Hawaiian Telephone Company

Hawaii Electric Light Co., Inc.

Gasco, Inc., Hawaii Division

Other Organizations

Bishop Museum

Life of the Land

American Lung Association

Puna Sugar Company, Attention: Mr. Charles Wallis

Puna Community Council

Conservation Council for Hawaii, Hawaii Island Chapter, Attention: Dr. P.  
Tomich

H. CHANGES MADE TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Listed below are the modifications made to the Draft Environmental Impact Statement and incorporated in the Final Environmental Impact Statement.

<u>Page</u>	<u>Modification</u>
Inside Cover Sheet	Top, left-hand corner. From: FHWA-HI-78-01-D, to: FHWA-HI-78-01-F. New cover sheet made so that date and signatures (bottom of page) can be written in. (Revised)
i	Change (x) from Draft to Final. Also add in the information that alternative A1 is being recommended. (Revised)
ii	Revised to reflect the impacts of alternative A1; items 5, 6, 7, and 8. (Revised)
iii, iv	Revised to reflect the impacts of alternative A1; item 9, items 11 and 12 eliminated (item 11 does not relate to alternative A1, item 12 omitted in response to comments from the Planning Department, County of Hawaii).  Under E.2., Alternative Alignments, rewritten to provide for sub-alternatives A1 and E1; also corrections in the cost of alternatives and identification of the recommended alternatives. (Revised)
viii	Change Sheet. (New)
Table of Contents	Revised as per changes made.
1	Last paragraph revised to incorporate information from the Department of Research and Development, County of Hawaii. (Revised)
3	State EIS requirement, per OEQC's comments. (Revised)
4	Middle of page, corrected "Commission" to the State Office of Environmental Quality Control, as indicated in the letter from the Office of Environmental Quality Control.  Added information on the processing of the Draft Environmental Impact Statement. (Revised)
5	Added information on the Public Hearing held on March 16.  Revised information on cost of alternatives and alternative A1. (Revised)
6	Revisions based on recommended alternatives A1. (Revised) Added footnote 1 for elaboration of Alternative A1.

<u>Page</u>	<u>Modification</u>
9	Revisions based on recommended Alternative A1. (Revised)
14	Middle of page, changed "east" to "north" as per the Office of Environmental Quality Control's comment. (Revised)
17	Added information on Puna District as provided by the Department of Research and Development, County of Hawaii. (Revised)
18	Revised due to the additional information as indicated (page 17). (Revised)
19a	Added information on the economic activity of the area from the Department of Research and Development, County of Hawaii. (Revised)
19b	Added page due to the expansion of pages 17 and 19. (New)
21	Minor corrections: Delete "in the next few weeks," underscore <u>General Plan</u> . (Revised)
22	Corrections made on page which reflects that the Puna CDP is a Draft document which has not been officially accepted, per the comments of the Planning Department, County of Hawaii. (Revised)
24	Updating to identify the intent of the final EIS (new second paragraph). Eliminate original second paragraph. (Revised) Page 25 retyped due to the added information on page 24.
26	Revised to indicate the recommended alternative A1 effect on potable water supply. Also to include the comments from the Department of Water Supply, County of Hawaii. (Revised) Page 27 retyped due to the added information on page 26.
28	Under Sections E and F the recommended alternative (A1) was reviewed for specific impact. (Revised) Information on the Federal List of Endangered Plants and Animals added.
29	Because discussions in this section were limited primarily to alternative A1, the last paragraph which discussed the impact of alternative C was eliminated. (Revised)
31	Footnote 1 was added to respond to the comments by the U. S. Army Corps of Engineers on the adequacy of a cursory traffic observation. (Revised)
32	Revisions reflect the impact of the recommended alignment A1. (Revised)
34	Section added: "4. Impact on Prime Agricultural Lands" (New)
35	Revisions reflect the impact of the recommended alignment A1. (Revised)
36	Last line, added: (See Benefit/Cost Analysis, Appendix K.) (Revised)
37	Added: (For additional details, refer to the Benefit/Cost Analysis Appendix K.) (Revised)

<u>Page</u>	<u>Modification</u>
40	Explanation of use of 2 mile figure in air pollution calculations. (Revised)
42	Change to reflect the recommended alignment A1. (Revised)
43	Added (in the middle of the page): (Refer to Figure 6 for Peak Hour L <sub>10</sub> Noise Level Contour, Year 2000.) (Revised)
46	New page, Figure 6 (map), Peak Hour L <sub>10</sub> Noise Level Contour, Year 2000. (New)
48	Revision in the middle of page based on the recommended alternative A1. (Revised)
49	Revision in Table 10 reflects that 4 residences will be affected by noise.
50, 51	Section 8. <u>Corrective Measures</u> added based on recommended alternative A1.
52	Added information on the rationale for the recommendation of alternative A1; also, notation about Final EIS. (Revised) Page 56 retyped based on the added information on page 52.
56	Table 14 on page 56 has been revised to reflect the comparisons of subalternatives A1 and E1, and to reflect the new costs. (Revised)
58	Table 15 revised to reflect alternatives A1 and E1.
59	Information added relating to the impact of alternatives A and A1 on telephone and poleline facilities, per the comments of the Hawaiian Telephone Company. Also, last paragraph reflects the support of alternative A at the Public Hearing. (Revised)
60	Information added relating to the State Historic Preservation Officer's concurrence with the decision to eliminate alternative C. (Revised)
61	Information added relating to the impact of alternative C on the telephone and poleline facilities, per the comments of the Hawaiian Telephone Company. (Revised)
62	Revised to accommodate the added information from previous pages, also, added information on last two paragraphs relating to the comments from the Hawaiian Telephone Company and the State Department of Accounting and General Services. (Revised)
67	Reflects corrected alternative cost figures. (Revised)
71	Information added regarding prime agricultural lands that will be taken by the recommended alternative A1. (Revised)

<u>Page</u>	<u>Modification</u>
72a-72b	Revised section of Historical/Archaeological as per comments received on Draft EIS. (Revised)
73	Changed first line to: "It is felt that the by-pass alternatives would be generally <u>complementary</u> with . . ." (underscore indicates the word change). (Revised)
78	New Section XII which identifies the agencies receiving the Draft EIS and the agencies commenting on the Draft EIS. (New)
79-82	New Table 17 identifying agencies receiving the Draft EIS, those agencies commenting on the Draft EIS. (New)
83	New Section XIII indicating the List of Necessary Approvals as per the comments from the Office of Environmental Quality Control. (New)
84	Bibliography section renumbered to Section XIV. (Revised)
EXH-10	Exhibit 7, Agricultural Lands of Importance to the State of Hawaii added.
EXH-11	Exhibit 8, Portion of the Proposed Alignment in which Potential/Archaeological Sites May Exist added.
APPENDIX J	Reproduction of correspondence commenting on the Draft EIS and the dispositions sent in response. (new) Old Appendix J deleted.
APPENDIX K	New Appendix K, Benefit/Cost Analysis. (New)
APPENDIX L	New Appendix L, Summary of Public Hearing. (New)

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## I. NEED FOR THE PROJECT

### A. Deficiency of the Existing Road

The Keaau-Pahoa Road is the main roadway serving the Pahoa, Kapoho, and Kalapana areas to Hilo. Its functional classification is a major collector road. The existing road through Pahoa Village was constructed over a horse and buggy trail with no design criteria nor uniformity considered. No records were kept of the progressive improvements to the existing trail and the present condition is a result of periodic maintenance and resurfacing projects by the County of Hawaii Public Works Department.

The existing road section through Pahoa Village is characterized by several features which contribute to the roadway's general inadequacy, operational inefficiency, and high accident rate. The existing Keaau-Pahoa Road is a two-lane road with sharp horizontal curves, limited sight distances, inadequate lateral clearances, narrow (9.5 feet to 10 feet) lanes, and a section of abrupt grade change. Because the present roadway travels through the commercial area of Pahoa, many private driveways front the road. The posted speed zone is 30 MPH through the residential area, 25 MPH through Pahoa Village, and 20 MPH through school zones and sharp curves.

The present route is the only major route servicing the following residential areas: Kapoho, Nanawale, Opihikao, Pohoiki, and Kaimu-Kalapana area. Scenic, recreational, and cultural attractions serviced by this route include Kapoho volcanic eruptions, Isaac Hale Beach Park, Lava Tree State Park, Pohoiki and MacKenzie Parks, Kapoho to Kaimu scenic route, Kalapana Black Sand Beach, Queens Bath, Harry K. Brown Park, and the Chain of Craters scenic route (presently closed). These areas are identified in Figure 3, page 12. In addition to these attractions the road services the museum-cultural center at Wahaula Heiau in the Hawaii Volcanoes National Park. This route also services the Hawaii Geothermal Project well, located a few miles east of Pahoa Town.

Traffic demand on the Keaau-Pahoa Road has increased significantly over the years and further significant increases are expected in the future. Traffic counts taken along Keaau-Pahoa Road in 1976 show an average daily traffic (ADT) of 3,600 vehicles west of the Keaau-Pahoa Road (Kahakai Boulevard) intersection and an ADT of 2,951 vehicles west of the Pahoa-Kalapana-Kapoho intersection. Traffic demand has increased from 1,275 vehicles per day to 2,951 vehicles per day from 1967 to 1976 and is projected to increase to 11,490 vehicles per day by 2000. The projected peak hour traffic for the year 2000 is expected to be 1,034 vehicles of which a high percentage (11%) will be trucks. Because of the inadequate conditions described above, temporary stoppages with unstable flow can be expected at this volume during peak hour.

B. Accident Rates and Safety

The accident rate on the Keaau-Pahoa Road through Pahoa Village is considerably higher than the surrounding area. The rates for the years 1973, 1974 and 1975 were 8.91, 9.94 and 5.74 accidents per million miles, respectively, as compared to the 1975 island-wide rate of 2.23 and the statewide rate of 2.16. Line of sight constraints at many driveways, limited lateral clearance, narrow traveled ways and sharp curves contribute to this relatively unsafe travel condition.

In addition to the improvement of the Keaau-Pahoa Road through Pahoa Village, it is proposed that a 2.8 mile section of the Pahoa-Kalapana Road be improved. The proposed Pahoa-Kalapana Road improvement adjoins Keaau-Pahoa Road and is the continuation of Route FAS 130 toward Kalapana. This section is a two-lane, two-way highway with narrow pavement and inadequate sight distances due to rollercoaster grades. This roadway section previously had 7-foot lanes; these lanes were widened by maintenance crews an additional 2.5 feet to provide 9.5 feet of surfaced area. However, the added surfacing is in poor condition.

Because the vehicles travel with one set of wheels on the added surfacing, the ride is unpleasant, and drivers traveling this portion of the Pahoa-Kalapana Road tend to drive over the centerline of the road when no cars are approaching in the opposite direction which constitutes a safety hazard.

Improvement of this section of the Pahoa-Kalapana Road would also conform with the adjoining southern section which has been improved to 11' to 12' lanes and is posted for 55 MPH.

C. Social, Economic and Environmental Effects of the No-Build Alternative

The social, economic and environmental effects of the no-build alternative include increasing road users costs, increasing noise levels which are in excess of allowable values for schools and residences, and decline safety.

D. Project Background

Engineering consultants were retained to review the alternative corridors in January, 1977. In order to evaluate the environmental impacts of the alternative corridors, environmental consultants were retained in March, 1977. The environmental documents prepared include a study on air quality (Appendix B); a noise study (Appendix C); and a socioeconomic impact study (Appendix D). These studies included field surveys and analysis of probable impacts in their respective areas of concern. The environmental consultants are further responsible for the preparation of the various necessary State and Federal environmental documents.

This EIS is also being prepared for the State's requirement for an EIS. In general, the State of Hawaii requires (Chapter 343, Hawaii Revised Statutes) an evaluation of environmental impacts for each project utilizing public lands, monies, or requiring governmental action. Chapter 343, HRS, and its related regulations, Environmental Impact Statement Regulations, requires that the proposing agency<sup>1</sup> evaluate the environmental consequences

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<sup>1</sup> For an agency action.

of a proposed action as early as possible. This early review process is called an Environmental Assessment (EA). The agency then determines the significance of the environmental impacts; if an action is deemed significant, an EIS Preparation Notice is then acknowledged in the Commission's EQC Bulletin. During the 30-day period after the publication of the project in the EQC Bulletin, the EIS Preparation Notice is sent to various governmental and private agencies which may have an interest in the project. These agencies are requested to review and comment on the EIS Preparation Notice in order to provide early comments and input prior to the preparation of the EIS. Upon completion of this 30-day period, the agency responds to these comments and prepares the Environmental Impact Statement (EIS). Upon completion of the EIS, the agency provides 60 copies to the Environmental Quality Commission. The availability of the EIS is published in the EQC Bulletin and a 30-day EIS review period begins. The Commission distributes the EIS to various agencies for review and comments. At the conclusion of the 30-day EIS review period, comments are answered and revisions to the EIS are made by the proposing agency. The document is then finalized and provided to the State Office of Environmental Quality Control for their recommendation of approval to the Governor. The Governor then accepts the Final EIS.

An Environmental Assessment and EIS Preparation Notice was prepared in April, 1977. The description of the project appeared in the EQC Bulletin of April 23, 1977 (Volume III, Number 8). During this period (April-May, 1977), the EIS Preparation Notice (See Section XI) was sent to 30 agencies for consultation and preliminary review. The comments received were answered (see Appendix A) and wherever possible, recommendations were incorporated into this EIS.

The Draft Environmental Impact Statement was submitted to the State Environmental Quality Commission on January 27, 1978. The agencies identified

on pages v, vi, and vii received a copy of the Draft EIS for review and comments. The deadline date for their response was before March 24, 1978. As of this date, twenty-seven (27) comments have been received. Copies of these comments, and where appropriate, dispositions to these comments are provided in Section XII.

Two informational meetings have been held for this proposed project. The first informational meeting was held on April 27, 1977 at the Pahoa Community Center. The second informational meeting was held on October 27, 1977, at Pahoa Community Center. Summaries of the two informational meetings are provided in Appendix G.

A corridor Public Hearing was held on March 16, 1978 in Pahoa, Hawaii. A summary of this meeting is provided in Appendix L.

E. Project Funding

The total cost of the proposed project would be \$4,080,250.

Federal funds will be requested for design and construction if this project is implemented. The approximate Federal/State share of this project is 70 and 30 percent respectively.

TABLE 1

COST COMPARISON OF ALTERNATIVES

<u>Alignment</u>	<u>Preliminary Engineering</u>	<u>Right of Way</u>	<u>Construction</u>	<u>Total Cost</u>
Alternative A	\$457,300	\$ 482,150	\$3,048,500	\$3,987,950
Subalternative A1	\$476,000	\$ 430,450	\$3,173,800	\$4,080,250
Alternative C	\$544,800	\$1,136,450	\$3,632,100*	\$5,313,350
Alternative E	\$483,800	\$ 290,800	\$3,225,600	\$4,000,200
Subalternative E1	\$473,000	\$ 196,650	\$3,153,200	\$3,822,850

\*Does not include utility pole relocation.

## II. DESCRIPTION OF THE PROPOSED ACTION

### A. Project Location

The project is located in the Puna District in the vicinity of Pahoa Village on the Island of Hawaii (see Figure 1, Location Map). The existing roadway under consideration is a portion of the Keaau-Pahoa-Kalapana Road (Route FAS 130), starting from the vicinity of Kahakai Boulevard to approximately 2.8 miles south of the Pahoa-Kapoho-Kalapana Junction.

### B. Alternatives

There were three basic alternative corridor alignments, shown in Figure 2 as alternative "A", "C", and "E".<sup>1</sup> The corridor alignments all began at Point "X", in the vicinity of Kahakai Boulevard, and terminated at Point "Y", about 0.7 miles south of the Pahoa-Kapoho-Kalapana Junction on Pahoa-Kalapana Road. Point "Y" is also the starting point for the Pahoa-Kalapana Road Improvement which extends about 2.1 miles south to Point "Z". The total length of the proposed project (Point "X" to Point "Z"), is approximately 4.4 miles.

### C. Corridors

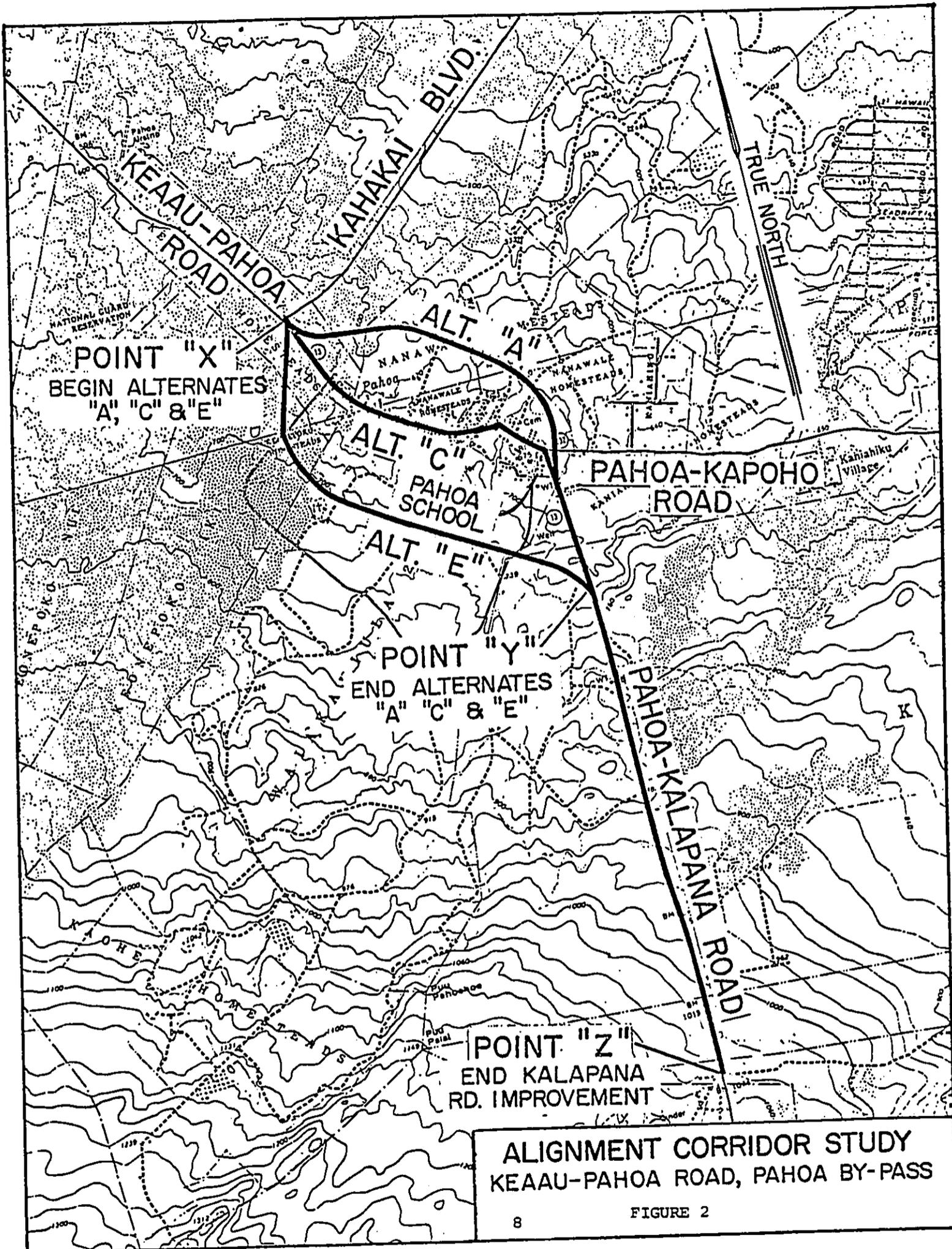
Two (2) concepts were investigated: (1) an improvement through Pahoa Town, and (2) a by-pass of the town. A route through town would continue to route all traffic through town along a limited right-of-way. A by-pass would divert a portion of the traffic and thereby decrease traffic and noise levels in the more densely populated areas and increase safety.

The alignment recommended, alternative A1 (shown in Exhibit 1) swings southeasterly from Point "X" and parallels the existing Keaau-Pahoa Road in town. The

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<sup>1</sup> Subalternatives "A1" and "E1", as shown in Exhibit 1, are modifications of the beginning and terminating segments of Alternatives "A" and "E", respectively. These subalternatives are variations of transitions from the existing road to the basic alternative corridor alignments.





ALIGNMENT CORRIDOR STUDY  
 KEAAU-PAHOA ROAD, PAHOA BY-PASS

alignment then turns southwesterly and intersects Pahoa-Kapoho Road near Pahoa School. The alignment then follows existing Pahoa-Kalapana Road in a southerly direction to Point "Y".

The alignment for Alternative "C" followed the existing Keaau-Pahoa Road from Point "X", through Pahoa Town to the Pahoa-Kapoho-Kalapana Junction. The alignment then followed Pahoa-Kalapana Road from the junction to Point "Y" to the south.

The alignment for Alternative "E" swung south from Point "X" and turned southeast parallel to the Keaau-Pahoa Road in town. The alignment then swung southerly to merge with Pahoa-Kalapana Road at Point "Y".

Alternatives "A" and "E" were high-speed "by-pass" corridors with partial access control, and design speed of 60 MPH. The proposed right-of-way width is 100 feet, including two 12-foot lanes with 10-foot shoulders as shown in Exhibit 2.

Alternative "C" approximated the existing Keaau-Pahoa Road corridor through Pahoa Town, thereby limiting the design speed to 30 MPH. The proposed right-of-way width was 50 feet, including two 12-foot lanes, one 8-foot parking lane, curbs, gutters, and 8-foot sidewalks on both sides of the road. Refer to Exhibit 3 for a typical section through Pahoa Town.

### III. SOCIAL, ECONOMIC AND ENVIRONMENTAL CONTEXT OF THE AREA

#### A. Natural Environment

1. Topography. Pahoa is located 20.5 miles south of Hilo on the eastern half of the Island of Hawaii. In general, the Pahoa Town area is level and lies about 600+ feet above sea level. Pahoa is situated inland, about 6 miles from the shoreline.

2. Geology and Soils. The Pahoa area was formed by lavas of the Kilauea Volcano which is the youngest and most active volcano in Hawaii. (Kilauea erupted 10 times since 1970). The basalts making up the area are extremely permeable; there is no surface water available, even during periods of precipitation, and the water table is near sea level.

The soils in the project<sup>1</sup> are identified as (1) Keaukaha extremely rocky muck 6 to 20 percent slopes (rKFD); (2) Lava flows, pahoehoe (rLW); (3) Papai extremely stony muck, 3 to 25 percent slopes (rPAE); and (4) Olaa extremely stony silty clay loam, 0 to 20 percent slopes (OID).

Generally, each soil series have in common the following characteristics: (1) shallow (less than 10 inches) or no soils (rLW)--with the exception of Olaa extremely stony silty clay loam (OID) which has a deeper (16 inches) surface layer; (2) rapid permeability; (3) runoff is slow; and (4) erosion hazard is slight.

3. Meteorology and Climatology. The Pahoa area receives a relatively large amount of rainfall, averaging between 150 to 175 inches annually. In general, the wind direction is predominantly from the northeast (trade winds) and that the annual temperature is between 75° to 80° F.

4. Hydrology. The Pahoa area does not have streams or surface waters. As mentioned in the description of the geology of the area, rainfall is

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<sup>1</sup> U.S. Department of Agriculture Soil Conservation Service, Soil Survey of the Island of Hawaii, State of Hawaii. Issued December, 1973.

quickly absorbed in the porous ground and does not accumulate on the surface. It was noted during various sites visits that no drainage facilities presently exist along the existing roadway. Additionally the area does not have a history of drainage problems.

Potable water is supplied to users in the area by wells which draw up ground water. The Pahoa Deep Wells (shown in Exhibit 1, Page Exh-1) a source of potable water for the area, is located off the Pahoa-Kalapana Road and are situated at an elevation of approximately 700 feet. The potable water system is under jurisdiction of the Department of Water Supply, County of Hawaii.

The Pahoa area is located inland (6+ miles) from the nearest shoreline. It is normal that the filtration of rainfall and surface runoff through the ground normally purifies the water prior to its subterranean transport to the shore areas. Therefore, no adverse impact to shoreline water quality is expected.

5. Vegetation and Wildlife. Vegetation within the Pahoa area consists of agricultural crops (primarily sugar cane), various tropical shrub land vegetation (commonly found throughout the Puna District), and landscaping. Table 2 identifies the predominant flora found in the open areas around Pahoa Village.

Wildlife in the project area include mongoose (Herpestes auropunctatus auropunctatus), house mouse (Mus musculus), Norway rat (Rattus norvegicus), roof rat (Rattus rattus), and Polynesian rat (Rattus exulans).

(Note: Only the mongoose was observed during the site visits to the project area. The remaining mammals identified here are those which are found throughout the islands and are no doubt existing in the area. It should also be mentioned that there is a possibility that domestic cats and dogs could also inhabit this area--in a wild state.)

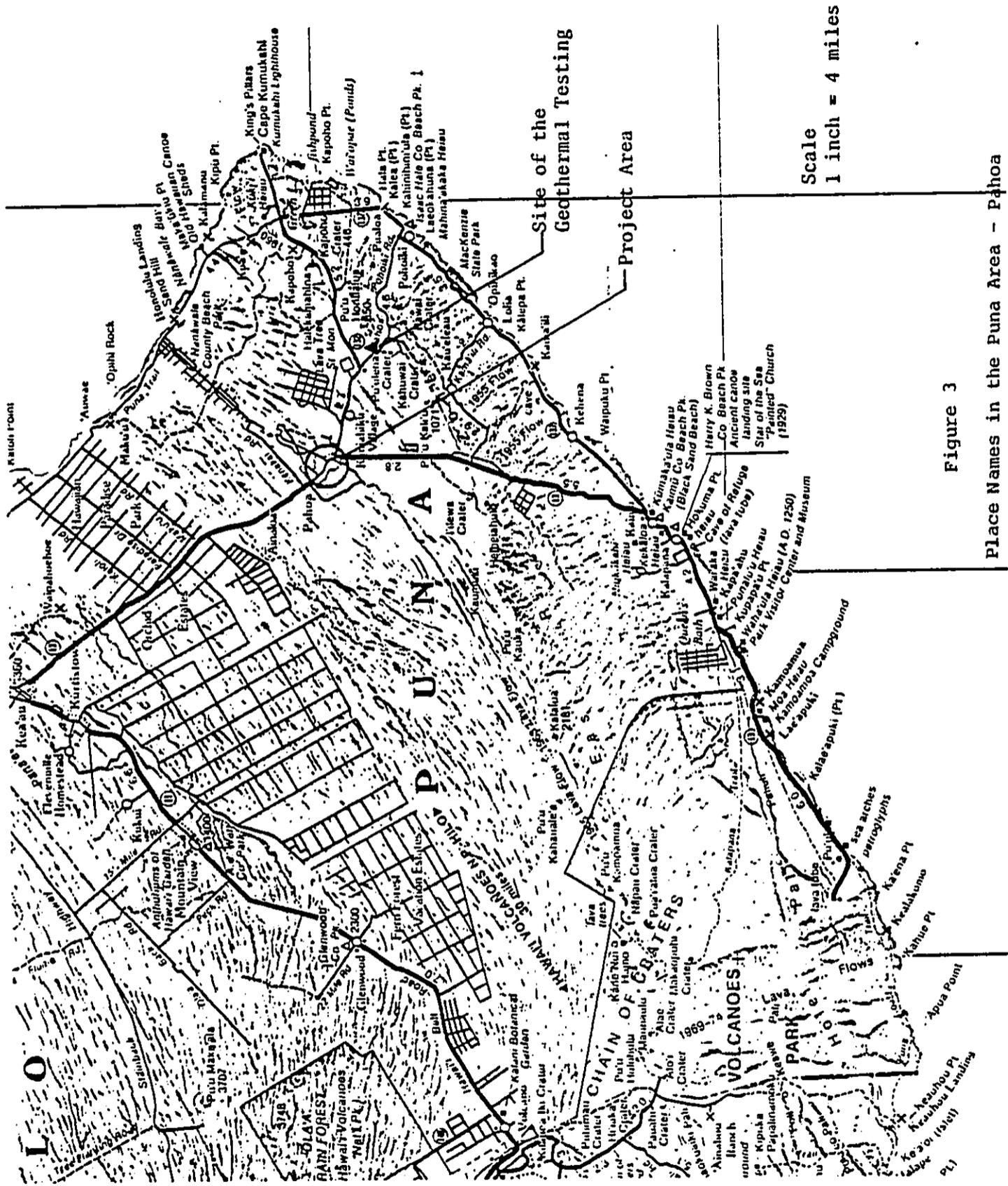


Figure 3

Place Names in the Puna Area - Pahoa

TABLE 2

## PREDOMINANT FLORA FOUND IN THE OPEN AREA AROUND PAHOA VILLAGE

<u>Common Name</u>	<u>Scientific Name</u>
1. Koa Haole	<u>Leucaena latisiliqua</u>
2. Lantana	<u>Lantana camara</u>
3. Guava	<u>Psidium guajava</u>
4. Strawberry Guava	<u>Psidium cattleianum</u>
5. Ironwood	<u>Casuarina spp.</u>
6. Christmas Berry Tree	<u>Schinus terebinthifolius</u>
7. Jamaica Vervain (Oi)	<u>Stachytarpheta spp.</u>
8. Wiliwili	<u>Erythrina spp.</u>
9. Morning Glory	<u>Ipomoea sp.</u>
10. Philippine or Wild Orchid	<u>Spathoglottis plicata</u>
11. Passion Fruit, Lilikoi	<u>Passiflora spp.</u>
12. Glory-Bush	<u>Tibouchina semidecandra</u>
13. Ti Plant	<u>Cordyline terminalis</u>
14. Ohia Lehua	<u>Metrosideros collina</u>
15. Hawaiian Tree Fern	<u>Cibotium spp.</u>
16. False Staghorn Fern	<u>Gleicheniaceae Dicranopteris sp.</u>
17. Small Tree Fern	<u>Sadleria cyatheoides</u>
18. White Ginger	<u>Hedychium coronarium</u>
19. Yellow Ginger	<u>Hedychium flavescens</u>

Source: Field observations--open areas mauka and makai of Pahoa village.  
Based on limited field visits.

Avifauna (birdlife) in the area includes: cardinals (Cardinalis cardinalis), barred dove (Geopelia striata striata), spotted dove (Streptopelia chinensis chinensis), i'iwi (Vestiaria coccinea), mockingbird (Mimus polyglottos), mynah (Acridotheres tristis), golden plover (Pluvialis dominica fulva), pueo or Hawaiian Owl (Asio flammeus), ricebird (Lonchura punctulata), house sparrow (Passer domesticus), and white eye (Zosterops japonica japonica).

6. Visual. Presently, there are no scenic view planes from the proposed bypass alternatives or the existing road. The level characteristics of the land (lying 600 feet above sea level) and the surrounding sugar cane area affords little or no scenic views from the existing road.

7. Natural Hazards. The project area is considered to be a high hazard area for volcanic hazards. The Pahoa area is located approximately 5 miles north of the Kilauea East Rift Zone. The rift zones of Kilauea (see Exhibit 5) are amongst the areas of highest volcanic risk. As stated in the U.S. Department of Interior, Geological Survey publication entitled, "Natural Hazards on the Island of Hawaii," (1976): *Rift zones are long, narrow belts of structural weakness that include cracks, fissures, craters, spatter cones and cinder cones.* Since 1959, 17 of Kilauea's volcanic eruptions have occurred along the East Rift.

The Pahoa area lies within the area designated as a relatively high hazard zone in regards to lava flows and earthquakes. This area has been designated "E", that is, that 0.5 to 3 percent of the land in area "E" has been buried (by lava) during various 20-year intervals (since 1800) leaving 97 to 99.5 percent of the land unaffected. (See Exhibit 5 with the accompanying table). The "E" designation represents:

*Area E includes the flanks of Kilauea and Mauna Loa that lie directly downslope from the summit areas and rift zones where*

*lava flows originate. Land labeled E is susceptible to burial by lava flows erupted within the summit and rift areas labeled F. In addition, vents along minor rift zones on Mauna Loa have erupted a few times within area E. Degree of risk within this area varies widely, but in general, it becomes less with increasing distance from the summits and major rift zones.*

Because the area is located inland (6+ miles) at an elevation of 600+ feet above sea level, it is not within the established tsunami zone.

B. Site Description

The physical characteristics of the general project area is described in sub-section A above. However, to orient the reviewer to the specific conditions of each of the alternative corridor, a brief description of the areas surrounding the existing route, and the southeastern and southwestern by-pass route alternatives are provided in this sub-section.

1. The Existing Keaau-Pahoia Road through Pahoia Town. As previously indicated, the existing road goes through the commercial area of Pahoia. The commercial area of Pahoia consists of service stations, barber shops, a school, several stores, restaurants, a theater, a church, a savings and loan institution, and a post office. Additionally, before and after the commercial area, numerous residential driveways front the road.

The width of the road varies from 16 to 34-foot pavement with 2 to 5 foot shoulders. Sidewalks fronting sections of the commercial establishments vary from 4 to 6 feet.

Photographs of the existing roadway through Pahoia Town are provided in Exhibit 4.

The major industrial firm utilizing the present route is Puna Sugar Co. (cane hauling equipment). Other industries utilize the route to market their products are the papaya, vanda orchid, anthuriums, lava

rock slabs, pumice or cinder, macadamia, citrus fruits, diversified farming including vegetable and beef cattle.

Beyond the limits of this project, west of Point X (see Figure 2 on page 8) on Keaau-Pahoa Road and south of Point Z on Pahoa-Kalapana Road, the existing roadway has eleven (11) to twelve (12) foot lanes, broad curves and a posted speed of fifty-five (55) MPH. This proposed highway improvement lies between these highway sections. The improvement will allow the roadway to meet the Federal major collector road standard. The long range plan for FAS 130 would be to bring the entire roadway section to the standards as proposed by the typical section (see Exhibit 2, page EXH-2).

2. Northeastern Corridor (Alternative A/A1). The northeastern side of Pahoa Village in the vicinity of Alternative A consists primarily of open space and sugarcane fields. The open space area is located in the vicinity of Kahakai Boulevard to approximately 3,000 ft. along Alternative A. Beyond that point, the eastern end of Alternative A consists of sugarcane fields (part of Puna Sugar Company's) acreage and some orchid and truck-type farms. These orchid and truck-type farms are primarily small scale operations of which a negligible amount will be affected.

The lands both northeast and northwest of Pahoa Village consists of rotted lava with shallow soils. The types of plants which predominantly exist in the open space area are ohia lehua, guava, morning glory, various types of fern, ti plant, lilikoi, koa haole, Christmas berry trees, lantana, and various types of weeds. This type of tropical shrub land vegetation is commonly found throughout the Puna District.

3. Southwestern Corridor (Alternative E/E1). The southwestern route is characterized by open areas as described in the previous paragraph. The one exception is that a greater amount (80%) of the area is in open space.

Additionally, the southwest side of Pahoia Village appears to be more greatly disturbed by man's previous activities (e.g. former pasture areas, former sugarcane lands, dirt roadways). Additionally, in this area there are more matured trees; for example, mango trees, Christmas berry trees, and large guava trees. The remaining lands located in the extreme southern portion of Alternative E (approximately 1,000 ft. before it connects onto Pahoia-Kalapana Road) consist of land parcels in sugar cane cultivation.

C. Socioeconomic Environment

A Socioeconomic Impact Study was prepared for the proposed project, this study is provided in Appendix D., Socioeconomic Impact Study, page D-1. The information below summarizes the findings of the study.

Pahoia is located in the Puna District. The Puna District is described by the Department of Research and Development, County of Hawaii (letter dated February 15, 1978) as:

"The Population of the Puna District has shown appreciable increases since the last Census of Population (1970). Indicators of this increase in population are the increases in school enrollment, voter registration, and level of residential construction activity.

Immediate past trends, anticipated economic and social activities point to continuous increases in population. The lower Puna area has numerous residential subdivisions of which most of the lots are still vacant and relatively inexpensive to purchase. The town of Pahoia has amenities such as the school, commercial, and social activities which are conducive to some further expansion. Also, the lower Puna area is within commuting distance of the City of Hilo, the major commercial, service, and population center of the east side of the Big Island of Hawaii."

The primary area affected by the proposed project is the small village of Pahoia and its neighboring subdivisions.

The population of Pahoia is approximately 1,000. The ethnic backgrounds of the residents are predominantly Japanese, Filipino, and Mixed Hawaiian, although the proportion of Caucasians has been rapidly increasing as Mainland in-migrants

move into the area. As is true in most rural towns of the United States, the population tends to have relatively few people in their twenties and thirties who had been raised in the area since childhood. Most of the longtime residents of the area came to Hawaii from foreign countries to work on the sugar plantations, or they are the children of such immigrants.

Approximately 60 percent of the adults have completed high school. The median household income is about \$10,000 annually. The unemployment rate is about 7 percent. About 25 percent of those working hold jobs in agriculture, 17 percent are employed in construction, 19 percent are in retail jobs, 16 percent are in service employment, and the remainder are in various other classifications such as manufacturing, etc. Annual incomes are under \$10,000 for 35 percent of the households, and only 2 percent have incomes above \$15,000. The population is anticipated to increase by 50 percent between 1976 and 1990 (or 500 persons for a total about 1,500 persons in Pahoa).

Land use in the area generally involves sugar cultivation on the better lands, with relatively small portions of the more marginal lands being used for tree crops and nursery production. There are large acreages of wasteland. Most of the land on the fringes of Pahoa and along the highways leading to the town is zoned A-1a, which has permitted subdivisions of one acre or more and the construction of a home on each parcel. (Such residential uses have seldom occurred thus far.) The residentially zoned land in town is primarily designated as RS-10 and RS-15, which permits single-family use on minimum parcel sizes of 10,000 square feet and 15,000 square feet, respectively. The bulk of such parcels is presently being used for residential purposes.

Several residential subdivisions are being developed near Pahoa (see Figure 3, page 12). This subdividing, primarily occurring in the late 1950's and early 1960's has caused land prices in the Puna District to be relatively low. Vacant lots in the district presently exceed 50,000. These vacant lots

have generally been selling for between \$2,000 and \$8,000 each. Such low prices have attracted people who might otherwise have lived in Hilo near their jobs and near a wider range of commercial and public services. (Commuting also leads such people to do a larger share of their shopping in Hilo rather than in Pahoa as compared to people who hold jobs near Pahoa.)

Commercial (not including agricultural) land uses are essentially confined to the parcels bordering the highway in the center of Pahoa. The proximity to the primary transportation corridor is vital to the survival of most of the existing businesses. Approximately 20 businesses exist in Pahoa, including cafes, general stores, service stations, a theatre, a fast food outlet, a gift shop, laundromats, a real estate office, a bank, a retail nursery, and miscellaneous other business establishments. Only the gift shop is primarily directed toward tourists; the rest of the businesses depend primarily or entirely on residents within the area for patronage.

Commercial activities have declined in Pahoa over the past three decades, as evidenced by vacant stores in the community. However, some of the businesses have noted significant increases in sales over the past few years, which they attribute to the new residents of the neighboring subdivisions, and in some cases to increases in tourism. Basically, the town can anticipate a continuing slow increase in business volume, assuming that nothing occurs which would divert or restrict these sources of increased patronage.

Within the Puna District, the major employer is the sugar industry with about 400 jobs, although the papaya industry has come to rival this place of importance by employing about 270 people full-time and 230 part-time. About one-third of the workers residing in Puna commute to Hilo. Since there is little reason to anticipate significant increases in employment in the Pahoa area, the anticipated population increases is employment in the neighboring subdivisions will require an increase in this level of commuting to Hilo for employment.

The economic activity of the lower Puna area is described by the Department of Research and Development, County of Hawaii (February 15, 1978), as:

"The primary economic activity in the lower Puna area is related to agriculture (sugar, macadamia, flowers and foliage, and papayas). These agricultural commodities (with the exception of sugar) have shown favorable growth trends in recent years and its growth and further development is anticipated.

Due to current marketing conditions and the availability of suitable lands for these agricultural pursuits, ornamental horticulture will continue to be expanded upon in this area. The plans of a large papaya farming operation also calls for the continued expansion of their field planting operations."

Pahoa is essentially a social and economic remnant of an earlier plantation era that required workers to be near their jobs, but to live in concentrated urban pockets that provided effective social control, economies of land use, and efficient means of providing community services. If the town did not exist at its present location, there would be little justification for constructing it there, for no major sources of jobs in sugar or papaya processing and cultivation nor in tourism exist at that location. Furthermore, the topographic and climatic features are not peculiarly conducive to residential development.

Nevertheless, such communities are continuing vital parts of society because of the strong sense of community identity that exists in such small towns. Most of its residents undoubtedly give little thought to moving elsewhere. The older residents deeply value the community as a source of social "security" and some of the newer residents have fled from more impersonal metropolitan settings in order to benefit from the social amenities of smalltown living. Furthermore, the existing buildings and other improvements are, from an economic point of view, sunk capital. This means that such past investments continue to provide benefits to society at less further cost. Such investments include not only public facilities such as the school, library, post office, roadways, etc., but also the houses and business structures that cannot readily be moved elsewhere.

According to comments by business leaders in the Pahoa community, residents of nearby subdivisions (primarily Kahakai) are not as deeply involved in the Pahoa community structure as are the town residents themselves. Although their children may attend Pahoa High and Elementary School, and they may purchase some items in the town for the sake of convenience, their perception of their community is more diverse than that of the town residents. Consequently, the existence of Pahoa is not of central importance to their lives.

D. Land Use

1. Existing Land Use Controls. The County of Hawaii adopted The General Plan, County of Hawaii in December, 1971. The land use allocation for the Pahoa area as designated by the General Plan is provided in Exhibit 6. The alternative corridors are located in lands designated for medium density, low density; lands southeast of the town are designated for alternate urban expansion. Figure 4 identifies the zoning of the Pahoa area, as established by Ordinance No. 111, County of Hawaii. It is noted that the existing route and Alternative C goes through primarily residential and commercial zoned

lands, while Alternative A and E would be located within lands zoned for agriculture.

In conjunction with the General Plan, the Puna Community Development Plan (CDP) is being prepared. The General Plan identifies the principal goals, policies and future courses of actions which provide the guidelines for orderly growth. The Puna CDP is an extension of the County's General Plan, being specific in describing the Puna District's existing conditions, expected growth and identifying actions which should be taken to facilitate an orderly growth. The Puna CDP, is expected to be a comprehensive document and act as a guideline for planning and implementing projects in the Puna District for a 15-year period. The Planning Department, County of Hawaii is the responsible agency in the preparation of the Puna Community Development Plan and has obtained consultants to draft the Puna CDP. The consultants have completed their technical studies and copies of the Draft Puna CDP (for agency and public review and comments) are expected to become available.

2. Relationship of the Proposed Project to the Existing Land Use Policies.

The proposed bypass road/improvement to the existing Keaau-Paho Road is not specifically identified in the General Plan, County of Hawaii. However, it is felt that this proposed improvement is consistent with the following transportation goal and course of action (Puna District) identified in the General Plan:

"Provide a system of thoroughfares and streets for the safe, efficient and comfortable movement of people and goods between and within the various sections of the County."

Course of Action:

"Primary arterial rights-of-way providing access to the district should be increased to 120 feet where they pass through relatively undeveloped lands."

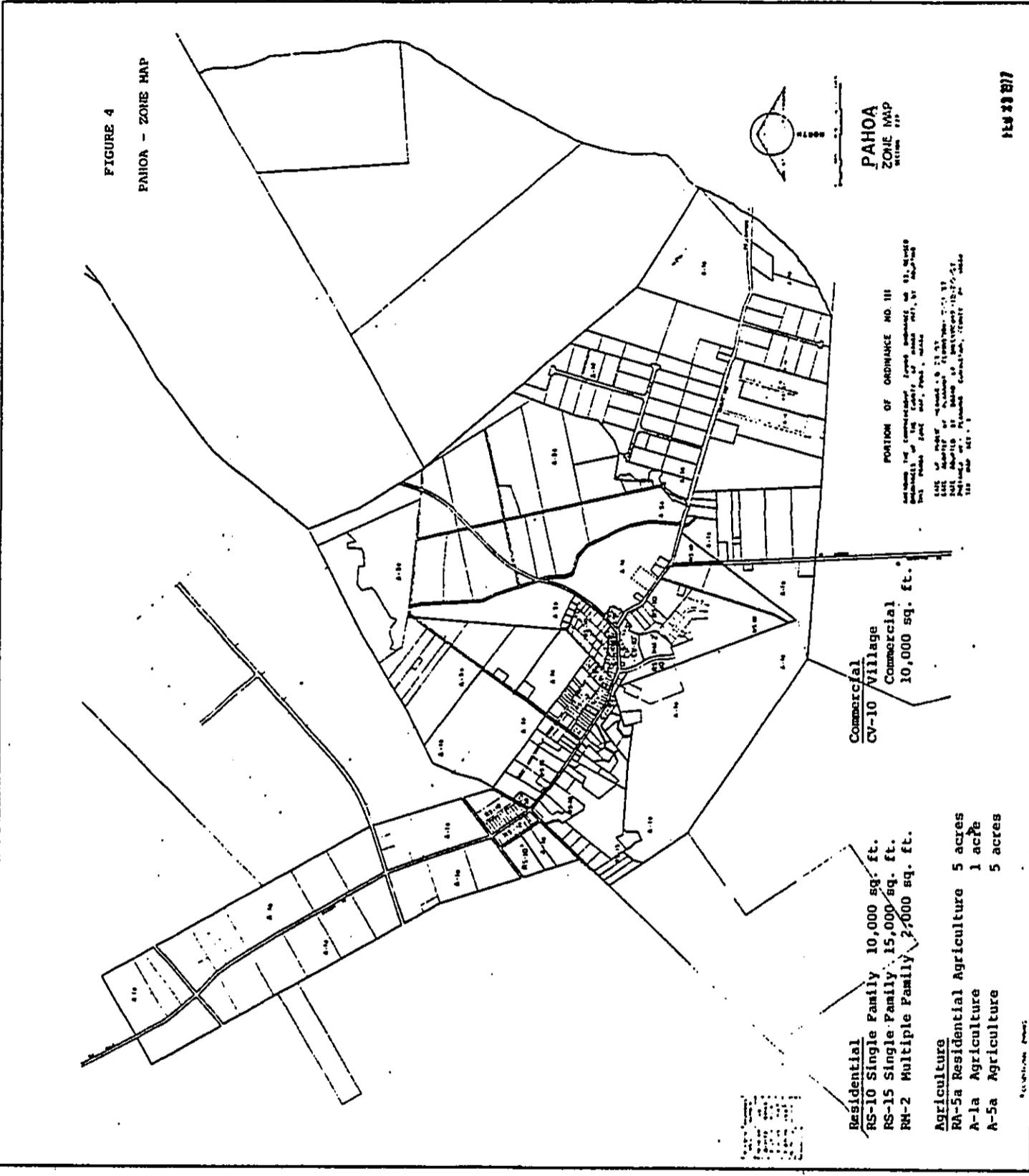
The Planning Department has (by letter of December 9, 1977, see Appendix E) indicated that an amendment to the General Plan would not be required if the proposal is complementary to the goals, policies and applicable standards of the General Plan Transportation element.

Relating to the Draft Puna CDP, preliminary indications are that Alternative A would be generally consistent with the direction of urban growth for Pahoia. In other words, the anticipated growth of Pahoia is expected to take place southeast of Pahoia Village. Therefore, this alternative would be consistent with the planned urban growth. It should be noted, however, that the Puna CDP is in draft form and has not been officially accepted by the County.

It is felt that Alternatives C and E would generally be inconsistent with the Draft Puna CDP insofar that Alternative C would displace a number of existing Pahoia businesses and residences and Alternative E would be southwest of the village where no future urban designations and growth is planned. It should be further emphasized that the predicted growth of Pahoia will be approximately 500 persons within the next 15 years. This growth is not anticipated to be altered by the roadway alignment.

3. Relationship of the Proposed Project to the Statewide Master Plan for Bikeways, 1977 (Bikeplan Hawaii). Bikeplan Hawaii proposes a future bike lane and bike route for Keaau-Pahoia Road and Pahoia-Kalapana Road, respectively. The bike lane will be a portion of the roadway, shoulders, or sidewalk that has been designated for the preferential or exclusive use of bicycles. The bike route for the Pahoia-Kalapana Road will consist of bicycles sharing the roadway with vehicles.

FIGURE 4  
PAHOA - ZONE MAP



PORTION OF ORDINANCE NO. III  
 CONCERNING THE ESTABLISHMENT OF ZONING DISTRICTS IN THE  
 TERRITORY OF HAWAII, AS AMENDED  
 BY ACT NO. 157, LAWS OF HAWAII, 1957  
 AND ACT NO. 157, LAWS OF HAWAII, 1961  
 AS AMENDED BY ACT NO. 157, LAWS OF HAWAII, 1961  
 AND ACT NO. 157, LAWS OF HAWAII, 1961

Commercial  
 CV-10 Village  
 Commercial  
 10,000 sq. ft.

Residential  
 RS-10 Single Family 10,000 sq. ft.  
 RS-15 Single Family 15,000 sq. ft.  
 RN-2 Multiple Family 2,000 sq. ft.

Agriculture  
 RA-5a Residential Agriculture 5 acres  
 A-1a Agriculture 1 acre  
 A-5a Agriculture 5 acres

PAHOA  
 ZONE MAP

114 23 877

#### IV. PROBABLE IMPACT OF THE ACTION ON THE ENVIRONMENT

##### A. Introduction

The Draft EIS was part of an "alternative alignment selection stage" of project planning concerned with selecting the optimum alignment from among the available alternatives based upon a balanced evaluation of the broad social, environmental, economic and engineering factors associated with each alternative. Governmental agencies and the general public provided input to evaluate the alternatives; this was an integral part of the selection process which was actively encouraged throughout this stage of project planning.

This Final Environmental Impact Statement focuses on the recommended alignment. At this stage, an alternative alignment has been selected from the alternatives studied in the Draft EIS. Subsequently, the subsections below discuss the impacts which will occur if the selected alignment is implemented. Both beneficial and adverse impacts are discussed. In order to show the relative impact of the recommended alternative (A1) with the other alternatives (C, E), portions of the subsections provide comparative analysis with the alignment alternatives.

##### B. Topography, Geology and Soils

Alterations to the land surface in the form of cut and fill grading will occur as a result of the construction of the roadway and the installation of required drainage facilities. Preliminary engineering studies indicate that the height of required cuts and fills may vary up to approximately 10 feet. The extent and nature of necessary topographic modifications will be determined during the detailed engineering design phase of the project. In terms of slope stability, all fills under 10 feet in height will be designed with slope ratios varying up to a maximum of 4:1 while fills over 10 feet in height will be designed with slope ratios varying up to a maximum of 2:1.

Preliminary investigation indicates that allowable soil pressures and the bearing capabilities of the underlying geologic structure are adequate to support conventional construction.<sup>1</sup> Slopes designed to the preceding horizontal to vertical ratios will be stable, and no special foundation treatments such as piling or sand-drains are anticipated. Should any adverse geologic or soil conditions be discovered during the detailed design stage of the project, appropriate engineering measures to mitigate the problem will be incorporated into the final design.

Grading operations and the removal of vegetative cover during the construction phase of the project will result in the short-term exposure of the soil to the erosive forces of wind and water.

In order to mitigate the impacts of construction activities in relation to soil erosion, the State Land Transportation Facilities Division will institute appropriate control measures as specified in Section 639 of the State of Hawaii Standard Specifications for Road and Bridge Construction, 1976. Included among the control measures available for use on this project are:

- (1) mulching of slopes during construction.
- (2) installation of temporary and permanent drainage facilities.
- (3) application of limits to the amount of erodable surface area exposed at any one time as a result of grading, excavation, grubbing of vegetation, etc.
- (4) application of water to graded surfaces during construction.

Detailed erosion control measures will be determined and incorporated into the final project design. In addition, the contractor will be required to submit an erosion control plan prior to construction. Unforeseen erosion problems which may arise in the course of construction will be dealt with

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<sup>1</sup> U.S. Department of Agriculture Soil Conservation Service, Soil Survey of the Island of Hawaii, State of Hawaii. Issued December, 1973.

through the design and incorporation of appropriate construction plan modifications.

On completion of construction, all erodable surfaces will be stabilized through landscaping. This activity is for permanent erosion control, and should be differentiated from the temporary measures identified above.

C. Hydrology and Water Quality

As previously indicated, the soils in the project area are highly permeable and the surface runoff is quickly absorbed. Implementation of the proposed action will provide an impermeable, paved road surface. This surfaced area will reduce the amount of precipitation infiltrating into the ground over the roadway alignment. The slight reduction in infiltration caused by paving of the roadway will not adversely affect the groundwater resource.

The recommended alternative A1 will not adversely affect the potable water supply; it is not in the vicinity of a potable water supply source.

During the Draft EIS review period, the Department of Water Supply, County of Hawaii (February 3, 1978) commented that the proposed by-pass will cause minor relocations of their existing facilities (e.g. pipelines, fire hydrants) depending on which alternate route is selected and its design. This relocation of facilities will be verified upon submittal of construction plans to their Department for review and approval.

Possible sources of water quality degradation resulting from construction and use of the selected alignment include:

- (1) exposed soil on graded slopes cleared of ground cover and susceptible to the erosional effects of storm water runoff.
- (2) oil, gasoline and other chemical residues gradually deposited or accidentally spilled on the roadway surface by construction equipment or motor vehicles.

The potential effects of these pollutant sources on water quality will be minimized through the application of appropriate construction techniques and design features. The general provisions contained in the State of Hawaii Standard Specifications for Road and Bridge Construction, 1976 (Section 107.17 - "Protection of rivers, streams, impoundments, forests, and archaeological and palentological findings", Section 639 - "Temporary project water pollution control" and Section 641 - "Hydromulch Seeding") are applicable to the proposed project.

Design measures necessary to provide adequate water quality protection for this project will be determined and incorporated into the project plan during the detailed design stage of the project. However, the State Land Transportation Facilities Division anticipates that installation of improved drainage facilities, the planting of roadside landscaping, and the application of various slope stabilization techniques during construction, as basic erosion control measures to be implemented as part of the project.

D. Vegetation and Wildlife

The project is not anticipated to significantly or adversely effect the vegetation and wildlife in the Pahoa area. The types of plants to be removed include: sugarcane, some cultivated orchid and truck crops (e.g. anthuriums, vegetables), ohia lehua, guava, morning glory, tree fern and other types of fern, ti plant, lilikoi, koa haole, lantana, Christmas berry trees, and various types of weeds. This type of vegetation is typical of the Puna District; as such the removal of these plants will not likely have an significant impact. There will be disturbances and alterations to the environment along the alignment selected, and construction is likely to result in the migration of mammals and avifauna during the short-term period. Once the roadway is established and in operation, partial revegetation (via natural processes) will occur. In some instrances, the habitat of the avifauna (e.g. trees) will be destroyed, however, ample open areas are available for birds to find suitable nests. The nesting

areas of mammals could also be destroyed; these mammals are considered pests and the destruction of their habitat and these mammals themselves is not considered to be significant. The flora would also be cleared, but again in this case, the abundance or similar flora and the common nature of the vegetation would not be considered significant. In accordance with the Endangered Species Act of 1973 (Public Law 93-205), the Fish and Wildlife Service, Department of the Interior has issued two lists of endangered plants and wildlife. These lists were published in the Federal Register, of Wednesday, June 16, 1976, "Department of the Interior, Fish and Wildlife Service - Endangered and Threatened Species - Plants," and the Federal Register, of Thursday, July 14, 1977, "Department of the Interior, Fish and Wildlife Service - Endangered and Threatened Wildlife and Plants (Re-publication of List of Species)". A review of both these lists showed that none of the plants, mammals, and birds mentioned above are identified on this list.

E. Natural Hazards

There will always be a probability that an earthquake or lava flow may affect the recommended alignment. This is the nature of the Pahoa area and in that respect, unavoidable. Barriers to protect the roadway or the area are economically unfeasible.

F. Relocation Impacts

As discussed in the report, "Conceptual Relocation Program Plan, Keaau-Pahoa Bypass Road, Project No. 130AB-01-76 and Pahoa-Kalapana Road Improvement,"<sup>1</sup> (see Appendix I) the recommended alternative involves the whole or partial-taking of twenty-three (23) parcels of land. Twenty-two (22) parcels are zoned for agriculture and one parcel is zoned single family residential.

The report states:

"This alignment is anticipated to displace two (2) residences,

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<sup>1</sup> Dated July 28, 1977. Prepared by the Land Transportation Facilities Division, Right-of-Way Branch.

presumed to be tenant-occupant families, on the near outskirts of the town.

The displacees will be required to relocate to the limited rental units available in the various subdivisions discussed in Alternate A. The presently available rental units are located about one mile or four (4) miles from their present dwellings with rental rates from \$225 - \$285 per month.

Inasmuch as rental and family income was not obtained, a determination on whether or not the displaced tenants can relocate to replacement dwellings within their financial means and within the limits of the rental replacement housing supplement cannot be accurately discussed. However, if monetary or housing problems are encountered at the time of relocation, last resort housing measures, as later explained, can be proposed and implemented to successfully relocate these displacees.

It is therefore not anticipated that selections of Sub-Alternate A1 will cause relocation problems that cannot be solved."

Household displacement can be very upsetting to the individuals involved, but past experience<sup>1,2</sup> shows that: (1) such displacement seldom leads to a change in employment; (2) the new place of residence is frequently of better quality than the one displaced, since the household often combines part of its personal funds with the compensation paid by government in order to acquire another residence; (3) the displacement may often trigger a major change in location or tenure (owning versus renting) that had been considered but not yet acted upon; (4) shopping and community participation patterns seldom change as the result of relocation. Table 3 compares the range of household displacement impacts, ranging from none for E1 to 18 for Alternative C which would upgrade the existing route.

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<sup>1</sup> U.S. Department of Transportation, Social and Economic Effects of Highways, Federal Highway Administration, Washington D.C., 1974.

<sup>2</sup> \_\_\_\_\_, Economic and Social Effects of Highways, Federal Highway Administration, Washington D.C., 1972.

TABLE 3  
DISPLACEMENT EFFECTS

<u>Alternative</u>	<u>Households</u>	<u>Businesses</u>	<u>Annual Agricultural Production in \$</u>
A	3	0	\$10,700
A1	2	0	15,000
E	1	0	3,600
E1	0	0	3,600
C	18	7*	--

\*Three of these would likely be re-faced rather than moved. Alternative C would also displace a church building. Also, Alternatives A and C would have a temporary impact on a small macadamia nut storage facility. Also, not included is a property rental firm presently leasing to some of the impacted businesses. The number for businesses excludes agricultural production.

G. Socioeconomic Impacts

1. Impact on Travel. Users of these alternative routes will be influenced in their travel decisions by the time and distances involved. If they are able to lower their time, which has a dollar value to them, and their automotive operating costs, they are likely to travel more frequently. Such savings may also attract other travelers who might not have otherwise traveled along the route. Decisions such as these have repercussive effects on land values and business sales that may be locationally far removed from the actual highway improvements.

The socioeconomic report (see Appendix D, page D-1) compared the three alternatives in terms of travel time saved. It was determined that Alternative A (makai route) offered the most time savings, Alternative E (mauka route) the second most in time travel savings, and Alternative C, third, and no action the least time travel savings. (The comparison was based on a point from the Hilo side of Pahoa village to .7 mile south along Pahoa-Kalapana Road where Alternative E would have intercepted the Pahoa-Kalapana Road.) These time travel savings resulted in proportionate decreases in travel cost.

2. Impact on Businesses. (This subsection does not address dislocation effects.) The major impact on commercial sales will be from the loss of sales to tourists. (A cursory study<sup>1</sup> consisting of 4 hours of visual observations distributed over various 15-minute segments of Pahoa's traffic indicates that rented cars pass through Pahoa about 240 times daily.) Since the residents of the area will continue to be aware of the business activities in Pahoa, there should be only a negligible decline in sales to Pahoa residents. In fact, as the nearby subdivisions continue to fill, sales to local residents

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<sup>1</sup> This study was felt to be sufficient to approximate the number of tourist vehicles traveling through Pahoa.

are likely to increase. Some negative impact may occur as "impulse" purchases decline, since there may be fewer occasions for such transactions. Such effects will be negligible. The by-pass alternatives obviously would have the effect of reducing traffic congestion in the commercial segment of Pahoa. Consequently, it would to some extent be a more appealing shopping place for area residents. The impact of this effect is also considered to be negligible.

The present retail sales in Pahoa to tourists were estimated by a direct survey of existing businesses that had sales of significance to non-residents of the area. The total annual sales to tourists are at present about \$280,000. This level of sales provides 2.6 full time jobs and 2.6 part-time jobs. The household income derived directly from this level of sales amounts to about \$33,000 annually, which converts to a present value of \$324,000 (using a rate of 9 percent and a time period of 25 years). The recommended alignment is likely to cause a loss of the bulk of these sales, jobs, and incomes in the Pahoa area, since tourists will be unlikely to divert through Pahoa when they have the by-pass option.

3. Displacement of Agricultural Activities. Displacement of agricultural activities would occur for the recommended alignment A1, as well as alternatives A, E, and E1, as is also shown in Table 3. Unlike the commercial activities discussed in the previous paragraph, it is necessary to estimate the "multiplier" effects created by this loss of agricultural production. In the case of non-agricultural businesses, existing economic demand will simply be diverted to new businesses in the County or to increases in the sales of existing firms. Consequently, the impact is of uncertain duration and intensity within the Pahoa area, but the slack would likely be taken up elsewhere in the County. However, agricultural production of the type threatened by displacement would ultimately be for out-of-state purchasers who would

TABLE 4

ECONOMIC EFFECTS OF AGRICULTURAL DISPLACEMENT

<u>Effects</u>	<u>Alternative A</u>	<u>Alternative A1</u>	<u>Alternative E or E1</u>
Statewide Sales (Annual)	\$34,370	\$46,700	\$11,560
Agricultural Jobs	.15	.24	.05
Agricultural and Agricultural- Related Jobs	.40	.56	.13
Statewide Jobs	.54	.77	.18
Acreeage in Production	8.60	12.40	2.90
Agricultural Income (Annual)	\$ 2,760	\$ 4,200	\$ 900
Agricultural and Agricultural- Related Income (Annual)	\$ 6,640	\$ 9,170	\$ 2,240
Statewide Income (Annual)	\$ 9,230	\$12,750	\$ 3,110

simply divert their purchases to products from elsewhere than Hawaii. This means that repercussive or "multiplier" effects would be felt in Hawaii's economy beyond the direct effects experienced in the Pahoa area, and that such losses are essentially permanent.

The impacts of losses to agriculture are shown in Table 4. Perhaps the number of jobs and the amounts of income lost on a statewide basis are the most crucial items to consider. The recommended alignment would result in a loss of \$12,750; alternative E or E1 are clearly the least damaging to the agricultural sector of the by-pass routes under consideration, with only a loss of \$3,100 in annual income. However, even with a loss of \$12,750 in annual income, this impact is not of great significance in regards to the project's benefits and other costs.

4. Impact on Prime Agricultural Lands. The proposed project will effect approximately 20,000 square feet of prime agricultural lands, see Exhibit 7, page EXH-10.<sup>1</sup> The State Department of Agriculture has defined "prime agricultural land" as, "Land which has the soil quality, growing season and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods."

The proposed project (the portion of Pahoa-Kalapana Road to be widened and improved) effects a relatively small portion of a parcel of land designated "prime agricultural land." This land is presently used for raising sugar cane and the removal of 20,000 square feet or less is not anticipated to significantly or adversely effect prime agricultural

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1 The 20,000 square feet was based on the assumption that the project would effect 50 feet of lands alongside the roadway (25 feet on each side), or a length of 400 feet as determined by the designated prime agricultural land (see Exhibit 7).

lands nor result in significant reductions in agricultural income for the sugar company (estimated to be approximately \$170 annually).

5. Other Socioeconomic Impacts. A number of other impacts are conceivable. Access to public facilities such as parks, churches and schools is sometimes enhanced by highway construction. The only instance of this clearly occurring is for travel to and from the beach parks near Kalapana. Account of such impacts is taken in the section on Impact on Travel. (Also, Alternative C might possibly infringe on the operation of Pahoa High and Elementary School.)

The site of the potential geothermal power plant would also be served by the proposed project (see Figure 3, page 12 for the location of the present geothermal testing). The tremendous uncertainties concerning the future scope and nature of this facility prevent any assessment of the beneficial impacts of the highway project on it. Alternative C would impact existing telephone and electric power lines. The extent of such impact is not known at this time. Highway construction in some instances threatens to disrupt a community's structure by cutting off a portion from convenient access and interchange with the balance of the community. No such impact is anticipated in this case.

6. Aesthetics. It was concluded that the project would neither enhance nor hinder the present view planes. It is felt that the removal of flora and disruption to the lands within the alternatives will alter the present aesthetic nature of open space. This action will result in a commitment of land, destruction of biological resources, use of construction material and expenditures of labor and energy. Such commitments of lands and resources are unavoidable and for the most part

fairly compensated (e.g. purchase of land, payment for labor). The land and biological resources destroyed will be irretrievable for all practical purposes, however, the commitment of land is negligible in relationship to the total land area. Additionally, the biota are commonly found throughout the Puna District.

7. Benefit/Cost Ratio. The road user benefit analysis for highway improvements is a comparison of annual costs of alternatives. Each alternative is evaluated on the basis of the annual road user costs and the annual cost of improving, maintaining and operating that portion of highway for a selected period of time. The alternatives are then compared arithmetically to express a benefit ratio of the cost differences, i.e. a ratio of the difference in road users costs before and after the improvement to the difference in highway costs before and after the improvement. A ratio of greater than one signifies that a project has merit from a roadway user's viewpoint. Table 5 identifies the benefit/cost ratio of each alternative. See Benefit/Cost Analysis, Appendix K.

TABLE 5

BENEFIT/COST RATIO

<u>Alignment</u>	<u>Benefit/Cost Ratio</u>
Alternative A	1.53
Subalternative A1	1.49
Alternative C	0.62
Alternative E	1.04
Subalternative E1	1.08

(For additional details, refer to the Benefit/Cost Analysis, Appendix K.)

## H. Air Quality

An air quality study was prepared to evaluate the impact of the proposed action. This study is provided in Appendix B.

1. Existing Ambient Air Quality Levels. The nearest State of Hawaii Department of Health air quality monitoring station is located in Hilo about 20 miles northwest of the project site. The Hilo area is far more urbanized than this project site but a summary of air quality measurements for Hilo indicate that all pollutants measured (both maximum and annual average values) are below State ambient air quality standards.
2. Short-Term Particulate Emissions. During the construction phase of the project the pollutant of primary concern will be suspended particulate matter. Emission rates for particulates will vary depending on the amount of cutting, filling, and grading required. Since these activities are costly in terms of time and money as well as air pollutants generated, it is likely that the final route selected will be designed to keep these activities to a minimum.
3. Vehicular Sources of Air Pollution. The primary air pollutants emitted by motor vehicles are carbon monoxide (CO), hydrocarbons (HC), and nitrogen oxides (NO<sub>x</sub>). Of these the hydrocarbons and nitrogen oxides react under the influence of sunlight in the atmosphere to produce photochemical oxidants, or smog. The rate at which these atmospheric reactions occur depends on many factors and it is not now possible to predict expected down-wind concentrations of photochemical oxidants using simple models of atmospheric pollutant dispersion. Carbon monoxide, on the other hand, is relatively stable and several methods of assessing down-wind concentrations of CO using mathematical models have been developed. As it turns out, CO is also the most abun-

dant of the pollutants generated by motor vehicles and a thorough analysis of CO impact provides a very good indicator of the environmental acceptability of any proposed highway project.

4. Methodology Utilized. Following the mandate of the National Environmental Policy Act of 1969, and pursuant policies issued by the U.S. Environmental Protection Agency (EPA) in their Guidelines for Review of Environmental Impact Statements, Volume 1: Highway Projects mathematical analysis of highway air pollution impact should include investigation at two levels: (1) an area-wide (mesoscale) analysis and (2) a highway corridor (microscale) analysis.

Predicted mesoscale emissions in the project area are shown in Table 6.

The microscale carbon monoxide analysis is based on a technique described in EPA's Guidelines for Air Quality Maintenance Planning and Analysis Volume 9: Evaluating Indirect Sources. There are several inherent assumptions in the procedure; these assumptions were based on "worst case" meteorological condition, a high percentage of trucks and 20% of all vehicles operating under "cold start" conditions, etc. It should be emphasized that these conditions are "worst case" conditions and would not normally occur. This analysis was applied to peak hour traffic conditions. Receptor sites were selected to coincide with locations for which traffic forecasts were made (see Appendix B).

The results of the microscale carbon monoxide analysis is provided in Table 7.

5. Probable Air Quality Impact from Vehicular Sources. Air pollution concentrations in the Pahoa area are not expected to exceed any of the State of Hawaii ambient air quality standards through the year 2000 no matter which of the alternatives for this project is undertaken. Even

TABLE 6  
 AVERAGE DAILY MESOSCALE EMISSIONS ANALYSIS FOR PAHOA AREA

Year	Route	V.M.T. <sup>a</sup>	CO		HC		NO <sub>x</sub>	
			Emission Factor (g/V.M.T.)	Total Emissions (kg)	Emission Factor (g/V.M.T.)	Total Emissions (kg)	Emission Factor (g/V.M.T.)	Total Emissions (kg)
1977	Alternative A, C, or E	9360	48.3	452	7.2	67.4	4.6	43.1
1980	Alternative A, C, or E	11140	31.0	345	5.4	60.2	3.6	40.1
1990	Alternative A, C, or E	17100	11.3	193	1.9	32.5	2.0	34.2
2000	Alternative A, C, or E	22980	11.3	260	1.9	43.7	2.0	46.0

average vehicle miles traveled using a 2 mile route length for all alternatives and the following ADT volumes (1977 = 4680, 1980 = 5570, 1990 = 8550, and 2000 = 11490). Two miles were used (versus the 4.4 miles for the total project) because only the route through or by-passing Pahoia was considered. The remaining 2+ miles would consist of a road improvement which would be unchanged in traffic.

VMT calculated from a large scale map of the proposed project area (1 inch = 50 feet).

TABLE 7  
MORNING PEAK HOUR CARBON MONOXIDE CONCENTRATIONS (mg/m<sup>3</sup>) UNDER WORST  
CASE CONDITIONS AT SELECTED RECEPTOR SITES<sup>a</sup>

<u>Receptor Site</u>	<u>Route</u>	<u>Year</u>				<u>State of Hawaii Standard</u>	<u>Federal Standard</u>
		<u>1976</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>		
1	With or Without Bypass	3.4	2.4	2.0	4.8	10	40
2	Bypass	-	1.0	1.0	1.2	10	40
3	With Bypass	-	1.2	1.0	1.4	10	40
	Without Bypass	2.8	3.0	2.6	5.2	10	40
4	With Mauka Bypass	-	2.6	1.8	2.2	10	40
	Without Bypass	6.0	3.0	2.0	2.6	10	40
	With Makai Bypass	-	3.0	2.0	2.6		

<sup>a</sup> See page B-24 for location of receptor sites

the "do nothing" alternative is viable from an air quality standpoint. Based on calculations contained in the report, however, construction of either by-pass route results in lower projected carbon monoxide levels along the Keaau-Pahoa Road through the center of Pahoa Village.

Considering air quality alone, Alternative E would be preferable to the recommended alignment (A1) because the A1 alignment will represent an up-wind source of air pollutants during both construction and operation. However, the projected difference between these two options is slight and the final decision on route alignment should be based on factors other than air quality.

6. Mitigation Measures. Specific mitigation measures that can be employed to minimize the amount of particulates generated by construction activities include watering work areas, use of dust palliatives, restricting the area of operation, paving of construction lanes, disposing of debris by methods other than burning, and, if necessary, curtailing activities during, dry, high wind conditions.

I. Noise Impacts

1. Noise Criterion. The U.S. Department of Transportation recommends  $L_{10} = 70$  dBA for land use category B which includes, among others, residences, schools, and churches. (See the Noise Study in the Appendices, Appendix C, pg. C-1. The U.S. Department of Housing and Urban Development (HUD), on the other hand, classifies an area where the noise level exceeds 65 dBA for more than 8 hours per 24 hour period as "discretionary - normally unacceptable". Of the two criterions, the HUD criterion is more realistic for this study. It would, therefore, influence the conclusions and recommendations reached.

2. Existing Noise. The existing noise level was measured by a hand held meter at eleven sites, 1 through 11 (see Figure 5 and Appendix C). Table 8 shows the noise readings taken on the hand held meters at various distances from the roadway as footnoted on Table 8. A review of Table 8 shows that the existing traffic noise<sup>1</sup> is well below the Department of Transportation's and HUD's noise criterion in all areas. Based on the above criteria, all of Pahoa village, at present, falls into the normally acceptable noise category. However, based on the Department of Education's noise criterion of 55 dBA, the existing noise level inside the east end classrooms of building (A) and building (B) does not comply with DOE's noise criterion.

3. Predicted Future Noise Levels. Predicted future noise levels are provided in Table 9. (Refer to Figure 6, Peak Hour L<sub>50</sub> Noise Level, Year 2000.)

No Bypass Road - Improve the Existing Road. One alternative of the proposed road improvement program is to improve the existing Pahoa Road (Alternative C). A study of Table 9 shows that if no bypass road is constructed, the noise level along Pahoa Road will increase approximately 16 dBA by year 2000. This means that the noise will be over twice as loud as it is today (1977). Numerous complaints can be expected by 1980.

Bypass Alternatives. Construction of a bypass road would, of course, raise the noise level along its path. The level would depend on the speed, number of vehicles and the truck-auto ratio. Table 9 shows the noise level at 100 feet from the center line of the nearest lane. The noise level at 100 feet from the bypass road will not exceed the recommended L<sub>10</sub> = 70 dBA level until the year 2000. This assumes a truck automobile ratio of 11%. If more heavy trucks are routed over the bypass road the noise level would exceed the recommended L<sub>10</sub> = 70 dBA sooner.

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<sup>1</sup>At various distances from the roadway as footnoted on Table 8.

TABLE 8

## PAHOA VILLAGE

AVERAGE NOISE LEVEL MEASUREMENTS IN dBA

1977

LOCATION	1	2	3	4	5	6	7	8	9	10	11
AM L10	59.5	60	57	40.3	55.5	49	47	53	61	61	61
PM L10	61	61	58	53	60	51	43	51	-	-	-
AM L50	47.2	52.5	48.5	38	50.7	44.6	42.5	43.5	51.5	44.5	53.5
PM L50	49.5	51	46	49	53.5	50	41	42	-	-	-

NOTES: Locations #1, 2, 3, & 5 Measurement Distance = 100' from Pahoa Road

Location #11 Measurement Distance = 86' from Pahoa Road

Locations #4, 6 Measurement on Proposed bypass A

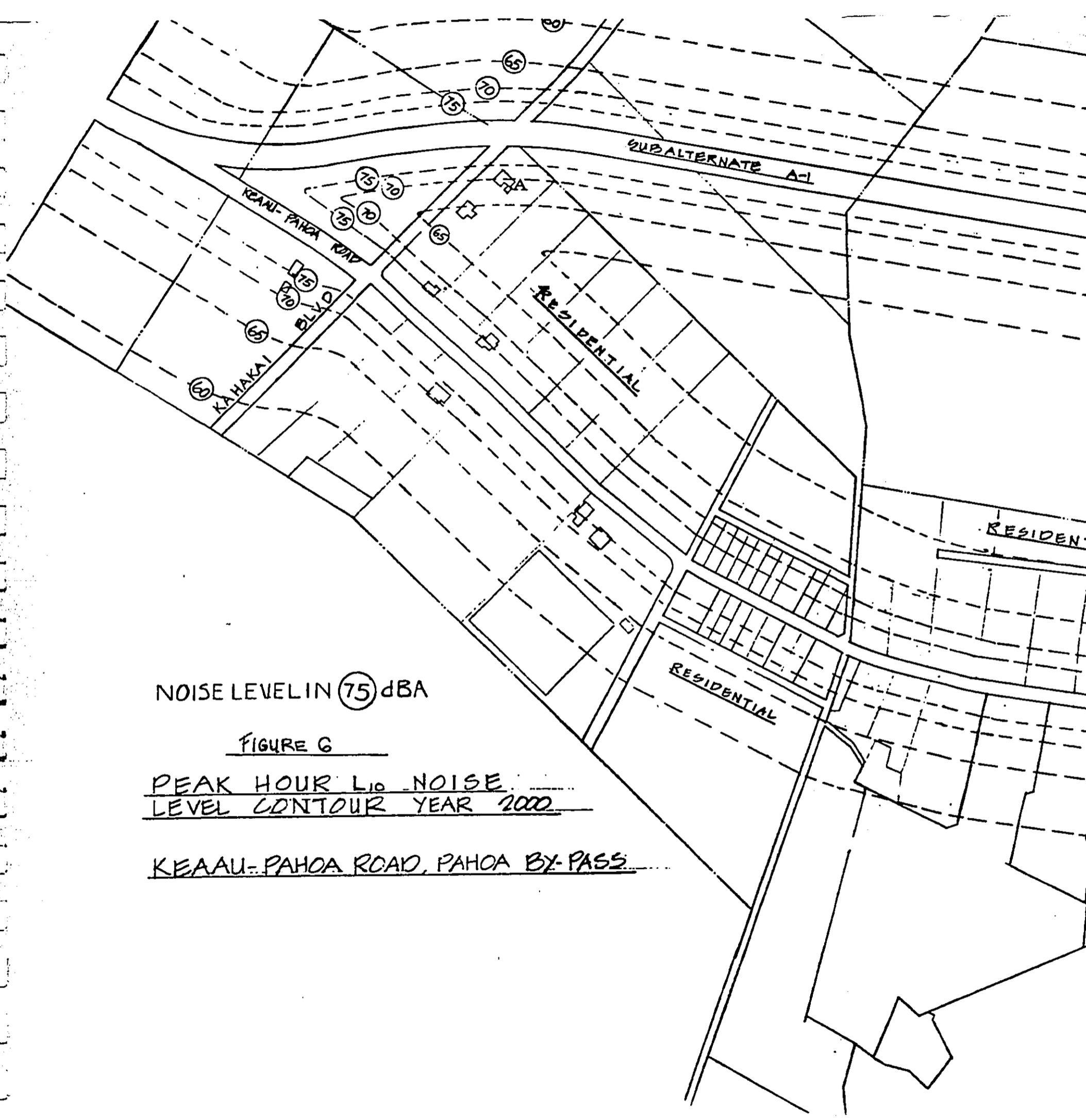
Locations #7,8 Measurement on Proposed bypass E

Locations #9, #10 Measurement on Kalapana Road

AM = 7-12

PM = 1-6



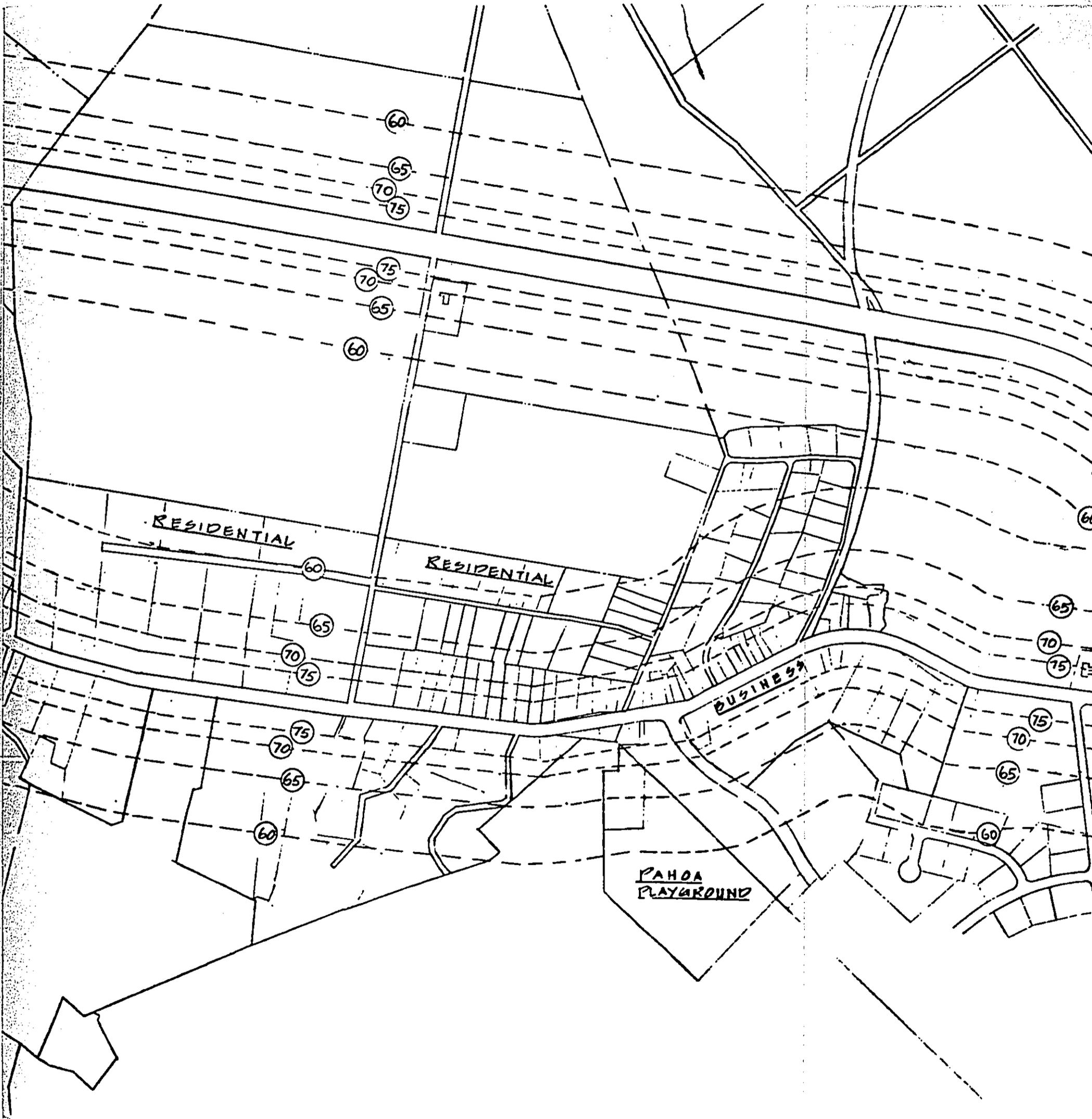


NOISE LEVEL IN (75) dBA

FIGURE G

PEAK HOUR L<sub>10</sub> NOISE  
LEVEL CONTOUR YEAR 2000

KEAAU-PAHOA ROAD, PAHOA BY-PASS



RESIDENTIAL

RESIDENTIAL

BUSINESS

PAHOA  
PLAYGROUND

60

65

70

75

70 75

65

60

60

65

70

75

70 75

65

60

65

70

75

70 75

65

60

FIGURE 6

PEAK HOUR L<sub>10</sub> NOISE LEVEL  
CONTOUR - YEAR 2000

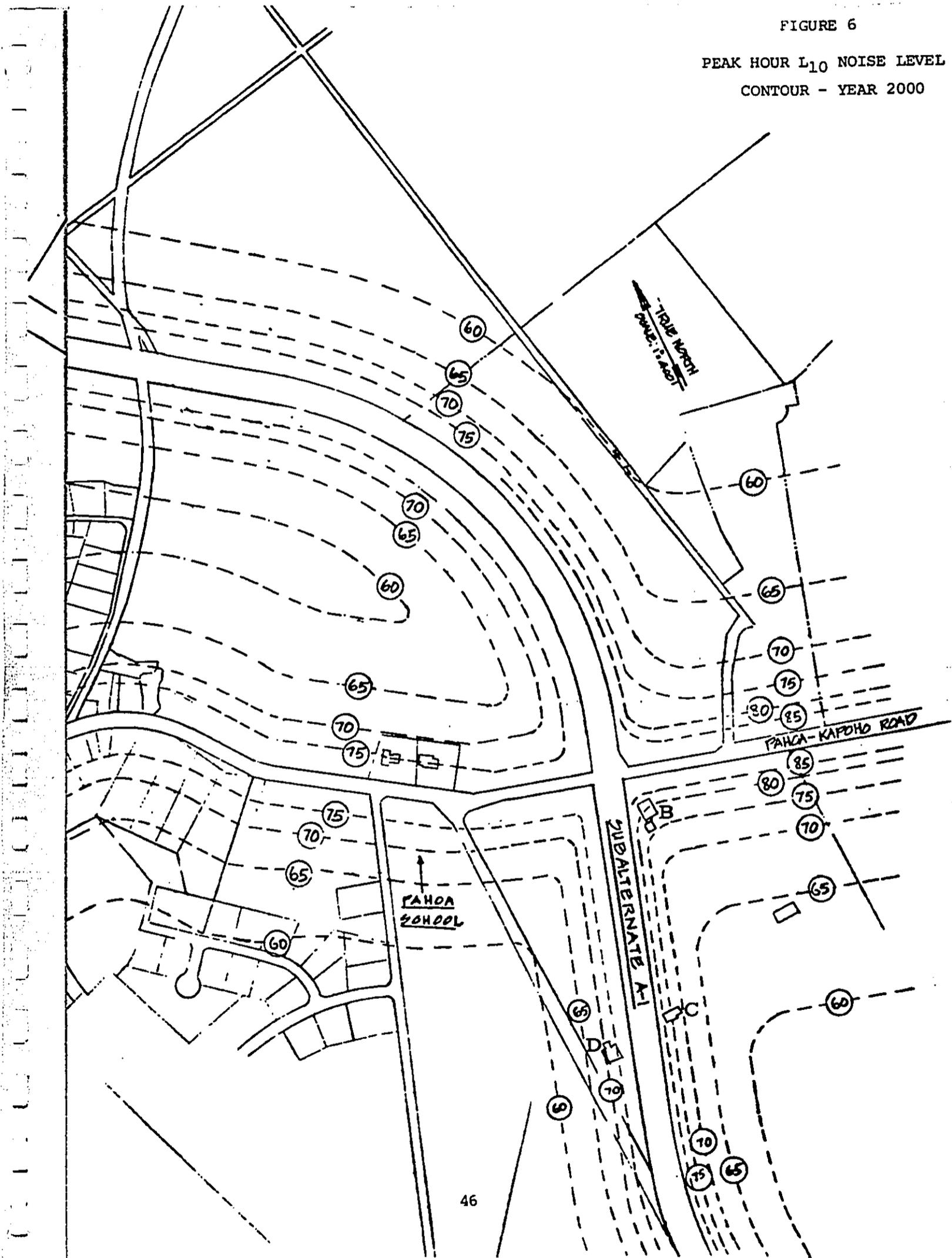


TABLE 9

ESTIMATED TRAFFIC NOISE LEVEL  
100 FEET FROM NEAREST LANE  
KEAAU-PAHOA ROAD, PAHOA BYPASS

Peak Hour Noise Level in dBA

	<u>1980</u>		<u>1990</u>		<u>2000</u>	
	AM	PM	AM	PM	AM	PM
Pahoa Road <sup>1</sup>						
Alternative C						
Auto-L10	57.6	58	58.8	60	60.1	61.4
Truck-L10	69.3	79.6	71.9	77	73.8	74.8
L10	69.6	79.6	72.1	77	74	75
Bypass Alternative <sup>2</sup>						
(A & E)						
Auto-L10	61.1	62.1	62.4	63.7	64	64.9
Truck-L10	64.5	66	67.8	69.2	70.1	71.6
L10	66	67	69	70	71	72
No Action <sup>3</sup>						
Existing Road						
Auto-L10	59.2	59.8	60.7	61.2	61.4	62.1
Truck-L10	72.2	73.4	75	76.3	77	78
L10	72.4	73.6	75	76.4	77	78.1

<sup>1</sup> Based on 30 mph

<sup>2</sup> Based on 45 mph

<sup>3</sup> Based on 30 mph

Simultaneously, the noise level on Pahoa Road would decrease.

Possible Noise Critical Area. If no bypass road is built, all of the existing residences abutting Pahoa Road would become exposed to excessive noise by 1990 even after accounting for the 6 to 9 dBA noise reduction expected from quieter vehicles.

Pahoa High School. The noise level inside the classrooms facing Pahoa Road and Kalapana Road already exceeds the level established by the State Department of Education. Further increase in noise level would make teaching and learning difficult. The noise level is expected to reach an intolerable level in the east half of building A, and in building B by 1990, especially if the Alternative E is selected because all Kapoho traffic must use Kalapana Road or Pahoa Road. The recommended alignment, A1, greatly reduces the noise impact at the school because Kapoho-Kalapana and Kapoho-Hilo traffic will not pass in the near vicinity of the School.

4. Abatement Measures. No noise reduction measures are required if Alternative A is selected as the bypass road. If Alternative E is selected, soundproofing of classrooms in building (A) and (B) should be seriously considered.

5. Residences Affected by the Vehicular Noise. Table 10 identifies the number of residences which will likely be affected by vehicular noise. It should be noted that Alternative C will affect the greatest number of residences and businesses because it goes through Pahoa Town. These homes and businesses are within 100 feet of the nearest lane and would number over 30+.

6. Construction Noise. Short-term noise will increase in the immediate vicinity of the proposed action due to the operation of construction equipment. Because of the physical separation of the by-pass alternatives

from urban development, noise associated with construction will have an insignificant impact upon human populations or sensitive land uses.

If Alternative C is selected, however, the noise generated from construction equipment will affect the residences and commercial uses adjacent to the existing road. Such noise would be short-term and may be expected to occur during normal working hours. The specific impact on construction noise for Alternative C has not been evaluated at this time.

7. Reference to Noise Study. A noise study for the proposed action was prepared by Dr. Iwao Miyake. This study contains detailed information and data on the existing noise levels, and evaluation of the future noise levels. This study is incorporated into this EIS as Appendix C.

TABLE 10  
RESIDENCES AFFECTED BY VEHICULAR NOISE<sup>1</sup>

<u>Alternative</u>	<u>Residences Affected by Noise<sup>2</sup></u>
A	3
A <sub>1</sub>	4
C	37+
E	1
E <sub>1</sub>	1

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<sup>1</sup> The level of noise expected, exceeds  $L_{10} = 70$  dBA within 100 feet of the alternative road corridor.

<sup>2</sup> Excludes those residences to be relocated.

8. Corrective Measures. The noise levels predicted for year 2000, and shown on the noise contour map, were based on existing noisy vehicles. On this basis, the noise level at four residences (See Figure 6, houses identified as A, B, C & D)<sup>1</sup> along the sub-alternate A-1 By-pass road would be above the recommended 70dBA level. However, substantial progress has been made by manufacturers of trucks and automobiles in reducing the noise emission of their products. It is estimated that all of the existing noisy vehicles would be replaced by quieter vehicles by year 2000. This should reduce the noise level by 5 to 10 dBA, depending on the truck/automobile ratio. If we assume a 5 dBA reduction in noise in year 2000, the noise levels shown on the contour map should be 5 dBA lower. On this basis the noise levels at two residences only would fall above the recommended value. One is located near the intersection of Kapoho Road and the By-pass Road (see Figure 6, house B). The other is located along the By-pass Road approximately 850 feet south of Kapoho Road (see Figure 6, house C).

The existing noise level at the residence (house B) near the intersection is 70 to 73 dBA. The predicted noise level after allowing for quieter vehicles, is 70 to 74 dBA. There is no change in the noise level. In other words, the construction of the By-pass Road will have little affect on the noise level at the residence.

The existing noise level at the residence farther down the By-pass Road is 59 to 61 dBA (house C). The predicted noise level after correcting for quieter vehicles by year 2000 is 65 to 75 dBA. The increase in noise level over the existing level is approximately 10 dBA. The noise will be twice as loud as it is today.

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<sup>1</sup> House D may be relocated as a result of the proposed realignment. This will be determined upon review of the final alignment.

Although the predicted noise level after correcting for quieter vehicles is not more than 5 dBA above the recommended 70 dBA, corrective measures should be considered. Possible corrective measures include:

1. Erect an eight foot high, 200 foot long barrier wall along the east boundary of the By-pass Road extending 100 feet each way from the center line of the residence.
2. Install window air conditioners where needed.
3. Replace the existing windows with louver windows.

Of the three, window air conditioners are recommended because the savings in cost would be the greatest.

## V. ALTERNATIVES TO THE PROPOSED ACTION

The Draft Environmental Impact Statement discussed the three basic alternative alignments which were studied. This Final Environmental Impact Statement addresses itself principally to the recommended route, A1, for this proposed project. Project studies, comments received from the public and governmental agencies, and public hearing testimonies are the basis for this recommendation.

Alternatives B and D were deleted after preliminary investigations; Alternative C (improvement of the existing road) was deleted following detailed evaluation of this alignment. The reasons for the deletion of Alternative C are provided on pages 65 and 66.

Since the other alternative alignments (A and E) were the by-pass options, the impacts as well as the advantages and disadvantages were similar. However, alternative A had a few significant advantages that alternative E did not have. These include:

1. Elimination of cane haul trucks from the road through Pahoa Town.
2. A more direct route toward Kapoho.
3. No potential for adverse impact on the Pahoa Deep Wells.
4. A higher benefit/cost ratio.
5. Greater community support.

Subalternative A1 is recommended instead of alternative A because:

1. It provides a smoother transition to the existing road.
2. It is more favorable to Pahoa School in terms of traffic noise and safety.

### A. Comparison of Alternatives A, A1, C, and E, E1

These alternatives have been described in Section II, Project Description. Tables 11, 12, and 13 identify the impacts of Alternatives A/A1, C, and E/E1, respectively. It should be noted that the impacts which are quantified, are based on discretionary judgment and explanations are provided if the reasoning for

TABLE 11

SUMMARY OF IMPACTS - ALTERNATIVE A/A1

Environmental Impact	Site Preparation and Construction	Operation/Traffic
1. Landform	-1	0
2. Microclimate	0	0
3. Flora	-1	-1 <sup>b</sup>
4. Fauna	-1	-1 <sup>b</sup>
5. Noise	-1	+1 <sup>c</sup>
6. Air Pollution	-1	0
7. Water Pollution	0	0
8. Erosion	-1	0
9. Hydrology	0	0
10. Aesthetics	-1	+1 <sup>d</sup>
11. Natural Hazards <sup>e</sup>	-1 <sup>f</sup>	-1 <sup>f</sup>
12. Socioeconomic Considerations		
a. Travel Time/Cost	0	+1
b. Business (Loss to)	-1	-2 <sup>g</sup>
c. Urbanization (Secondary)	0	+1 <sup>h</sup>
d. Community Attitude	0	+1 <sup>i</sup>
13. Historical Sites	0	0

NOTES: +1 Impact is foreseen to be beneficial due to increased accessibility, alteration of alignment from a sensitive area, planned improvements.

0 Impact is expected to remain the same as the present conditions.

-1 Minor Negative Impact is foreseen, e.g. dust, noise, traffic congestion especially as it relates to the short-term site preparation and construction period.

-2 Major negative impact is foreseen, e.g. loss of monies from tourists (merchandise sales), violation of applicable environmental standards.

ALTERNATIVE A/A1 (MAKAI BYPASS ALTERNATIVE)

Footnote	Explanation
a	During the initial planning, site surveys and field visits incur some damage or disturb the landform, flora, and fauna. For example, the engineering survey team is likely to disturb the flora and fauna with their vehicles and the necessity of clearing vegetation to do their survey.
b	Concern here is shown for animals which are periodically run over by vehicles. Also, this alternative would open up new areas and there always is the potential that travelers may stop along the road and "pick" a few flowers or possibly remove plants.
c	This impact is foreseen as being beneficial because the noise will be removed away from the receptors (Pahoa Village).
d	The benefit derived from this alternative is that the road will benefit the appearance of the village by not congesting the existing road.
e	In this particular case the impact is on the roadway due to the existing volcanic hazards.
f	Because there is a higher potential that volcanic eruptions may occur, there will also be a higher probability that this alternative would be affected. The rating of -1 is based on the probability of the roadway being covered by lava (a limited probability) and the effects of volcanic activity (e.g. smoke, odors).
g	The bypass alternatives will result in a substantial loss of business (i.e. selling of merchandise to tourists) due to the anticipated rerouting of travelers.
h	The consultant for the Puna Community Development Plan has indicated that the makai route is consistent with the future, planned urban growth of Pahoa.
i	The community through an informational meeting appears to support the makai alignment. Several governmental and private agencies also support the makai alignment: (1) Puna Sugar Company, Limited (February 2, 1978) indicated: "Puna Sugar Co., Ltd. is definitely in favor of a makai bypass road, i.e. alternate A or subalternate A-1 . . ."

(2) Department of Public Works, County of Hawaii (February 7, 1978) concluded: "For the reasons stated above Alternate A or Subalternate A-1 based on geometric, would be favorable over Alternate E or Subalternate E-1."



TABLE 12

SUMMARY OF IMPACTS - ALTERNATIVE C

Environmental Impact	Site Preparation and Construction		Operation/Traffic
1. Landform	-1	0	0
2. Microclimate	0	0	0
3. Flora	-1	0	0
4. Fauna	-1a	-1a	-1a
5. Noise	-1	-2b	-2b
6. Air Pollution	-1	-1c	-1c
7. Water Pollution	0	0	0
8. Erosion	-1	0	0
9. Hydrology	0	0	0
10. Aesthetics	-1	-1d	-1d
11. Natural Hazards <sup>e</sup>	-1f	-1f	-1f
12. Socioeconomic Considerations			
a. Travel Time/Cost	-1g	-1g	-1g
b. Business (Loss to)	-2	-2	-2
c. Urbanization (Secondary)	0	0	0
d. Community Attitudes	0	0	0
13. Historical Sites	-2	-2	-2

RATINGS: +1 Impact is foreseen to be beneficial due to increased accessibility, alteration of alignment from a sensitive area, planned improvements.

0 Impact is expected to remain the same as the present conditions.

-1 Minor Negative Impact is foreseen, e.g. dust, noise, traffic congestion especially as it relates to the short-term site preparation and construction period.

-2 Major negative impact is foreseen, e.g. loss of monies from tourists (merchandise sales), violation of applicable environmental standards.

ALTERNATIVE C (IMPROVEMENT OF THE EXISTING ROAD)

Footnote	Explanation
a	Concern here is shown for animals which are periodically run over by vehicles. Also, this alternative would open up new areas and there always is the potential that travelers may stop along the road and "pick" a few flowers or possibly remove plants.
b	As indicated in Section III.B.3. Noise, this alternative will result in traffic continuing to go through Pahoa Village. With the increase projected (if no bypass is built) the noise projected will increase.
c	Air pollutants will be indirectly generated by the proposed action through vehicles. This rating was given on the basis that the pollutants will increase and will be located the closest (of all alternatives) to the receptors (Pahoa Village).
d	The improved roadway will displace and go through Pahoa's commercial area. It is felt that this would not enhance the present atmosphere of the commercial area.
e	In this particular case the impact is on the roadway due to the existing circumstances.
f	Because there is a higher potential that volcanic eruptions may occur, there will also be a higher probability that this alternative would be affected. The rating of -1 is based on the probability of the roadway being covered by lava (a limited probability) and the effects of volcanic activity (e.g. smoke, odor).
g	This rating is due to the temporary roadway construction which will disrupt the normal flow of traffic, and at times will probably result in the use of one lane for traffic (directed normally by a flag man).
h	In the long-term use of the roadway, traffic costs will increase based on the speed and need to go through the Village. Those travelers whose destination is Kalapana (or in that direction) will reflect the greatest loss (travel time and cost).
i	During the information meeting, it was felt that the individuals at the meeting were resolved to the fact that there should be a bypass, and that the existing road presented problems in terms of congestion, traffic, and safety. Additionally, several agencies provided letters expressing that Alternate C was undesirable.

TABLE 13

SUMMARY OF IMPACTS - ALTERNATIVE E/E1

Environmental Impact	Site Preparation and Construction	Operation/Traffic
1. Land form	-1 <sup>a</sup>	0
2. Microclimate	0	0
3. Flora	-1	-1 <sup>b</sup>
4. Fauna	-1	-1 <sup>b</sup>
5. Noise	-1	+1 <sup>c</sup>
6. Air Pollution	-1	+1
7. Water Pollution	0	0
8. Erosion	-1	0
9. Hydrology	0	-1 <sup>d</sup>
10. Aesthetics	-1	+1 <sup>e</sup>
11. Natural Hazards <sup>f</sup>	-1 <sup>g</sup>	-1 <sup>g</sup>
12. Socioeconomic Considerations		
a. Travel Time/Cost	0	-1
b. Business (Loss to)	0	-2 <sup>h</sup>
c. Urbanization (Secondary)	0	-2 <sup>i</sup>
d. Community Attitude	0	-1
13. Historical Sites	0	0

RATINGS: +1 Impact is foreseen to be beneficial due to increased accessibility, alteration of alignment from a sensitive area, planned improvements.

0 Impact is expected to remain the same as the present conditions.

-1 Minor negative impact is foreseen, e.g. dust, noise, traffic congestion especially as it relates to the short-term site preparation and construction period.

-2 Major negative impact is foreseen, e.g. loss of monies from tourists (merchandise sales), violation of applicable environmental standards.

ALTERNATIVE E/E1 (MAUKA BYPASS ALTERNATIVE)

Footnote	Explanation
a	During the initial planning, site surveys and field visits incur some damage or disturb the landform, flora, and fauna. For example, the engineering survey team is likely to disturb the flora and fauna with their vehicles and the necessity of clearing vegetation to do their survey.
b	Concern here is shown for animals which are periodically run over by vehicles. Also, this alternative would open up new areas and there always is the potential that travelers may stop along the road and "pick" a few flowers or possibly remove plants.
c	This impact is foreseen as being beneficial because the noise will be removed away from the receptors (Pahoa Village).
d	There is a potential that the mauka route will affect the potable water supply (as a secondary implication of possible long-term urban growth adjacent to the roadway). See Department of Water Supply's comments, Appendix A, page A-4.
e	The benefit derived from this alternative is that the road will benefit the appearance of the village by not congesting the existing road.
f	In this particular case the impact is on the roadway due to the existing circumstances (volcanic eruptions).
g	Because there is a higher potential that volcanic eruptions may occur, there will also be a higher probability that this alternative would be affected. The rating of -1 is based on the probability of the roadway being covered by lava (a limited probability) and the effects of volcanic activity (e.g. smoke, odor).
h	The bypass alternatives will result in a substantial loss of business (i.e. selling of merchandise to tourists) due to the anticipated re-routing of travelers.
i	The consultant for the Puna Community Development Plan has indicated that future and planned direction of urbanization of makai. Therefore, the mauka route would be opposite this future growth direction.

TABLE 14

ECONOMIC COMPARISONS OF ALTERNATIVES\*

<u>Alternative</u>	<u>Project Cost</u>	<u>Amount of Land (in acres)<sup>1</sup></u>	<u>Loss of Tax Revenues</u>	<u>Agricultural Impact</u>	<u>Businesses Displaced</u>	<u>Residences Displaced</u>
A	\$3,987,950	8.60	\$4,125	\$10,700	2	3
A <sub>1</sub>	\$4,080,250	12.40		\$15,000	0	2
C	\$5,313,350	-0-	\$6,825	-0-	9	18
E	\$4,000,200	2.90	\$3,600	\$ 3,600	0	1
E <sub>1</sub>	\$3,822,850	2.90		\$ 3,600	0	0

56

\*Includes the total (4.4 mile) length.

<sup>1</sup> Agricultural acreage in production.

the rating was felt necessary. The explanations are identified in footnote form.

Table 14 compares Alternatives A, C, and E, with regards to those impacts which have been tabulated so that the quantities shown are based on calculations; for example, field surveys performed by the Rights-of-Way Branch resulted in a preliminary indication of businesses/residences to be displaced, or engineering estimates of project costs.

Table 15 provides for the reviewer, a comparative overview of each alternative based on the various impacts to be experienced after completion of construction. This comparative overview is developed on a cumulative basis where evaluation is based on a specific impact factor on all three alternatives. For example, using Air Pollution Impact on all three alternatives, it is determined that A has a value of -1, C has a value of 0, and E has a value of +1 (see Operational/Traffic column of Air Pollution, Tables 11, 12, and 13). For Table 15, these values are interpreted into 1, 2, and 3, 1 having the least or a beneficial impact, 2 having the second least impact, and so on. The value given for the above would then be as follows: A = 3, C = 2, and E = 1. Thus, these point values would be totalled for each environmental impact factor and the alternative with the lowest total points would be considered the most desirable from an environmental point of view. When the ratings (for Tables 11, 12, 13) were equal, the same number was assigned to it (see item 11. Natural Hazards, Table 15).

In total, these five (5) tables provide in a brief form the individual and cumulative probable impacts foreseen in evaluating these alternative alignments. These tables are based on the information presently available and relate to the narrative on impacts discussed in Section IV, "The Probable Impact on the Proposed Action on the Environment" and sub-section B, below. It should be noted that additional comments were received and revisions were made and incorporated into this final EIS document.

TABLE 15

## SUMMARY OF IMPACTS - ALL ALTERNATIVES

Based on a 1, 2, 3 rating system for long-term or operational impacts.

Environmental Impact	Alternatives		
	A/A1	C	E/E1
1. Landform	1	1	1
2. Microclimate	1	1	1
3. Flora	2	1	2
4. Fauna	2	2	2
5. Noise	1	3	1
6. Air Pollution	2	3	1
7. Water Pollution	1	1	1
8. Erosion	1	1	1
9. Hydrology	1	1	2
10. Aesthetics	1	3	1
11. Natural Hazards	2	2	2
12. Socioeconomic Considerations			
a. Travel Time/Costs	1	3	3
b. Business (Loss to)	3	3	3
c. Urbanization (Secondary)	1	2	3
d. Community Attitude	1	2	3
13. Historical Sites	1	3	1
14. Businesses and Residences Displaced	2	3	1
15. Loss of Tax Revenue	2	3	1
16. Agricultural Impact	<u>3</u>	<u>1</u>	<u>2</u>
TOTAL	29	39	32

Alternative A/A1 will likely have the least adverse environmental impact (29).  
Alternative E/E1 will have a slightly (32) greater environmental impact.  
Alternative C will have the greatest (39) environmental impact.

B. Probable Environmental Impact

1. Alternative A. The most significant long-term environmental effect will be the loss of monies from the tourists presently traveling through Pahoa. If a by-pass alternative (Alternative A or E) is recommended, both will divert a large majority of the travelers along the by-pass route. As indicated, the total annual sales to tourist are at present about \$280,000. The by-pass alternatives will cause a loss of the bulk of these sales (equivalent to 2.6 full-time and 2.6 part-time jobs), and incomes in the Pahoa area.

There will be disturbances to the flora and fauna adjacent to the roadway. As identified in Table 11, travelers periodically run over animals (dogs, cats, mongooses, birds), additionally, a few travelers are likely to remove plants which are adjacent to the roadway. Although these impacts are normal (for the Puna District), they should not go unstated.

The impact of alternative A and subalternative A1 on existing telephone poleline facilities was described by Hawaiian Telephone Company (February 21, 1978) as:

"Alternate A and Subalternate A-1 could force the relocation of 1/2 mile and 3/4 mile respectively of existing telephone poleline facilities along the Pahoa-Kalapana Road."

All three alternatives as well as the existing road is within a high potential impact area for volcanic hazards. The location of this alternative is unavoidable, and the risks of settlement, facilities, and investments in the Pahoa area are established, thereby making a road system necessary to serve the population.

It should also be noted that during the consultation period, the Draft EIS review period, and testimonies provided during the Public Hearing, alternative

A or subalternative A1 was supported by several individuals, business groups, and governmental agencies.

2. Alternative C. Again the most significant impact foreseen is on businesses in Pahoa Village. The widening of the existing road will result in the displacement of approximately 18 businesses and the removal of many walls, portions of front yards, and driveways which presently front the existing road. The re-establishment of these businesses is possible, but in many cases, doubtful. The remaining businesses will likely be affected by the traffic (e.g. noise, air pollution, construction) along an improved Pahoa Road.

Secondly, the Pahoa Commercial District which is identified by the State as a historical district will be affected. Several buildings in the commercial area identified as being historical structures, will be removed. Their relocation would be infeasible. It should be noted that the State Historic Preservation Officer in a letter dated February 17, 1978, concurred with the decision to eliminate alternative "C" as a viable route.

The closeness of Alternative C to Pahoa Town will result in undesirable aesthetics, air pollution, and noise. These environmental quality concerns are felt to be significant, and in total, would have a significant adverse impact on the community.

As stated for alternative A, the volcanic hazards are unavoidable due to the location of the project.

The impact on fauna is primarily in the probability of more dogs and cats in the vicinity of the Village will run over than if the by-pass alternatives are recommended.

The impact of alternative C on existing telephone poleline facilities was described by Hawaiian Telephone Company (February 21, 1978) as:

"Alternate C will force a major relocation of our facilities through Pahoa Town and along the Pahoa-Kalapana Road. Because of the magnitude of this poleline relocation and the need to use non-stock telephone cables which require order to delivery lead times ranging from six to eight months, we will require a minimum of 18 months to budget for, order material, engineer and complete the relocation."

In general, it was found that Alternative C is the most undesirable of all three alternatives because of the number of unavoidable impacts are greater in number and magnitude. Additionally, travel time/costs and relocation costs will be much higher for Alternative C, than A or E.

3. Alternative E. The most significant long-term environmental effect will be the loss of some of the tourist purchases in Pahoa (as in Alternative A). This effect has been discussed in item 1 in this section.

Similarly, the flora and fauna will be disturbed. As pointed out above, the lands adjacent to the roadway will likely be disturbed in form of fauna being displaced (because of vehicular noise, the presence of humans) and the potential of plants being removed.

The potable water supply may also be adversely affected as a secondary, indirect result of the project. The roadway may in the long-term act as a catalyst for urbanization; this urbanization in turn may affect the potable water sources presently located above Pahoa Village. It is felt that a mitigation measure to this impact may be the use of zoning to control urbanization of this area. (This measure, however, lies beyond the

scope and authority of the State Department of Transportation.)

Travel time/cost is also considered to have an adverse impact. This is based on the need for travelers (whose destination is Kapoho or back to Pahoa) to come back southeast to the junction of Pahoa-Kapoho Road and Pahoa-Kalapana Road. This need for "back-tracking" will also result in additional noise being generated and thus affecting the Pahoa High and Elementary School.

Urbanization along the southwest route was also considered a probability. The present land use plans<sup>1</sup> for Pahoa foresee the direction of growth being northeast of the existing town. The southwest alignment will be away from the direction of growth, making this alternative incompatible with the land use plans. As stated above, to prevent urbanization along this alternative by-pass road, zoning controls can be established. However, it is beyond the scope and authority of the State Department of Transportation to establish zoning controls. (See Figure 4, page 23, and Exhibit 6, page Exh.9).

The impact of alternative E on existing telephone poleline facilities was described by Hawaiian Telephone Company (February 21, 1978) as: "Alternate E will have the least effect on existing telephone poleline facilities."

The Department of Accounting and General Services, State of Hawaii (March 7, 1978) stated that: "We favor subalternate A-1 over Alternative A to minimize potential noise along Kalapana Road adjacent to the school."

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<sup>1</sup> As indicated in the General Plan for the County of Hawaii, January, 1971.

In general, there appear to be several areas of adverse environmental impacts which are unavoidable. In comparison to the other two alternatives, Alternatives A/A1 were found to be the least environmentally damaging; E/E1 second in being damaging to the environment; and C most damaging to the environment.

C. No Action Alternative

It is felt that this alternative would be more undesirable than Alternative C. Although no displacement (of businesses or residences) will occur, the travel time and costs will be greater, pedestrian safety will likely be decreased, and congestion through the village will increase with the predicted traffic projection. The present condition of the roadway will also continue to deteriorate and maintenance would be expected to increase. Moreover, the noise levels will increase in proportion to the increase in vehicles, projected calculations of noise indicates that this long-term increase will adversely affect the educational environment of Pahoa High and Elementary School.

If a by-pass alternative is selected, the existing road will continue to be in use as a secondary road. Traffic along the existing road is then expected to decrease. Based on the undesirability of utilizing the existing road for the future, larger volume demands, and especially considering the condition and closeness of the road to Pahoa Village and many residences, the no action alternative is felt to have a greater, more negative impact than those (Alternatives A, C, and E) being considered.

D. By-Pass Design Alternatives

Presently, the subalternatives for the by-pass are being reviewed by the State Land Transportation Facilities Division for possible modifications which will avoid displacement of residents or businesses. These modifications generally occur at the beginning and termini of the bypass alternative. The following

modifications are being evaluated:

1. Attempt to avoid interference with Kahakai Boulevard by moving the beginning of the project east of Kahakai Boulevard. As pointed out by the Planning Department, County of Hawaii, Kahakai Boulevard is a heavily traveled roadway, serving as the principal access to over 500 homes.
2. Adjusting the alignment (in the vicinity of the Pahoa-Kalapana Road and Pahoa-Kapoho Road junction, to avoid loss of residences and improve the junction for a smoother flow of traffic.

At this time no decision has been made regarding these modifications.

E. Legislative Restrictions and Mass Transit Alternatives

Legislative restrictions such as land use controls or moratoriums on building activity could be imposed to stop development in the project area. Such restrictions would revise existing zoning ordinances and would constrain free market demand for housing to prevent continued population growth and consequent increases in transportation needs. Legislative controls such as restrictive driver licensing, car pools, limiting vehicle size and specifying permissible operating hours, could also be implemented. Although these legislative restrictions are possible, they are subject to social acceptability and possible legal action. This alternative is not a practical solution in terms of the Statewide scope of the action and the time involved for project implementation.

Mass transit would not satisfy the primary need for the proposed action (i.e. the inadequacy of the road). In fact, a mass transit system would:

- (1) increase vehicular noise, (2) cause greater wear and tear on the road; and

(3) may be a greater accident risk along the present road. Other factors detracting from a mass transit alternative includes: (1) the high operational cost (based on low ridership); and (2) the rural lifestyle and use of the individually owned automobile for commuting.

F. Deletion of Alternative C

Investigations and evaluations indicate that Alternative "C", Improvement of the Existing Road through Pahoa Town, is not a viable alternative.

The reasons for deleting Alternative "C" are as follows:

1. General. The current (1976) and projected average daily traffic through Pahoa Town are as follows:

<u>1976</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
3,300	5,600	8,600	11,500

Alternative "C" would continue to route all traffic through Pahoa Town along a limited right-of-way. Therefore, much of the problems associated with the present roadway would remain and these problems would worsen as the traffic volume increases.

2. Traffic Congestion. Traffic movement through town are restricted by numerous driveways to residences, by on-street parking, access to off-street parking, pedestrian crossings, etc. By the year 2000, the expected peak hour traffic is about 1,000 vehicles of which about 11% would be trucks and buses. At this peak hour volume, temporary stoppages with unstable flow can be expected.
3. Safety. The accident rate on Keaau-Pahoa Road through Pahoa Town is considerably higher than the surrounding area. The rates for the years 1973, 1974 and 1975 were 8.91, 9.94 and 5.74 accidents per million miles, respectively, as compared to the 1975 island-wide rate of 2.23 and the statewide rate of 2.16. Roadway improvement should lessen this accident rate because of improved sight

distances and wider travel way. However, bypassing of the through traffic around Pahoa Town should make the roadway much safer for the pedestrians and the local traffic.

4. Noise. Reference is made to the noise study prepared by Dr. Iwao Miyake. The current (1976) noise level at most residences and businesses along the existing road in Pahoa Town exceeds the U.S. Department of Transportation's recommended sound criterion,  $L_{10} = 70$  dBA. By 2000, if no bypass is provided, the recommended sound criterion would be exceeded by as much as 15 dBA. This means that the noise will be over twice as loud (nearly 3 times) as the maximum recommended noise level.

At Pahoa School, the present peak hour noise levels in the classrooms facing the roads exceed acceptable standards. As the traffic increases, the sound levels would also increase and such increase would make teaching and learning difficult.

5. Displacement. Alternate "C" will displace eighteen (18) residences, nine (9) businesses, and one (1) church; whereas, the bypass alternatives would displace a maximum of three (3) residences and two (2) businesses. Alternate "A" would remove some land from sugarcane cultivation; however, Puna Sugar Company has indicated that this is acceptable to them.
6. Historic and Commercial District. Alternative "C" passes through the Pahoa Historic and Commercial District, Hawaii Island Site No. 7388, and would have a significant adverse impact on this site. This alternative would result in modification and/or removal of approximately 18 structures within the village, many of which are included in the historic complex.



VI. PROBABLE UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Implementation of the proposed project will result in the loss of agricultural lands. The increase in vehicular traffic will increase the noise above the acceptable noise levels in certain areas. Other impacts are either insignificant or can be mitigated to acceptable levels. The project will not result in water pollution, damage to natural life systems, threats to health, undesirable land use patterns or adverse effects on minorities. Soil erosion and dust generated during and after construction will be mitigated by immediate erosion control measures and by permanent plantings. Automobile emissions will not exceed acceptable levels.

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

The short-term losses will include the displacement of residences, loss of lands in agricultural use, loss of open space, removal and disturbances to the biological communities within the corridor, generation of dust, noise, traffic disruption, greater potential for erosion, and the use of materials and resources (for the construction of the road).

These short-term losses, however, are felt to be offset by the long-term benefits of the proposed action. Naturally, these benefits will differ in magnitude depending on the alternative corridor selected. The benefits attributable to the bypass alternatives (A and E) and the alternative to improve the existing road (C) are discussed below.

The project's impact on pedestrian and driver safety is undetermined, but should a bypass alternative be selected, the reduction of automobiles going through Pahoa Village will likely reduce accidents and traffic congestion. A bypass route would also reduce noise and air pollutants in Pahoa Village because the road would be relatively removed from the village. The bypass alternatives, however, will result in more lands being taken out of agriculture and open space, and committed to a roadway use.

Alternative C will result in the relocation of many homes and businesses. Traffic through Pahoa Village will increase the potential for pedestrian and driver accidents. Additionally, the historical town district of Pahoa will be affected. In total, Alternative C has the greatest number of adverse impacts.

For the most part, long-term benefits which will accrue to the proposed action (no matter which alternative corridor is selected) will include:

(1) savings in travel time (due primarily to the faster speeds); (2) reduced vehicular operation costs; and (3) improvement over the present road conditions.

It is felt that based on the traffic projections, the project will be able to adequately accommodate the estimated future traffic with improved road conditions and higher travel speeds. These long-term benefits or productivity is expected to continue during the life of the roadway with the assumption that from time to time normal maintenance on the road is provided.

Presently the rate of growth of the Pahoa area is slow, although an increase in population is expected. The consultants for the Puna CDP have projected a growth of 500 persons over the next 15 years for Pahoa. This growth is 50% greater than the present population of 1,000. It is not anticipated that the alternative alignment selected will significantly encourage urbanization or alter land use patterns in the area. The distance from Hilo, the existing land use designations and zoning, the cost of land and land development, and the availability of other, more desirable lands in other areas of the County are the primary factors for Pahoa will probably remain a small rural/suburban area in the immediate and long-term future.

VIII. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

It is anticipated that the proposed action will commit the necessary construction materials, land, and human resources. For the most part, these resources are irretrievable.

Construction materials in form of asphaltic concrete, rock, sand, concrete, wood, steel, etc., will be consumed in constructing the roadway. These materials are readily available and will not constitute a significant depletion of a valuable resource. Once utilized, these materials will not be reused or recycled.

Land will also be committed to a public use. Depending on the alternative corridor selected, between 18 and 40 acres of land will be required. This land is presently in an open space (Alternatives E and A), agricultural (Alternatives A and E), or urban use (Alternative C). Once in public use, the land can be considered committed to that use on a long-term basis.

Human resources in form of labor (e.g. planning, designing, engineering, construction labor, landscaping, and maintenance) will also be expended for this project. This resource is seen as being readily available in the community; in fact, the present slow-down in the construction industry will be temporary and locally (County of Hawaii) alleviated by the construction of this project. This is felt to be beneficial.

A potential impact on historical resources may also occur should Alternative C be selected. Refer to Section IX following.

The proposed project will effect approximately 20,000 square feet of prime agricultural lands, see Exhibit 7, page EXH-10. This land is presently used for raising sugar cane and the removal of 20,000 square feet or less is not anticipated to significantly or adversely effect prime agricultural lands nor result in significant reductions in agricultural income for the sugar company.

IX. THE IMPACT ON PROPERTIES AND SITES OF HISTORIC AND CULTURAL SIGNIFICANCE

Upon consultation with the State Historic Preservation Office (SHPO), it was noted that the Pahoa Historic and Commercial District, Hawaii Island Site No. 7388, is located within the project area. The recommended alternative (A1) does not pass through nor affects the Pahoa Historic and Commercial District. This historical district lies adjacent to the present roadway (in Pahoa Town) and may be eligible for inclusion into the National Register of Historic Places pending a thorough historical and archaeological study. A letter from the State Historic Preservation Officer and additional information on the historical district and the individual description for various buildings are provided in Appendix F.

As discussed on pages 65 and 66, Alternative C has been eliminated from consideration, however, Alternative C (improvement of the existing roadway) would have a significant adverse impact on the Pahoa Historic and Commercial District. Alternative C would have resulted in the modification and/or removal of approximately 18 business structures within the village, many of which are included in the historic complex. Additionally, the selection of Alternative C would have required the preparation of a 4(f) Statement (relating to historic involvement).

The October 12, 1976 letter (see page F-1) from the SHPO indicated that there is a potential for historical/archaeological sites in certain areas around Pahoa.<sup>1</sup> Based on a review of this map and in comparison to the recommended alternative A1, it was found that portions (approximately 30 percent) of the proposed alignment is within the area in which an archaeological walk through (initial field visit to determine the possible existence of historical/archaeological sites) was recommended by SHPO. For these areas an archaeological walk through was conducted by Archaeological Research Center Hawaii, Inc. (ARCH) in January,

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<sup>1</sup> A map was included with the letter and has been reduced and redrafted as Exhibit 8, page EXH-11 in the Final EIS.

1979. The results of this archaeological reconnaissance (walk through) showed that there were no historical sites found within the Alternate A1 corridor. The two sites which were found in Area III, an old slaughter house and a modified lava tube were not within the proposed alignment; nor will they be affected by the construction and use of the proposed roadway. Exhibit 8, page EXH-11 shows the location of the areas of potential archaeological sites, as well as the location of the old slaughter house and modified lava tube.

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

It is felt that the by-pass alternatives would be generally complementary with the County's goals and policies to improve and move goods efficiently, safely, comfortably, and economically.<sup>1</sup> Additionally, the planning consultant for the Puna Community Development Plan has indicated (see Appendix G) that Alternative A route would be consistent with the preliminary recommendations which will be forthcoming in the draft of the Puna Community Development Plan.<sup>2</sup> Alternative A route would be consistent with this anticipated urban growth of Pahoā. The selection of this alternative would then provide access for this long-term urban development.

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<sup>1</sup> The General Plan, County of Hawaii, January, 1971. Page 70.

<sup>2</sup> The Puna Community Development Plan is still a draft, thus has not been officially accepted by the County.

## XI. COMMENTS AND COORDINATION

### A. Agencies Represented at the Informational Meetings

Two informational meetings for the proposed project were held at Pahoa Neighborhood Community on April 27, 1977 (7:30 p.m.) and on October 27, 1977 (7:30 p.m.). Various governmental agencies and private organizations sent representatives to these informational meetings.

Summaries of these Informational Meetings are provided in Appendix G.

### B. Agencies and Persons Consulted in the Preparation of the EIS

The governmental and private agencies identified on Table 16 were contacted and were requested to review and provide comments on the EIS Preparation Notice for this proposed project.

A total of 30 agencies were contacted. Nineteen (19) agencies responded to the EIS Preparation Notice. Of the 19 responses, 5 were of a "no comment" nature.

Appendix A provides copies of the comments received and the responses to those agencies having comments.

A list of the retained engineering and environmental consultants is provided in Appendix H.

Table 16. Agencies and Persons Consulted in the Preparation of the EIS

<u>Agency/Organization</u>	<u>Copy of EIS Determination Notice</u>	<u>Date Comment Received</u>	<u>Response From DOT</u>
<u>County Agencies</u>			
Department of Public Works	X	5/6/77	6/30/77
Department of Water Supply	X	5/10/77	7/7/77
Fire Department	X	5/12/77	--
Planning Department	X	5/25/77	7/5/77
Department of Research and Development	X	--	--
Police Department	X	--	--
<u>State</u>			
Department of Agriculture	X	5/11/77	6/30/77
Department of Accounting and General Services	X	5/12/77	6/30/77
Department of Planning and Economic Development	X	5/16/77	--
Office of Environmental Quality Control	X	5/20/77	7/5/77
Department of Health	X	5/24/77	6/30/77
Department of Land and Natural Resources	X	5/26/77	6/28/77
Department of Education	X	5/27/77	6/28/77
Department of Social Services and Housing	X	--	--

Table 16 (Con't.)

<u>Agency/Organization</u>	<u>Copy of EIS Determination Notice</u>	<u>Date Comment Received</u>	<u>Response From DOT</u>
<u>Federal Agencies</u>			
U.S. Department of the Interior Water Resources Division	X	5/3/77	7/7/77
Department of the Army, Corps of Engineers	X	5/9/77	--
U.S. Department of Agriculture, Soil Conservation Service	X	5/27/77	7/7/77
Department of Housing and Urban Development	X	--	--
Environmental Protection Agency	X	--	--
Hawaii Volcanoes National Park	X	--	--
Federal Highways Administration	X	--	--
<u>University of Hawaii</u>			
Water Resources Research Center	X	5/9/77	--
College of Tropical Agriculture	X	5/18/77	--
Environmental Center	X	5/26/77	--
<u>Public Utilities</u>			
Hawaii Electric Light Company, Inc.	X	5/5/77	6/28/77
Hawaiian Telephone Company	X	5/20/77	6/28/77
Hilo Gas Company	X	--	--

Table 16 (Con't.)

<u>Agency/Organization</u>	<u>Copy of EIS Determination Notice</u>	<u>Date Comment Received</u>	<u>Response From DOT</u>
<u>Other</u>			
Puna Sugar Company	X	--	--
Puna Community Council	X	--	--
LMLI Architects/Planners (Consultants for Puna Community Development Plan)	X	--	--

11-11-11 11:11:11

XII. DRAFT ENVIRONMENTAL IMPACT STATEMENT -  
COMMENTS AND DISPOSITIONS

The governmental and private agencies identified on Table 17 were contacted and were requested to review and provide comments on the Draft Environmental Impact Statement for this proposed project. A total of 47 agencies were contacted. Twenty seven (27) agencies responded to the Draft EIS. Of the 27 responses, 12 were of a "no comment" nature. The responses having substantive comments were reviewed and where appropriate corrections and/or clarifications were incorporated into the Final EIS. To indicate the correction/clarification, copies of the responses are provided in Appendix J; alongside the specific comment, the page number or section in the Final EIS which includes the correction/clarification is indicated.

Table 17. Agencies and Persons on the Draft EIS Mailing List\*

<u>Agency/Organization</u>	<u>Date of Correspondence</u>	<u>Date Received by DOT</u>
U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service		
U.S. Department of Agriculture, Soil Conservation Service	2/21/78	2/23/78
U.S. Department of Agriculture, Forest Service		
U.S. Department of Agriculture, Office of the Secretary		
U.S. Department of the Interior, Office of Environmental Project Review	3/13/78	3/15/78
U.S. Department of Housing and Urban Development	3/13/78	3/15/78
U.S. Department of Health, Education, and Welfare		
National Park Service, Hawaii Group Office		
U.S. Army, Corps of Engineers	2/13/78	2/14/78
Advisory Council on Historic Preservation		
U.S. Department of Commerce, Secretary for Environmental Affairs		
Federal Energy Administration, Office of Environmental Programs, Environmental Impact Division		
U.S. Environmental Protection Agency, Region IX	4/25/78	
U.S. Environmental Protection Agency, Region IX Library		

\* Request for the review and comment on the Draft EIS sent out on January 27, 1978.

(continue)

Table 17. Agencies and Persons on the Draft EIS Mailing List\*

<u>Agency/Organization</u>	<u>Date of Correspondence</u>	<u>Date Received by DOT</u>
County of Hawaii, Department of Public Works	2/9/78	2/13/78
County of Hawaii, Planning Department	3/8/78	3/10/78
County of Hawaii, Department of Water Supply	2/3/78	2/6/78
County of Hawaii, Department of Parks and Recreation	3/29/78	--
County of Hawaii, Department of Economic Research and Development	2/15/78	2/21/78
County of Hawaii, County Council	2/2/78	2/6/78
Hawaiian Telephone Company	2/21/78	2/22/78
Hawaii Electric Light Co., Inc.	2/21/78	2/23/78
Gasco, Inc., Hawaii Division	3/21/78	3/22/78
State of Hawaii, Department of Agriculture	3/7/78	3/8/78
State of Hawaii, Department of Accounting and General Services	2/7/78	2/9/78
State of Hawaii, Department of Defense	2/15/78	2/24/78
State of Hawaii, Department of Education	2/21/78	2/28/78
State of Hawaii, Department of Health	2/17/78	2/23/78
State of Hawaii, Department of Land and Natural Resources	2/17/78	2/24/78
State of Hawaii, State Historic Preservation Officer	2/17/78	2/24/78

\* Request for the review and comment on the Draft EIS sent out on January 27, 1978.

(continue)

Table 17. Agencies and Persons on the Draft EIS Mailing List\*

<u>Agency/Organization</u>	<u>Date of Correspondence</u>	<u>Date Received by DOT</u>
State of Hawaii, Department of Planning and Economic Development	3/22/78	3/24/78
State of Hawaii, Legislative Reference Bureau		
Honolulu Star-Bulletin (Newspaper)		
Honolulu Advertiser (Newspaper)		
Hawaii Tribune Herald, Ltd. (Newspaper)		
Bishop Museum		
Life of the Land		
American Lung Association of Hawaii	2/17/78	2/20/78
Puna Sugar Company	2/2/78	2/3/78
Puna Community Council		
Conservation Council of Hawaii, Hawaii Island Chapter	3/17/78	3/21/78
State of Hawaii, Department of Social Services and Housing	2/23/78 2/7/78	2/27/78 2/13/78 <sup>1</sup>
State of Hawaii, Office of Environmental Quality Control	3/28/78	3/30/78
University of Hawaii, Environmental Center		
University of Hawaii, Water Resources Research Center	2/16/78	2/22/78

<sup>1</sup> Two responses were received; the earlier response from the Hawaii Housing Authority of the Department.

\* Request for the review and comment on the Draft EIS sent out on January 27, 1978.

(continue)

Table 17. Agencies and Persons on the Draft EIS Mailing List\*

<u>Agency/Organization</u>	<u>Date of Correspondence</u>	<u>Date Received by DOT</u>
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The following agencies were requested to place the Draft EIS in their library; making the document available to other interested groups/individuals:

State of Hawaii, Department of Planning and Economic Development Library

State of Hawaii, State Library Branch

University of Hawaii Libraries

State of Hawaii, Hawaii Public Library (Regional Library)

State of Hawaii, Hawaii Public Library (Pahoa Branch)

University of Hawaii at Hilo Library

00  
2

\* Request for the review and comment on the Draft EIS sent out on January 27, 1978.

XIII. LIST OF NECESSARY APPROVALS

The following approvals, permits, and/or clearances are necessary prior to the construction of the proposed project:

1. Amendment to the General Plan, County of Hawaii

As discussed earlier, an amendment to the General Plan may be required if it is determined by the County that the project is not consistent with the General Plan.

2. Subdivision Approval, Planning Department, County of Hawaii

A subdivision approval must be obtained from the Planning Department, County of Hawaii.

3. Coordination and Clearance with the State Department of Land and Natural Resources

This coordination and clearance is necessary in order to avoid any adverse impact on parks and other recreational resources.

4. Coordination and Clearance with the State Historic Preservation Office

This coordination and clearance is required in order to avoid adverse impact on historical and/or archaeological sites of importance.

5. A-95 Clearance with the State Clearinghouse (located with the Department of Land and Natural Resources) and the Metropolitan Clearinghouse (City Planning Department)

To determine the compatibility of the project with the interests of the reviewing agencies. The procedure is in accordance with the OMB (Federal Office of Management and Budget) Circular A-95 directive.

6. Building Permit from the Department of Public Works, County of Hawaii

This permit to approve the construction of the roadway and other improvements is required for all projects of this nature. It is normal to receive signature approvals from other agencies (e.g. Department of Water Supply, State Department of Health, Fire Department) on the submitted plans.

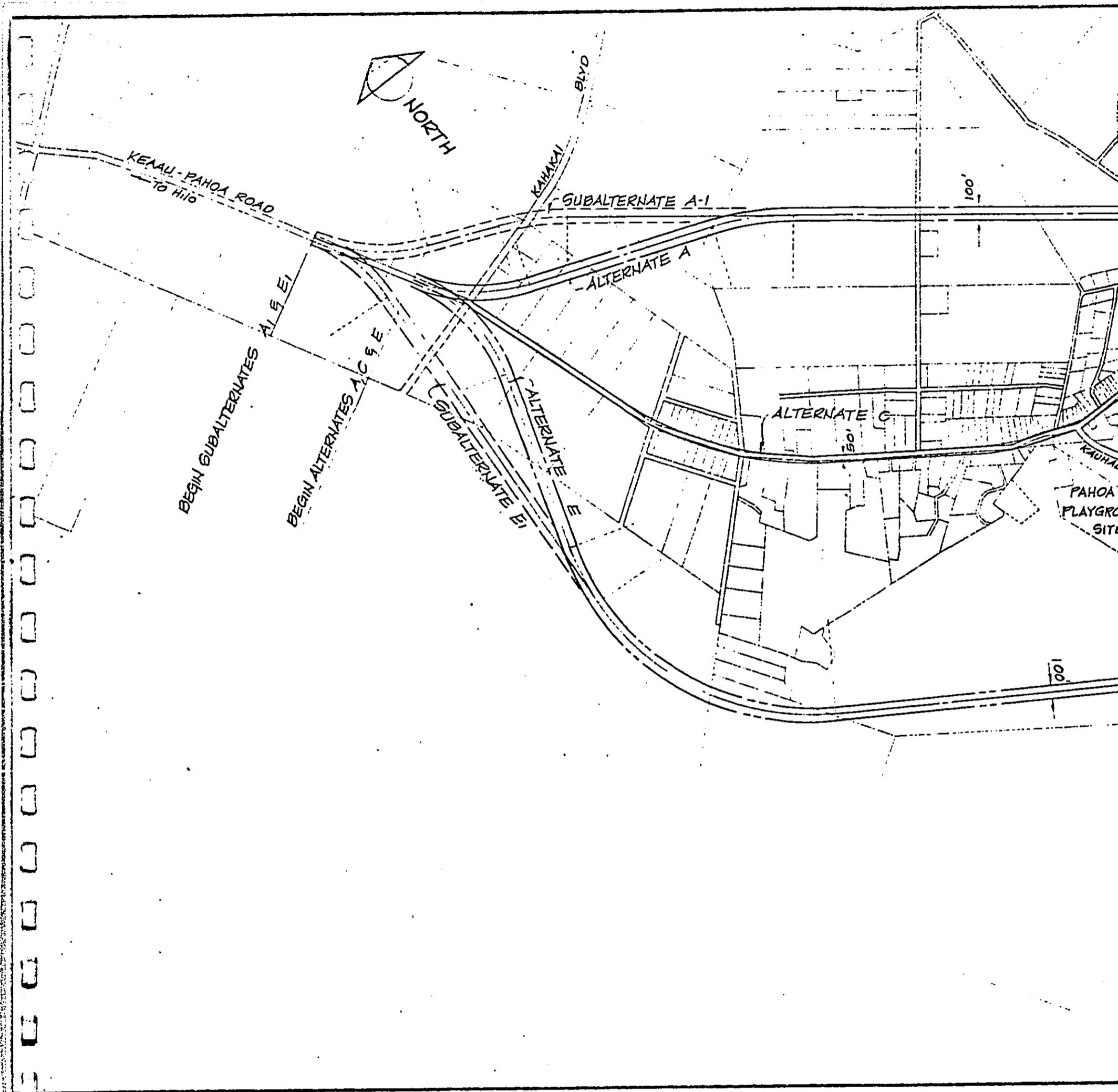
#### XIV. BIBLIOGRAPHY

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5. Lamoureux, Charles H., Trailside Plants of Hawaii's National Parks, 1976.
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11. \_\_\_\_\_, Economic and Social Effects of Highways, Federal Highway Administration, Washington, D.C., 1974.
12. Environmental Protection Agency, Guidelines for Review of Environmental Impact Statements, Volume 1: Highway Projects.
13. Environmental Protection Agency, Guidelines for Air Quality Maintenance Planning and Analysis Volume 9: Evaluating Indirect Sources.

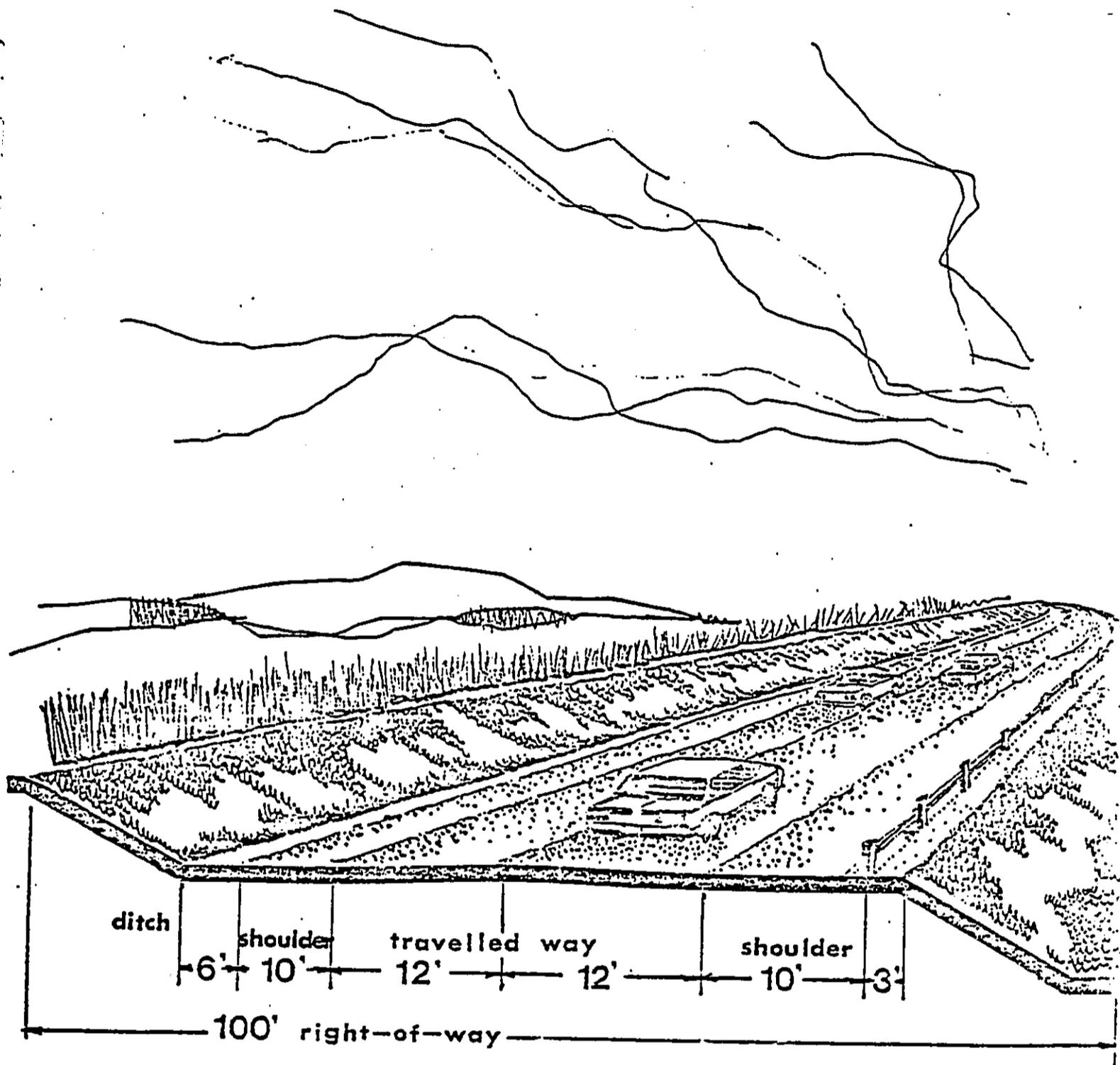
Additional references for specific technical studies are acknowledged in each of the respective reports in Appendices B, C, and D.

# Exhibits

- EXHIBIT 1. ALIGNMENT CORRIDOR STUDY, KEAAU-PAHOA ROAD,  
PAHOA BY-PASS
- EXHIBIT 2. TYPICAL SECTION
- EXHIBIT 3. TYPICAL SECTION THROUGH PAHOA TOWN
- EXHIBIT 4. PHOTOGRAPHS OF EXISTING PAHOA ROAD IN THE VICINTY  
OF PAHOA VILLAGE
- EXHIBIT 5. VOLCANIC HAZARD MAP
- EXHIBIT 6. PORTION OF LAND USE ALLOCATION MAP,  
COUNTY OF HAWAII, GENERAL PLAN
- EXHIBIT 7. AGRICULTURAL LANDS OF IMPORTANCE TO THE  
STATE OF HAWAII
- EXHIBIT 8. PORTION OF THE PROPOSED ALIGNMENT IN WHICH  
POTENTIAL HISTORICAL/ARCHAEOLOGICAL SITES  
MAY EXIST







TYPICAL SECTION

EXHIBIT 2



PHOTOGRAPHS OF EXISTING PAHOA ROAD IN THE VICINITY OF PAHOA VILLAGE

Taken: April, 1977

1. View of existing roadway (looking toward Kalapana direction) at Shell Service Station.
2. View of existing roadway (looking toward Kalapana direction) entering Pahoa Village. Note the proximity of the homes/driveways to the existing road.
3. View of the central portion of Pahoa Village, commercial area (looking in a Kalapana direction).
4. View of commercial area (right after photograph 5) looking in a Kalapana direction. Note the use of the roadway for parking and the sharp curve coming up in the background.
5. View of the existing road going through the Pahoa High and Elementary School area (looking in the Kalapana direction). The school is located in the right background area. Residences are on the left (makai) side.
6. View of the Pahoa-Kapoho Road and Pahoa-Kalapana Road Junction (taken from the Pahoa-Kalapana Road toward a makai (north) direction. Pahoa High and Elementary School, Community School and Library is located on the left side of the photograph.



1



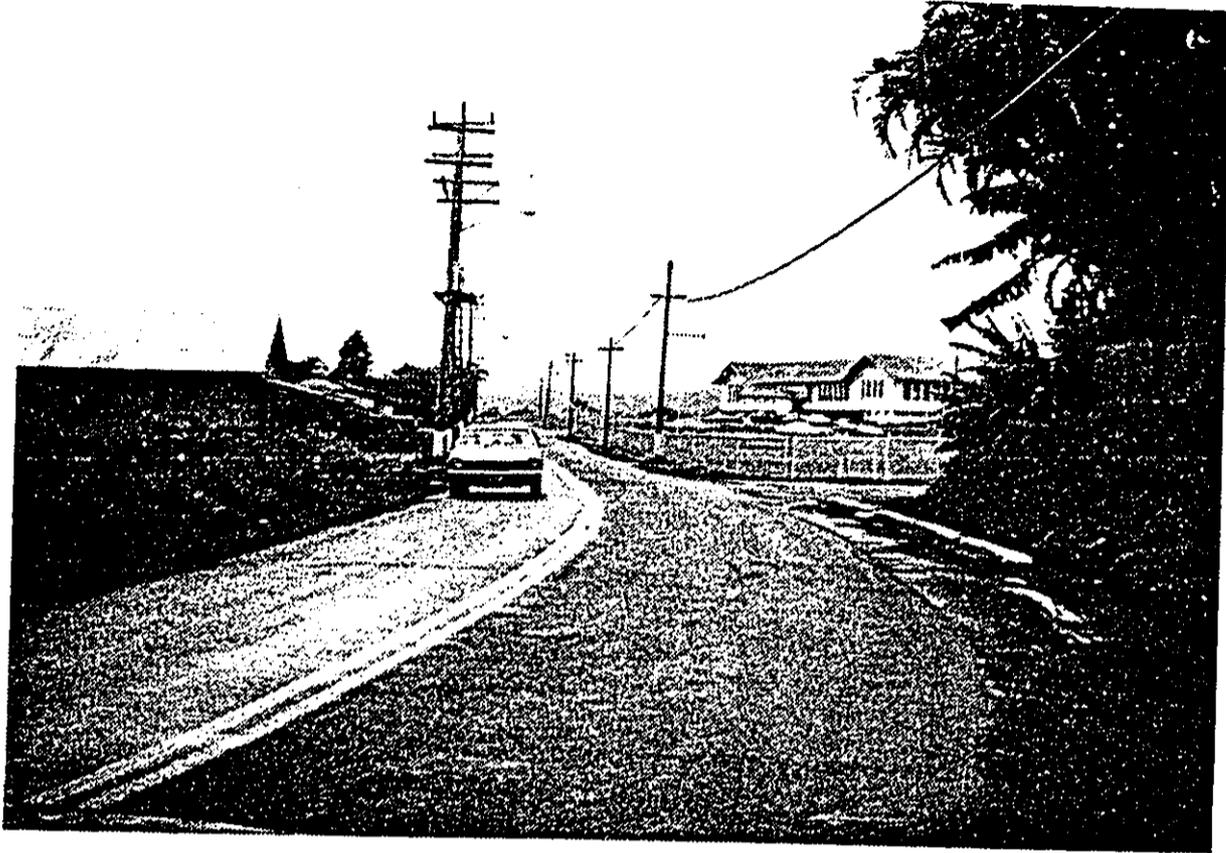
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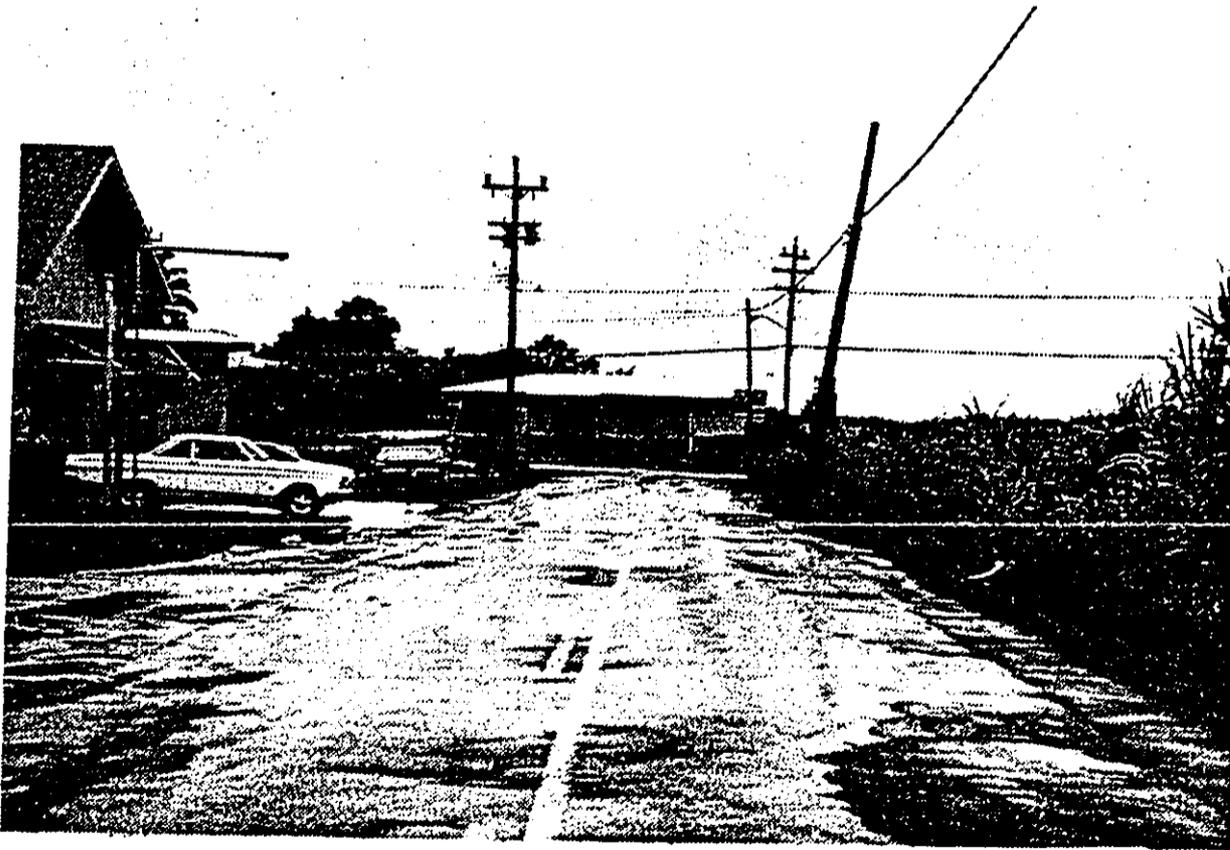
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4



5



6

EXH-7

## EXHIBIT 5

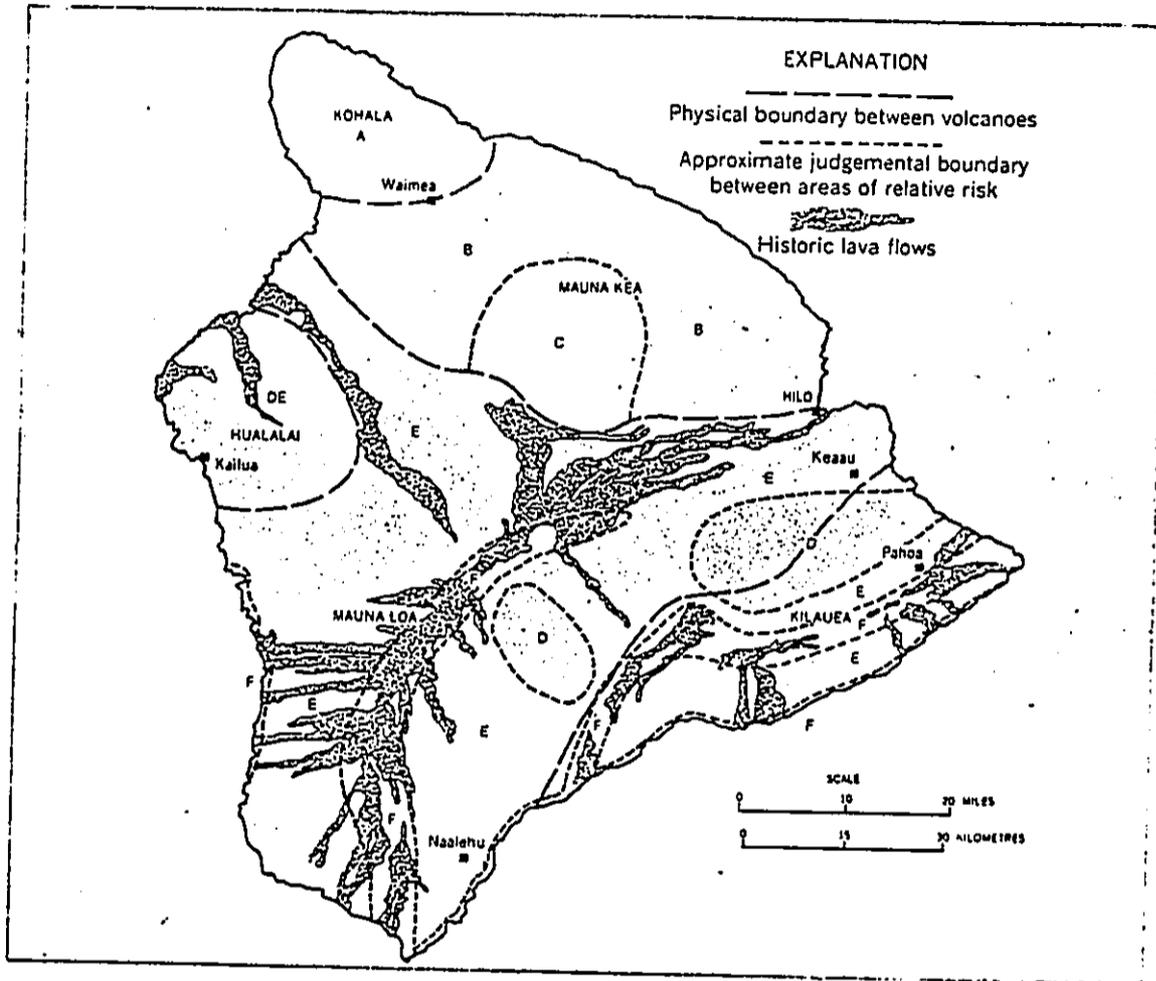


Figure 2.—Areas of relative risk from volcanic hazards. Risk increases from "A" through "F". Map shows lava flows erupted between the years 1800 and 1974.

Table 2.—Number of eruptions originating within hazard areas and number of times lava flows have covered land within hazard areas during historic and recent prehistoric time.

Area	Historic time (since approximately 1800)			Recent prehistoric time (5,000-year interval prior to 1800)	
	Number of times vents have erupted within area	Number of times lava flows have covered land within area	Percentage of land covered within area	Number of times vents have erupted within area (estimated)	Number of times lava flows have covered land within area (estimated)
A	0	0	0	0	0
B	0	0	0	0	0
C	0	0	0	Less than 5	Less than 5
D	0	0	0	0	More than 10*
DE	1	2	6	More than 10	More than 10
E	1	35*	15	About 10	More than 100*
F	80	More than 80	50	About 2,000	More than 2,000

\*Most lava flows that entered areas D and E erupted from vents in area F.

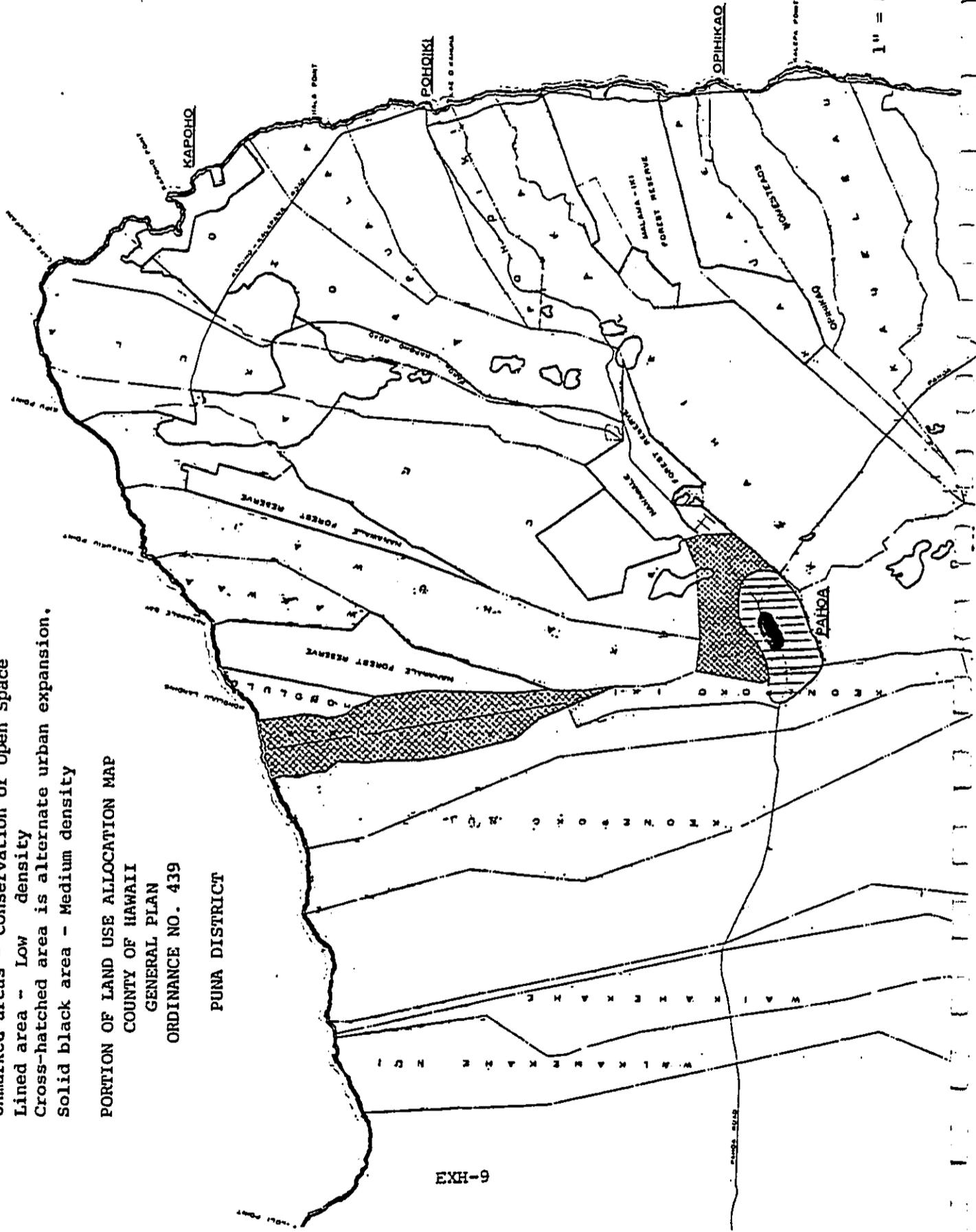
Source: Natural Hazards on the Island of Hawaii, United States Department of the Interior/Geological Survey, USGS: INF-75-18.

EXHIBIT 6

Unmarked areas - Conservation or Open Space  
Lined area - Low density  
Cross-hatched area is alternate urban expansion.  
Solid black area - Medium density

PORTION OF LAND USE ALLOCATION MAP  
COUNTY OF HAWAII  
GENERAL PLAN  
ORDINANCE NO. 439

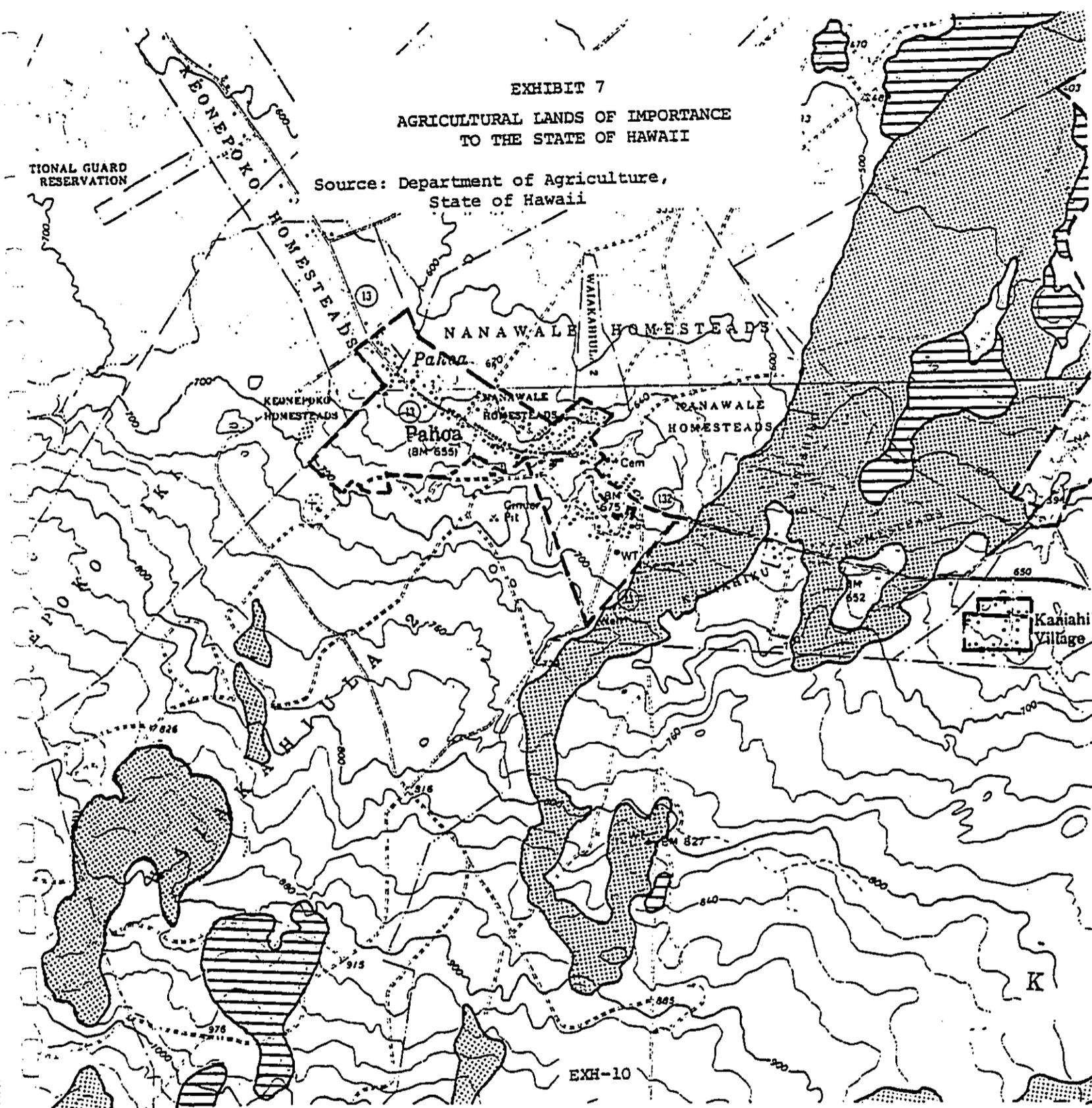
PUNA DISTRICT



EXH-9

EXHIBIT 7  
 AGRICULTURAL LANDS OF IMPORTANCE  
 TO THE STATE OF HAWAII

Source: Department of Agriculture,  
 State of Hawaii

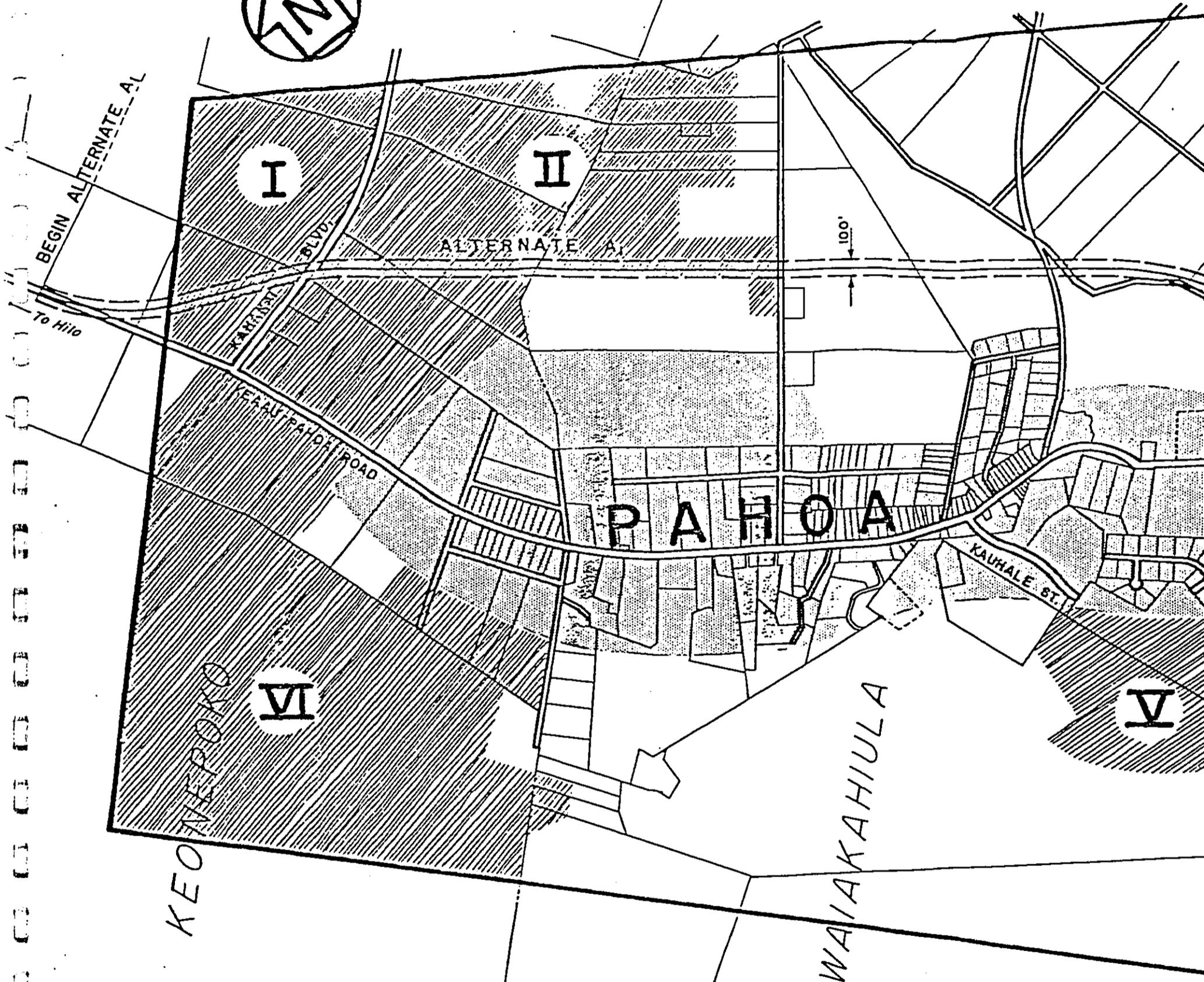


-  PRIME AGRICULTURAL LAND - Land which has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods.
-  UNIQUE AGRICULTURAL LAND - Land that has the special combination of soil quality, location, growing season, moisture supply, and is used to produce sustained high quality and or high yields of a specific crop when treated and managed according to modern farming methods.
-  OTHER IMPORTANT AGRICULTURAL LAND - Land other than Prime or Unique Agricultural Land that is also of state-wide or local importance for agricultural use.
-  EXISTING URBAN DEVELOPMENT - Land which has been developed for urban type use.
-  U.S. GOVERNMENT - Land which is currently under the jurisdiction of the U.S. Government.

Scale: 1" = 2000'

EXH-10

EXHIBIT 8.  
 PORTION OF THE RECOMMENDED ALIGNMENT A1 IN WHICH  
 ARCHAEOLOGICAL SITES MAY EXIST



Lined areas=Areas designated by  
 the staff of the State Historic  
 Preservation Office on a smaller  
 scale aerial map.

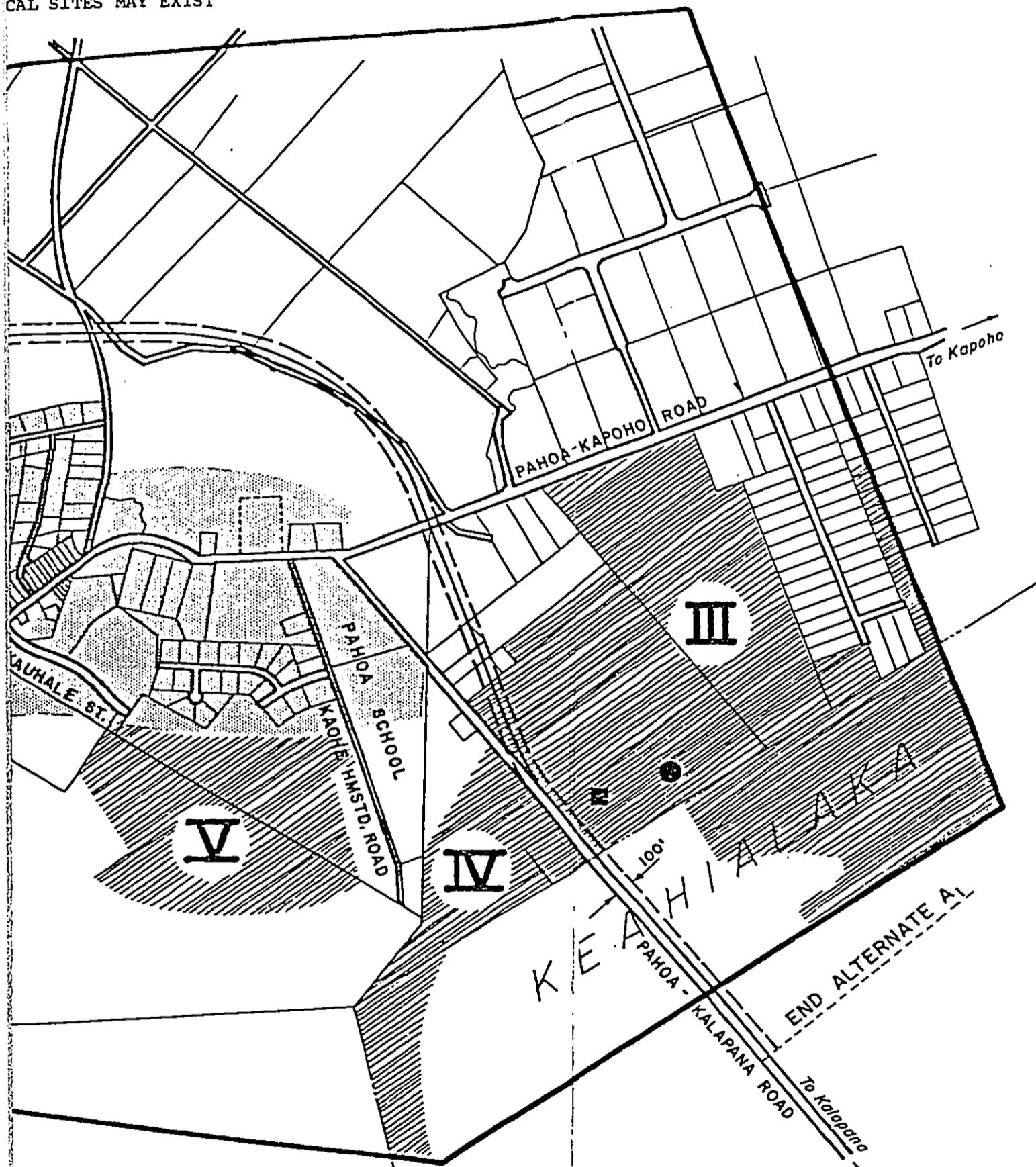
EXH-11

ARCHAEOLOGICAL RECONNAISSANCE  
 KEONEPOKO-WAIAKAHIULA-KEAHIALAKA, PUNA

Pahoa By-Pass RS 130 (17) Alternate A1  
 A.R.C.H. 14-140

Drawn By: cmh January 1979

EXHIBIT 8.  
ALIGNMENT A1 IN WHICH POTENTIAL HISTORICAL/  
CAL SITES MAY EXIST



RECONNAISSANCE  
KAHIALAKA, PUNA, HAWAII  
(17) Alternate A1  
-140  
January 1979



- - OLD SLAUGHTER HOUSE
- - MODIFIED LAVA TUBE AND ASSOCIATED ARCHAEOLOGICAL REMAINS

# Appendices

- APPENDIX A. REPRODUCTION OF COMMENTS RECEIVED ON THE EIS PREPARATION NOTICE
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APPENDIX A. REPRODUCTION OF COMMENTS RECEIVED ON  
THE EIS PREPARATION NOTICE

Pages A-3 to A-23 are copies of comments received and dispositions to these comments on the EIS Preparation Notice.

The order of comments and the State Department of Transportation's (DOT) response is as follows:

<u>County Agencies</u>	<u>Date of Letter</u>	<u>Page</u>
1. Department of Public Works	May 4, 1977	A-3
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3. Department of Water Supply	May 6, 1977	A-4
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5. Fire Department (No comment - no response required)	May 10, 1977	A-5
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<u>State Agencies</u>		
8. Department of Agriculture	May 9, 1977	A-7
9. DOT Response	June 30, 1977	A-7
10. Department of Accounting and General Services	May 11, 1977	A-8
11. DOT Response	June 30, 1977	A-8
12. Department of Planning and Economic Development (No comment - no response required)	May 12, 1977	A-9
13. Office of Environmental Quality Control	May 18, 1977	A-10
14. DOT Response	July 5, 1977	A-11
15. Department of Health	May 18, 1977	A-12
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<u>State Agencies (continued)</u>	<u>Date of Letter</u>	<u>Page</u>
17. Department of Land and Natural Resources	May 25, 1977	A-13
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19. Department of Education	May 23, 1977	A-14
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<u>Federal Agencies</u>		
21. U.S. Department of the Interior, Geological Survey, Water Resources Division	May 2, 1977	A-16
22. DOT Response	July 7, 1977	A-16
23. Department of the Army, Corps of Engineers (No comment - no response required)	May 5, 1977	A-17
24. U.S. Department of Agriculture Soil Conservation Service	May 26, 1977	A-18
25. DOT Response	July 7, 1977	A-18
<u>University of Hawaii</u>		
26. Water Resources Research Center (No comment - no response required)	May 3, 1977	A-19
27. College of Tropical Agriculture	May 13, 1977	A-20
28. DOT Response	June 29, 1977	A-20
29. Environmental Center (No comment - no response required)	May 23, 1977	A-21
<u>Public Utilities</u>		
30. Hawaii Electric Light Company, Inc.	May 3, 1977	A-22
31. DOT Response	June 28, 1977	A-22
32. Hawaiian Telephone Company	May 18, 1977	A-23
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E. ALVY WRIGHT  
Director  
Public Works  
Department of Transportation  
505 Punchbowl Street  
Honolulu, Hawaii 96813

BY MAIL TO  
E. ALVY WRIGHT  
2.38275



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

June 30, 1977

GEORGE B. ANTONIO  
Assistant Director

SUBURBAN AND DIVISIONS  
AUTOMATIC EQUIPMENT & MAINTENANCE  
ROADWAY CONSTRUCTION & MAINTENANCE  
TRUCK & TRAILER REGISTRATION  
PUBLIC SAFETY & MAINTENANCE  
TRAFFIC OPERATIONS

MAY 6 12 36 PM '77



RECEIVED

MAY 9 4 01 PM '77  
DEPT. OF TRANSPORTATION  
LAND TRANSPORTATION FACILITIES DIVISION  
DEPT. OF PUBLIC WORKS TRANSPORTATION  
505 PUNCHBOWL ST.  
HONOLULU, HAWAII 96813

May 4, 1977

HILSHIEH T. MASAYUCHI  
MAYOR  
EDWARD K. HARADA  
CHIEF ENGINEER

Adm. E. Alvy Wright, Director  
Department of Transportation  
505 Punchbowl Street  
Honolulu, HI 96813

SUBJECT: KEAAU-PAHOA ROAD, PAHOA BYPASS  
EIS Preparation Notice

We have reviewed the subject document and we are in favor of the bypass project. We will have specific comments when we review the drawings of the various alignments. We feel, though, that the alignment should not be along the present alignment through Pahoa town.

*E. Alvy Wright*  
EDWARD HARADA  
Chief Engineer

Mr. Edward Harada  
Chief Engineer  
Department of Public Works  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Harada:

Subject: Keaaupahoa Road, Pahoa Bypass  
Project No. 130AB-01-76

Thank you for your comments on the proposed Keaaupahoa Road and the EIS Preparation Notice. As you may be aware of, our recent information meeting and correspondence from various agencies have indicated to us that a large majority of the governmental agencies contacted and community leaders feel that the present alignment through Pahoa town should not be selected. We will, in our evaluation of the three alternatives, give serious consideration to these opinions.

Your comments will be incorporated into the EIS which is in the process of being prepared. A copy of this EIS will be sent to your department for further review and comments. If we can provide further information, please do not hesitate to contact us.

Sincerely,

*E. Alvy Wright*  
for E. ALVY WRIGHT  
Director



DEPARTMENT OF WATER SUPPLY  
P. O. BOX 1820

RECEIVED  
MAY 12 10 19 AM '77  
MAY 10 1 02 PM '77  
DEPT. OF TRANSPORTATION  
FACILITIES DIVISION

May 6, 1977

Mr. E. Alvey Wright  
Director  
Department of Transportation  
869 Punahoa Street  
Honolulu, HI 96813

Re: Keolu-Pahoia Road, Pahoia Bypass  
Environmental Impact Statement  
Preparation Notice

Our Department currently utilizes two groundwater sources (Pahoia Deep Wells) which are located off the Pahoia-Kalapana Road and which are situated at an approximate elevation of 700 feet.

Recent local legislation has placed stringent controls and requirements on the protection of underground water sources, both existing and future. Conceivably, rerouting of the existing roadway toward the mauka or westerly side could lead to new developments and urbanization that may be situated upstream or in close proximity to our groundwater sources. The subsequent activities associated with urbanization may endanger the water sources.

In your environmental impact statement, we would appreciate your addressing this concern.

Thank you for allowing us the opportunity to offer comments on this environmental impact statement preparation notice.

*E. A. Fujimoto*  
Akira Fujimoto  
Manager

STATE RECEIVED  
MAY 13 3 49 PM '77  
LAND TRANSPORTATION  
FACILITIES DIVISION  
PLANNING BRANCH

... Water brings progress...

GEORGE R. AUTOSH



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
440 PUNAHOA STREET  
HONOLULU, HAWAII 96813

July 7, 1977

LT-PA  
2,38279

Mr. Akira Fujimoto, Manager  
Department of Water Supply  
P.O. Box 1820  
Honolulu, Hawaii 96820

Dear Mr. Fujimoto:

Subject: Keolu-Pahoia Road, Pahoia Bypass

We have received your letter of May 6, 1977 regarding the Keolu-Pahoia Road EIS Preparation Notice. Thank you for your comments relating to the present groundwater sources (Pahoia Deep Wells) which are located mauka of the existing Pahoia-Kalapana Road at an elevation of approximately 700 feet. At this time we do not anticipate that this proposed roadway project will be affecting your present groundwater sources. Although the roadway will be improved adjacent to the water tank along Pahoia-Kalapana Road, this should not result in any displacement or modification of this water tank.

Your comment that rerouting the roadway mauka or westerly side of Pahoia Town may lead to new developments and urbanization that may endanger the existing water resources will be incorporated in the EIS.

A copy of the EIS will be provided to your department for your review and comments.

Sincerely,  
*E. Alvey Wright*  
for E. ALVEY WRIGHT  
Director





COUNTY OF HAWAII

**PLANNING DEPARTMENT**

25 ANPUNI STREET - HILO, HAWAII  
DEPT. OF TRANSPORTATION  
FACILITIES DIVISION

DIRECTOR'S OFFICE  
MAY 25 1 07 PM '77  
DEPT. OF TRANSPORTATION  
FACILITIES DIVISION

GEORGE B. ANDERSON  
Secretary



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
440 FURNACE STREET  
HONOLULU, HAWAII 96813

E. ALVEY WRIGHT  
Director  
1101 KALANANAKUI  
HALLWAY ROOM  
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
FACILITIES DIVISION  
CHARLES G. BISHOP

IN REPLY REFER TO  
LT-PA  
2.38269

July 5, 1977

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

Dear Sir:

Keanu-Pahoia Road, Pahoia Bypass  
Environmental Impact Statement Preparation Notice

Thank you for the opportunity to review the above-described Environmental Impact Statement.

Since the project is still in its preliminary stages, we have no specific comments to offer at this time. We do suggest, however, that your Department investigate the possibility of starting the by-pass road further towards the Keanu side of Pahoia, rather than at the Kalakai Boulevard intersection. The primary reason is that Kalakai Boulevard is a heavily traveled roadway. The Hawaiian Beaches and Parks and the Hawaiian Shores Subdivisions, which use Kalakai Boulevard as their principal access, have a combined total of over 600 homes.

We will provide you with our comments as the plans become more finalized. Should you need any assistance in the meantime, please feel free to contact us.

Sincerely,  
*(Signature)*  
SIDNEY FUKU  
Director

NI:rfd  
cc: Chief Engineer

Mr. Sidney Fuku, Director  
Planning Department  
County of Hawaii  
25 Anpunl Street  
Hilo, Hawaii 96720

Dear Mr. Fuku:

Subject: Keanu-Pahoia Road, Pahoia By-pass  
Project No. 130AB-01-76

Thank you for your letter of May 24, 1977 regarding the Keanu-Pahoia Road EIS Preparation Notice. We have reviewed your comments and are evaluating the possibility of beginning the by-pass road before Kalakai Boulevard. Should we select a corridor alignment which intersects Kalakai Boulevard, the intersection will be designed to accommodate safe movement of vehicles utilizing the boulevard.

We are in the process of preparing the EIS as well as evaluating the three alternative corridors. We will submit to your department a copy of the EIS for your further review and comments.

Sincerely,  
*(Signature)*  
for E. ALVEY WRIGHT  
Director



E. ALVEY WRIGHT  
Director



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
405 FORTAQUON STREET  
HONOLULU, HAWAII 96813

13-PA  
2.38276

June 30, 1977

EDWARD R. ARIYASU  
Chairman

EDWARD R. ARIYASU, JR.  
Chairman  
BOARD OF AGRICULTURE  
1428 SOUTH KING STREET  
HONOLULU, HAWAII 96814



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
405 FORTAQUON STREET  
HONOLULU, HAWAII 96813

May 9, 1977

MEMORANDUM

To: Mr. E. Alvey Wright, Director  
Department of Transportation

Subject: Kona-Pahoa Road, Pahoa Bypass  
Environmental Impact Statement Preparation Notice

The Department of Agriculture has reviewed the subject notice. Our major concern would be the potential adverse impact of the project upon agricultural activities in the area. We note that this concern will be addressed in the environmental impact statement.

If our agency can be of any assistance during the E.I.S. preparation, please contact me.

*John Farinas, Jr.*

JOHN FARIAS, JR.  
Chairman, Board of Agriculture

Subject: Kona-Pahoa Road, Pahoa Bypass  
Project No. 130AB-01-76

Dear Mr. Farinas:

Thank you for your comments of May 9, 1977 regarding the Kona-Pahoa Road EIS Preparation Notice. At this time we are aware of the potential impact a waikei or mauka by-pass route would have on sugarcane production. Based on our information, the waikei route east of Pahoa Town will displace a greater amount of sugarcane lands than the mauka route west of Pahoa Town. However, we are also in the process of preparing a socioeconomic study which will specifically show the displacement of agriculture, both sugarcane and diversified.

We will contact your staff during the preparation of the EIS so that any agricultural concerns will be disclosed in the EIS.

Sincerely,  
*R. H. Wright*  
for E. ALVEY WRIGHT  
Director

RECEIVED  
MAY 12 2 31 PM '77  
DEPT. OF TRANSPORTATION  
LAND TRANSPORTATION  
FACILITIES DIVISION

MAY 13 9 46 AM '77  
PLANNING DIVISION  
LAND TRANSPORTATION  
FACILITIES DIVISION

ORIGINAL IS AVAILABLE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
115 FURNACEWAY STREET  
HONOLULU, HAWAII 96810



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
115 FURNACEWAY STREET  
HONOLULU, HAWAII 96810

IN REPLY REFER TO:  
IT-PA  
2.38277

June 30, 1977

DIRECTOR'S OFFICE  
MAY 12 1 35 PM '77  
DEPT. OF TRANSPORTATION  
FACILITIES DIVISION



RECEIVED  
MAY 16 1 45 PM '77  
DEPT. OF TRANSPORTATION  
FACILITIES DIVISION

GEORGE R. ANTUSIS  
COMPTROLLER

INFO: MURAKAMI  
COMPTROLLER  
JANE K. TOMUNAOA  
SECURITY COMPTROLLER

LETTER NO. (P) 1467.7

MAY 11 1977

Honorable E. Alvey Wright  
Director  
Department of Transportation  
State of Hawaii  
Honolulu, Hawaii

Dear Admiral Wright:

Subject: Keaau-Paho Road, Paho Bypass  
Environmental Impact Statement  
Preparation Notice

A master plan was recently prepared for the reconstruction and expansion of the existing Paho High and Elementary School. Since the school is located at the Paho-Kapoho-Kalapana Junction, it is anticipated that any improvements to the existing Paho-Kalapana Road, PAS 130 will affect the school plant. We therefore support the selection of bypass corridors which will minimize impact on the school.

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

Very truly yours,

*Hideo Murakami*  
HIDEO MURAKAMI  
State Comptroller

The Honorable Hideo Murakami  
Director  
Department of Accounting and  
General Services  
P.O. Box 119  
Honolulu, Hawaii 96810

Dear Mr. Murakami:

Subject: Keaau-Paho Road, Paho Bypass  
Project No. 130AD-01-76

Thank you for your comments of May 11, 1977 regarding the Keaau-Paho Road EIS Preparation Notice. Your comments will be incorporated into the EIS. Additionally, we will also be contacting your department to review the Master Plan for the Paho High and Elementary School. This review will assist us in determining the impact of the alternative corridors on this school.

Your comments will be incorporated into the EIS we are presently in the process of preparing. A copy of this EIS will be submitted to your department for review and further comments.

Sincerely,  
*R. Nigashikawa*  
for E. ALVEY WRIGHT  
Director

RECEIVED  
STATE DEPARTMENT  
OF TRANSPORTATION  
MAY 18 12 58 PM '77  
LAND TRANSPORTATION  
FACILITIES DIVISION  
PLANNING BRANCH



DEPARTMENT OF PLANNING  
AND ENVIRONMENTAL DEVELOPMENT  
STATE OF HAWAII  
1505 KALANOAULANI DRIVE, SUITE 200  
HONOLULU, HAWAII 96813  
TELEPHONE: 521-2100  
FACSIMILE: 521-2101

DIRECTOR'S OFFICE  
MARK TOBINO  
Project Director

CELESTE B. ARYDOM  
Assistant Director  
MARK TOBINO  
Project Director  
LESLIE SAKAYAMA  
Project Director

TRANSPORTATION

Ref. No. 3557

May 12, 1977

The Honorable E. Alvey Wright  
Director  
Department of Transportation  
State of Hawaii  
Honolulu, Hawaii

Dear Mr. Wright:

Subject: Environmental Impact Statement Preparation Notice  
for the Pahoa Bypass Road, Puna District, Island  
of Hawaii

We have reviewed the subject E.I.S. Preparation Notice and find that, in general, it has adequately identified the major environmental impacts which can be anticipated from the implementation of this project.

We have no other comments to offer at this time but would appreciate the opportunity for further comment when the environmental impact statement is available for review.

Thank you for the opportunity to review this preparation notice.

Sincerely,  
*Luana*  
LUANA KIRIO

CELESTE R. AMYDUSH  
SECRETARY



RECEIVED  
MAY 23 9 17 AM '77  
DEPARTMENT OF TRANSPORTATION  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
STATE OF HAWAII  
DEPT. OF TRANSPORTATION  
MAY 20 3 28 PM '77  
DIRECTOR'S OFFICE  
RICHARD E. HARLAND, DIRECTOR  
TELEPHONE NO. 548-6888  
FACSIMILE NO. 548-6888

OFFICE OF THE GOVERNOR  
STATE OF HAWAII  
ROOM 304  
1600 KALIHI DRIVE  
HONOLULU, HAWAII 96813  
MAY 18, 1977

MEMORANDUM

TO: E. Alvey Wright, Director  
Department of Transportation

FROM: Richard E. Harland, Director  
Office of Environmental Quality Control

SUBJECT: Environmental Impact Statement Preparation Notice  
for the Proposed Keolu-Pahoia Road, Pahoia Bypass,  
Hawaii

This Office has reviewed the subject EIS Preparation Notice. We offer the following comments for your consideration: We wish to point out that the geothermal projects in Puna would also be served by this highway.

The soil types in the project area should be described in relation to the various proposed alignments. The type of agricultural activity that would be affected by the highway is directly associated with the soil types in the Pahoia area. The alignments should seek to minimize the removal of productive agricultural lands.

The statement on p. 10 of the EIS Preparation Notice is misleading. It implies that "air emissions and noise from vehicles will be removed from the commercial/residential area of Pahoia Village." This is, of course, only partially correct. The present road would still service the business area although with perhaps, less traffic.

Natural hazards which affect the Pahoia community and therefore the proposed project should receive greater attention. Hazard are "E" as designated by the USGS, should be fully described. The potential impact of encouraging persons to reside in geologically hazardous areas by improving the access should be assessed.

The potential future growth areas of Pahoia should be shown in the EIS, along with a discussion of population growth potential that might occur due to the implementation of this project.

Thank you for allowing us to provide comments on this EIS Preparation Notice.



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
800 PUNAHOU STREET  
HONOLULU, HAWAII 96813

July 5, 1977

6. ALWAYS WILLING  
TO HELP  
HONOLULU, HAWAII 96813  
DEPARTMENT OF TRANSPORTATION  
800 PUNAHOU STREET  
HONOLULU, HAWAII 96813

DEPT. OF TRANSPORTATION  
117-PA  
2.38266

Dr. Richard E. Marland  
Page 2

LT-PA 2.38266

Dr. Richard E. Marland  
Director  
Office of Environmental Quality  
Control  
550 Halekuanila Street, Room 301  
Honolulu, Hawaii 96813

Dear Dr. Marland:

Subject: Keanu-Pahoia Road, Pahoia By-pass  
Project No. 130AD-01-76

Thank you for your comments of May 18, 1977. Our response to each of your comments follow:

1. We will be including in the EIS, the geothermal projects that may be served by this roadway improvement. Additionally, we will indicate the location on the project in a map.
2. Presently a socioeconomic impact report is being prepared. The report will include impacts on different types of agricultural lands. Additionally, we will review the general soil types of the three alternative alignments as provided by the U. S. Soil Conservation Service.
3. In general, we find that with the by-pass alternatives air emissions and noise levels will be reduced from the commercial residential areas of Pahoia Village, to the extent of the amount of traffic removed from Pahoia Village. Presently,

an air quality impact analysis and noise study are being prepared so that we will provide evaluation of these aspects for each alternative within the EIS.

4. The natural hazards which were described in the EIS Preparation Notice will be more fully referenced and elaborated upon. On the Island of Hawaii approximately 60% of the land area is designated E and F which are considered the two areas of highest risk (in terms of relative degree of hazards within these areas). Most notably, the city of Hilo and virtually the entire districts of Puna, Kaa, Kona and South Hilo are within the areas E and F. Therefore, we note that it is difficult, if not impossible, to assess how people could be encouraged or discouraged in living in these areas.

5. We are presently in contact with the consultant for the Puna Community Development Plan (CDP). Based upon our evaluation of this CDP and the proposed project, we will provide discussion on the impact of the project on population growth and the direction of future urban growth in the Pahoia area.

We hope that we have adequately responded to your comments. If we can provide more information or elaborate on our responses, please do not hesitate to contact us. We will also be providing you with a copy of the EIS for your further review and comments.

Sincerely,

*R. Nigashikawa*  
for R. ALVIN WRIGHT  
Director

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
CHARLES S. ANTONSON  
DIRECTOR

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
140 PUNAHOU, STREET  
HONOLULU, HAWAII 96813

STATE OF HAWAII  
147-PA  
2,38278

GEORGE N. ANTONSON  
DIRECTOR

DIRECTOR'S OFFICE

RECEIVED  
MAY 24 1 00 PM '77  
STATE OF HAWAII  
DEPARTMENT OF HEALTH  
140 PUNAHOU, STREET  
HONOLULU, HAWAII 96813  
MAY 18, 1977

RECEIVED  
MAY 22 11 11 AM '77  
OFFICE OF THE DIRECTOR  
DEPARTMENT OF HEALTH

RECEIVED  
STATE DEPARTMENT  
OF TRANSPORTATION  
MAY 31 1 12 PM '77  
LANG TRANSPORTATION  
FACILITIES DIVISION  
PLANNING BRANCH

**MEMORANDUM**

To: Mr. E. Alvey Wright, Director  
Department of Transportation

From: Deputy Director for Environmental Health

Subject: Keaau-Paho Road, Paho Bypass, Environmental Impact  
Statement Preparation Notice

Thank you for allowing us to review and comment on this  
EIS. Your coordination with this office is appreciated.

The direction of the trade winds should be a consideration  
in selecting route locations. The selected route should be downwind  
from the town.

*James S. Kumagai*  
JAMES S. KUMAGAI, Ph.D.

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

Dear Dr. Kumagai:

Subject: Keaau-Paho Road, Paho Bypass  
Project No. 130AB-01-76

Thank you for your comment of May 18, 1977 regarding  
the Keaau-Paho Road EIS Preparation Notice. Your comment  
regarding the selection of a route downwind from the town  
will be taken into consideration. We have provided a prelimi-  
nary analysis of the air quality impact and this analysis  
indicates that the difference between the mauka and makai  
by-pass route on air quality will be negligible.

We will be incorporating your comments into the EIS.  
We will also be providing for your information a copy of the  
air quality analysis at the time the EIS is submitted.

Sincerely,  
*E. Alvey Wright*  
E. ALVEY WRIGHT  
Director

E. ALVEY WRIGHT  
DIRECTOR  
STATE DEPARTMENT OF LAND AND NATURAL RESOURCES  
150 FERNBERG STREET  
HONOLULU, HAWAII 96809



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
150 FERNBERG STREET  
HONOLULU, HAWAII 96809

RE MIAT MEIWA TOC  
IT-PA  
2.38272

GEORGE H. ANTIPOUR  
DIRECTOR



DIRECTOR'S OFFICE  
COMMUNISTERS CLUB, GREENWICH  
150 FERNBERG STREET  
HONOLULU, HAWAII 96809  
MAY 26 12 40 PM '77  
STATE OF HAWAII DEPT. OF TRANSPORTATION  
DIVISION OF LAND AND NATURAL RESOURCES  
150 FERNBERG STREET  
HONOLULU, HAWAII 96809

May 25, 1977 Your: IT-PA 2.36738

RECEIVED  
STATE DEPARTMENT  
OF TRANSPORTATION  
MAY 31 1 13 PM '77  
LAND TRANSPORTATION  
FACILITIES DIVISION  
PLANNING BRANCH

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

Subject: Keaau-Paho Road, Paho Road Bypass  
Project No. 130AB-01-76

Thank you for your letter of May 25, 1977 regarding the Keaau-Paho Road EIS Preparation Notice. We regret that the information in the EIS Preparation Notice was not specific enough for your department to comment upon. The EIS now being prepared will contain specific details so that the exact locations and roadway descriptions can be evaluated. We hope that you will comment on the EIS when it is distributed for your review.

If we can provide further information to you or your staff regarding this project prior to the distribution of the EIS, please do not hesitate to contact us.

Sincerely,  
*R. Higa-shioma*  
for E. ALVEY WRIGHT  
Director

GEORGE H. ANTIPOUR  
DIRECTOR



STATE OF HAWAII DEPT. OF TRANSPORTATION  
DIVISION OF LAND AND NATURAL RESOURCES  
150 FERNBERG STREET  
HONOLULU, HAWAII 96809

May 25, 1977

Honorable E. Alvey Wright  
Department of Transportation  
869 Punchbowl St.  
Honolulu, Hawaii 96813

Dear Sir:

Subject: Paho Road Bypass

We are unable to offer comment on the EIS preparation notice for the bypass because of the lack of details.

Very truly yours,

*Gordon Soh*  
GORDON SOH  
Program Planning Coordinator

cc: Forestry  
HONARD

RECEIVED  
MAY 27 1 22 PM '77  
STATE DEPARTMENT OF TRANSPORTATION  
LAND TRANSPORTATION FACILITIES DIVISION  
PLANNING BRANCH

GOVERNMENT



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

DIRECTOR'S OFFICE

MAY 27 11 51 AM '77

DEPT. OF  
TRANSPORTATION

OFFICE OF THE SUPERINTENDENT

MEMO TO: Honorable E. Alvey Wright, Director  
Department of Transportation  
P. O. Box Charles G. Clark, Superintendent  
Department of Education

SUBJECT: Keaau-Pahoa Road, Pahoa Bypass  
Environmental Impact Statement  
Preparation Notice

In response to your letter of April 25, 1977, our Hawaii District Office has reviewed the subject proposal. A copy of their comments is attached.

2-1-4

Attachment

CIVILISED CLAIM  
SUPERINTENDENT

RECEIVED  
STATE DEPARTMENT  
OF TRANSPORTATION  
JUN 2 10 18 AM '77  
LAND TRANSPORTATION  
FACILITIES DIVISION  
PLANNING BRANCH

RECEIVED  
JUN 1 12 55 PM '77  
DEPT. OF TRANSPORTATION  
LAND TRANSPORTATION  
FACILITIES DIVISION



STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
OFFICE OF THE DISTRICT SUPERINTENDENT  
HAWAII KAPAHUA  
78 AUPUNANI STREET  
P. O. BOX 1022  
HILO, HAWAII 96720

1977 MAY 19 #3 11 38

O.E. ANNEX-FACILITIES

May 17, 1977

Mr. Hirohiko Hino  
Facilities & Support Services Branch  
Department of Education  
P. O. Box 2360  
Honolulu, Hawaii 96804

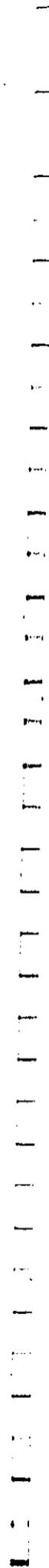
Dear Mr. Hino

Subject: Keaau-Pahoa Road, Pahoa Bypass - Environmental Impact Statement

The Environment Impact Statement for subject project has been carefully reviewed, and we submit our comments as follows:

It appears that the alternative to improve the existing roadway, if pursued, will have the most significant effect upon the community, particularly, the existing small businesses, numerous residences, and likely to perhaps, adversely alter the character of Pahoa Village. The fact that the Pahoa High and Elementary School site is situated at the junction of the Pahoa-Kapahua, Pahoa-Kapoho, and Keaau-Pahoa Roads, any major improvement of the existing roadway will likely severely affect the school as well.

A thorough study has been recently completed of the educational facilities needs at Pahoa; and a development plan of the present school site has been finalized. The studies and development plan have not included major change of the traffic pattern of the road junction, nor a major change of land configuration. Thus, if a major change in traffic pattern and roadway improvement is undertaken, which may encroach upon existing school lands, there is likely a serious effect on the Department of Education's planned project scope, sequence, and total plans.



E. ALVY WRIGHT  
DIRECTOR  
OFFICE OF THE  
STATE ENGINEER  
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
COMBATS G. BUILDING



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
445 KUNIAHONOLUA STREET  
HONOLULU, HAWAII 96813

Mr. Alronolu Hino  
Page 2  
May 17, 1977

Hawaii District Department of Education is not in favor of the improvement of the existing roadway to the proposed standards. We foresee significant disturbance to school room activities with excessive noise, and increase in danger to students who walk to and from school daily.

We recommend that considerations be directed to other alternative plans.

Sincerely,

William A. Waters  
District Superintendent  
WAW:ISH:dy

Mr. Charles G. Clark  
Superintendent  
Department of Education  
P.O. Box 2360  
Honolulu, Hawaii 96804

Dear Mr. Clark:

Subject: Kenau-Pahoa Road, Pahoa By-pass  
Project No. 130AB-01-76

Thank you for your letter of May 17, 1977 transmitting your Hawaii District Office's comments regarding the Kenau-Pahoa Road EIS Preparation Notice. We will incorporate the comments into the EIS. We note that there will be many adverse impacts as it relates to the alternative to widen the existing roadway. Additionally, we note that we will be reviewing the Master Plan for the Pahoa High and Elementary School to evaluate the potential impacts of each alternative on the school. Please be assured that we will give serious consideration to possibly deleting the alternative to improve the existing roadway.

We will be submitting the EIS to the Environmental Quality Commission in the near future and a copy will be provided to your office for your further review and comments.

Sincerely,

E. ALVY WRIGHT  
Director

E. ALVEY WRIGHT  
Director  
WATER RESOURCES  
WALLACE JOHNSON  
STANLEY W. JOHNSON  
DONALD E. JOHNSON  
CHRISTOPHER S. JOHNSON



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
405 FORTCHESNEY STREET  
HONOLULU, HAWAII 96813

IN REPLY REFER TO

LT-PA  
2.38267

July 7, 1977

STANDARD BUSINESS REPLY

United States Department of the Interior  
DIRECTOR'S OFFICE



GEOLOGICAL SURVEY

Water Resources Division  
5th Floor, 1833 Kalaheo Ave. RM 3 12 57 PM '77  
Honolulu, Hawaii 96815

DEPT. OF  
TRANSPORTATION

May 2, 1977

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

Dear Sir:

Subject: Keaau-Pahoa Road, Pahoa Bypass  
Environmental Impact Statement  
Preparation Notice

We have reviewed subject preparation notice and have no comments to offer. No significant effect upon water resources would be expected from whichever alternative corridor is selected.

A-16

Sincerely,

*F. J. Hidaka*  
F. J. Hidaka  
District Chief

cc: Regional Hydrologist, IMD, IIR (Attn: L. E. Hancock)  
OEPP, Washington, D. C.

RECEIVED  
MAY 5 11 28 AM '77  
ST. DEPT. OF TRANS.  
WASHINGTON, D.C.

RECEIVED  
MAY 4 2 10 PM '77  
DEPT. OF TRANSPORTATION  
HIGHWAYS DIVISION

Mr. F. T. Hidaka  
District Chief  
U.S. Department of the Interior  
Geological Survey  
Water Resources Division  
P.O. Box 50166  
Honolulu, Hawaii 96850

Dear Mr. Hidaka:

Subject: Keaau-Pahoa Road, Pahoa Bypass  
Project No. 130AB-01-76

Thank you for your letter of May 2, 1977 stating that the proposed project is not expected to have any significant impact upon water resources.

We will be providing you with a copy of the EIS for your further review and comments.

Sincerely,

*E. Alvey Wright*  
E. ALVEY WRIGHT  
Director



GEORGE H. FORTSON  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
445 PURICHOW STREET  
HONOLULU, HAWAII 96813

E. ALVEY WRIGHT  
DIRECTOR  
STATE DEPARTMENT OF TRANSPORTATION  
445 PURICHOW STREET  
HONOLULU, HAWAII 96813

RECEIVED  
JUL 12 1977  
J.T.P.A.  
2.38268

July 7, 1977

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
P. O. Box 50004, Honolulu, HI 96850

12/27/76 (1977) 77

RECEIVED  
STATE DEPARTMENT OF TRANSPORTATION  
JUL 12 1977  
OFFICE OF THE DIRECTOR  
445 PURICHOW STREET  
HONOLULU, HAWAII 96813

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

Dear Mr. Wright:

Subject: Keaau-Paho Road, Paho Bypass EIS Preparation Notice

We reviewed the subject preparation notice and would like to offer the following comment for your consideration in preparing the draft EIS:

In the potential impacts section of the preparation notice it states that agricultural land will be taken out of production if a by-pass alternative is selected. The DEIS should state the number of acres of agricultural land that will be taken out of production and the impact this will have on the local economy. Also, the DEIS should state if any acreage of prime agricultural lands and other important agricultural lands will be taken by any of the alternatives.

We have enclosed a map showing the locations of the prime agricultural lands and other important agricultural lands that are in the area of concern.

Thank you for the opportunity to review this preparation notice.

Sincerely,

*Jack P. Kanals*  
Jack P. Kanals  
State Conservationist

Enclosure

RECEIVED  
JUL 12 1977  
DEPT. OF TRANSPORTATION  
STATE DEPARTMENT OF TRANSPORTATION  
445 PURICHOW STREET  
HONOLULU, HAWAII 96813

Mr. Jack P. Kanals  
State Conservationist  
Soil Conservation Service  
U.S. Department of Agriculture  
P.O. Box 50004  
Honolulu, Hawaii 96850

Subject: Keaau-Paho Road, Paho Bypass  
Project No. 130AB-01-76

Thank you for your comments regarding the Keaau-Paho Road EIS Preparation Notice. At this time we are aware of the potential impact a makai or mauka by-pass route would have on sugar cane production. Based on our information, the makai (easterly) route will displace a greater amount of sugar cane lands than the mauka (westerly) route. We are in the process of preparing a socio-economic study which will specifically show the displacement of agriculture, both sugar cane and diversified, and address the impacts this will have on the local economy.

Your comments will be incorporated into the EIS presently being prepared. This EIS will be distributed to your office for your further review and comments.

Sincerely,

*E. Alvey Wright*  
E. Alvey Wright  
Director

2-1-80

RECEIVED  
 MAY 9 4 01 PM '77  
 UNIVERSITY OF HAWAII  
 DEPT. OF TRANSPORTATION  
 FACILITIES DIVISION  
 MAY 3, 1977  
 DIRECTOR'S OFFICE  
 DEPT. OF TRANSPORTATION  
 FACILITIES DIVISION  
 MAY 3, 1977

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

Subject: Keana-Pahoa Road, Pahoa Bypass  
 Environmental Impact Statement  
 Preparation Notice

We have reviewed the EIS preparation notice and have no comment to make at this time.

Sincerely,

*Reginald H. E. King*  
 Reginald H. E. King  
 Asst. Director, URRC

RMF:jm

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION

GEORGE D. ALVESHIM  
DIRECTOR



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

June 29, 1977

E. ALVEY WRIGHT  
DIRECTOR  
805 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813  
CHARLES B. SALAMON  
DIRECTOR

BY MAIL REFER TO:  
LT-PA  
2.38274



DIRECTOR'S OFFICE  
UNIVERSITY OF HAWAII at Manoa  
8 05 11 77  
DEPT. OF TRANSPORTATION  
College of Tropical Agriculture  
Hawaii Agricultural Experiment Station  
Hilger Hall 238 • 2545 The Mall  
Honolulu, Hawaii 96822

RECEIVED  
MAY 23 9 16 AM '77  
OFFICE OF THE ASSOCIATE DIRECTOR  
DEPARTMENT OF TRANSPORTATION

May 13, 1977

Office of the Associate Director

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

Dear Mr. Wright:

Subject: Keolu-Pahoia Road, Pahoia Bypass Environmental Impact Statement Preparation Notice

I am responding on behalf of the College of Tropical Agriculture, University of Hawaii, to your letter of April 25, 1977, on the above subject.

Amongst the alternatives, the College believes that the east-west route would be more advantageous to agriculture because there are citrus, nutrium and papaya farms makai of the village of Pahoia. However, the difference between the makai and mauka routing is not seen to be great.

We do not believe that the existing road should be used.

Yours sincerely,

*William R. Furtick*

William R. Furtick  
Dean and Director

RECEIVED  
STATE DEPARTMENT  
OF TRANSPORTATION  
MAY 25 2 18 PM '77  
LAWYER DIVISION  
PLANNING BRANCH

Mr. William R. Furtick  
Dean and Director  
College of Tropical Agriculture  
Hilger Hall 238  
2545 The Mall  
Honolulu, Hawaii 96822

Dear Mr. Furtick:

Subject: Keolu-Pahoia Road, Pahoia Bypass Project No. 130AB-01-76

Thank you for your letter of May 13, 1977 regarding the Keolu-Pahoia Road EIS Preparation Notice. We have reviewed your comments and will incorporate these comments into the EIS and in our evaluation of the alternative corridors. We would also like to note that we are preparing a socioeconomic report which specifically discusses the agricultural impact of each alternative. This information will be presented in the EIS.

A copy of the EIS will be submitted to your office for review and further comments.

Sincerely,

*R. H. Wright*

R. H. Wright  
Director

AN EQUAL OPP. UNITY EMPLOYER



DIRECTOR'S OFFICE

RECEIVED  
MAY 11 3 22 PM '77  
UNIVERSITY OF HAWAII

University of Hawaii at Manoa  
Hawaii 96822

Environmental Center  
Crawford 317 - 7240 Campus Road  
Honolulu, Hawaii 96822  
Telephone (808) 944-7240

Office of the Director

May 23, 1977

Mr. E. Alvey Wright  
Director  
Department of Transportation  
865 Puuikui Street  
Honolulu, Hawaii 96813

Dear Mr. Wright:

Kaau-Palms Road, Palms Bypass  
Environmental Impact Statement  
Preparation Notice

The Environmental Center of the University of Hawaii does not, in general, participate in the preparation stage of the Environmental Impact Statement process. We have taken this position so as not to be in conflict with our later review responsibilities, nor in apparent competition with private consultants.

Certainly we are available for consultation on an informal basis. However, formal review comments will be limited to the EIS.

Yours very truly,

*Richard C. Cox*  
Richard C. Cox  
Director

RECEIVED  
STATE DEPARTMENT  
OF TRANSPORTATION  
MAY 31 1 12 PM '77  
LAND TRANSPORTATION  
FACILITIES DIVISION  
PLANNING BRANCH



GEORGE D. ALVESH  
Director



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
805 Punchbowl Street  
Honolulu, Hawaii 96813

June 28, 1977

BY MAIL WITH ID.  
JF-PA  
2-38270

HAWAIIAN TELEPHONE COMPANY

P.O. BOX 475 - HILLO, HAWAII 96720 (TELEPHONE 935-9111) - CABLE: HELLHAWAII

RECEIVED  
STATE DEPARTMENT  
OF TRANSPORTATION  
MAY 23 10 54 AM '77  
LAND TRANSPORTATION  
FACILITIES DIVISION  
PLANNING BRANCH

State of Hawaii  
Dept. of Transportation  
805 Punchbowl Street  
Honolulu, HI. 96813

Gentlemen:

Subject: Keaau-Pahoia Road, Pahoia Bypass EIS Preparation Notice  
JF-PA 2-38270

This is to acknowledge receipt of the subject Notice and to offer the

of the five alternate corridors, only the proposal to improve the existing roadway will have any appreciable effect on existing telephone facilities paralleling Route FAS 170. We also wish to advise you that, because the relocation of our facilities will be a major undertaking and will require the use of non-stock cables with order to delivery lead times of from 6 to 8 months, we will require at least 18 months to budget for, order material, engineer and complete the relocation work.

212

Yours Truly,

*[Signature]*  
Hisashi Enomoto  
Supervising Engineer

HE/IA

Mr. Hisashi Enomoto  
Supervising Engineer  
Hawaiian Telephone Company  
P.O. Box 425  
Hilo, Hawaii 96720

Dear Mr. Enomoto:

Subject: Keaau-Pahoia Road, Pahoia Bypass  
Project No. 130AB-01-76

Thank you for your comments of May 18, 1977 regarding the Keaau-Pahoia Road EIS Preparation Notice. We will incorporate your comments into the EIS especially as it concerns the alternative to widen the existing road. Should there be any relocation of HAWTEL's facilities, we will be contacting you at the appropriate time.

You will be receiving a copy of the EIS which is presently being prepared for your further review and comments.

Sincerely,

*[Signature]*  
for F. ALVESH  
Director

AIR QUALITY ASSESSMENT  
FOR  
KEAAU-PAHOA, PAHOA BY-PASS, FAS 130  
Project No. 130AB-01-76  
Island of Hawaii

By  
BARRY ROOT, M.A., M.P.H.  
Air Pollution Consultant

May, 1977

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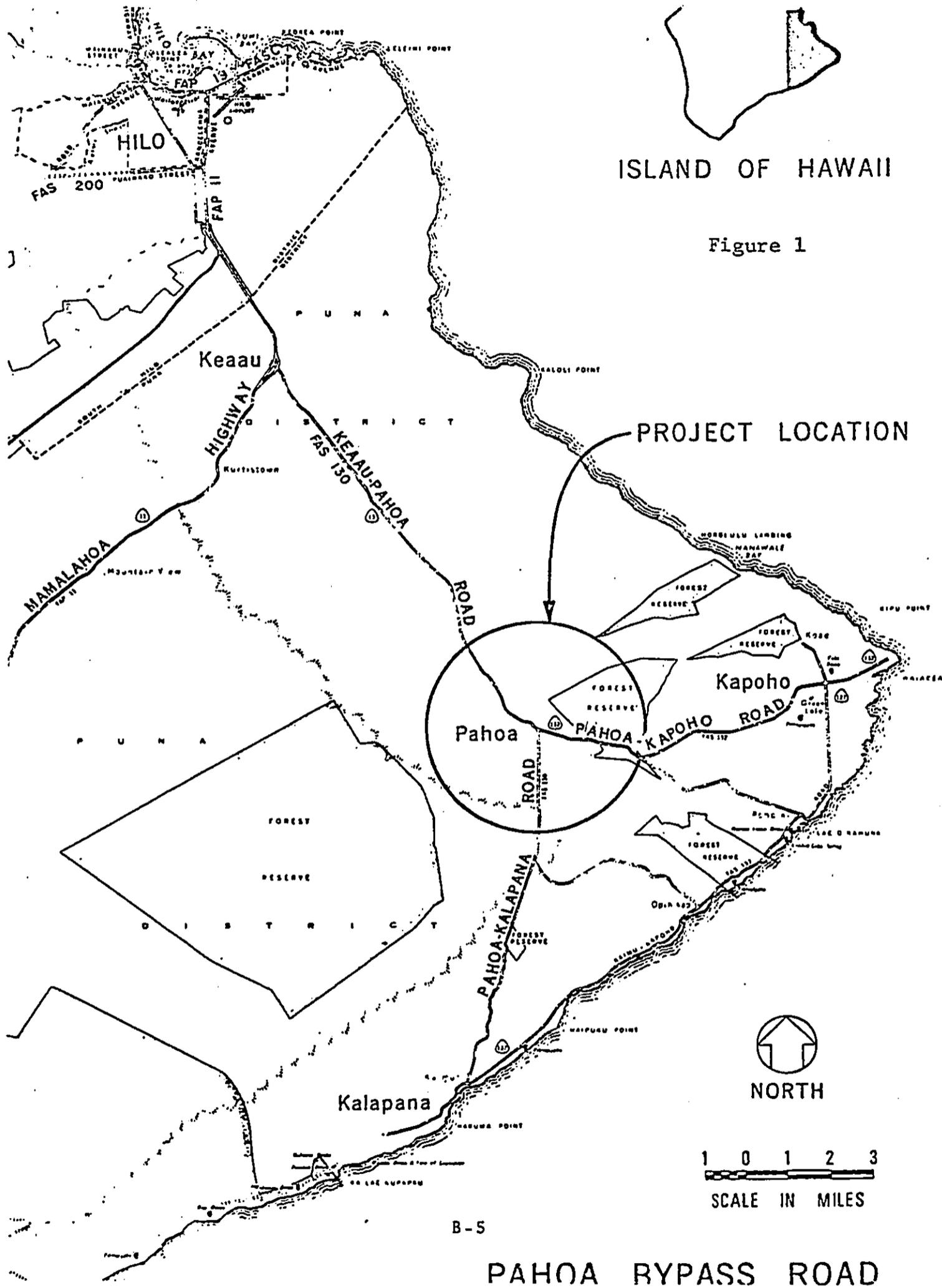
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## INTRODUCTION AND PROJECT DESCRIPTION

The proposed project is located in the Puna District in the vicinity of Pahoia Village on the Island of Hawaii (Figure 1). The existing roadway under consideration for improvement is a portion of the Keaau-Pahoia-Kalapana Road (Route FAS 130) from a point near the intersection with Kahakai Boulevard to approximately 2.8 miles south of the Pahoia-Kapoho-Kalapana Junction.

The intent of the project is to improve the section of Route 130 which goes through Pahoia Village. Of particular concern is the 1.5 mile portion starting from Kahakai Boulevard to the Pahoia-Kapoho-Kalapana Junction. Five alternative corridors are being considered: two by-pass corridors located mauka (west) of the existing roadway; two by-pass corridors located makai (east) of the existing roadway; and a corridor following the existing roadway through Pahoia Village.

The purpose of this study is to assess the air quality impacts that are likely to occur as a result of the various alternatives under consideration. One of these alternatives, of course, is to do nothing at all. From an air quality standpoint, this alternative would be almost the same as improving the existing roadway through Pahoia Village since the same number of mobile emission sources traveling over the same route would be involved. In reality, there would be some subtle differences in air quality at the microscale level between these two alternatives because vehicles traveling over an improved route through Pahoia Village could presumably operate more efficiently and at a more uniform rate of speed than is currently possible over the existing roadway. Thus air pollutant emissions from automobiles traveling over an improved roadway could be expected to be somewhat lower than those that would occur if the roadway is not improved. On the other hand, expanding the width of the existing roadway could serve to place automobile pollutant sources closer to potential roadside



ISLAND OF HAWAII

Figure 1

PROJECT LOCATION



NORTH

1 0 1 2 3

SCALE IN MILES

B-5

PAHOA BYPASS ROAD

receptors thus increasing exposure to air pollution for some of the inhabitants of Pahoa Village. In any case, the difference between these two alternatives in air quality terms would be slight and any choice between them should be based on considerations other than air quality. For this study the "without by-pass" alternative will be taken to mean a route through Pahoa Village over either the existing or an improved roadway.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

## AMBIENT AIR QUALITY STANDARDS

State of Hawaii and Federal Ambient Air Quality Standards for the six major ambient air pollutants are shown in Table 1. Federal standards are based on 40 Code of Federal Regulations, Part 50, and Hawaii Standards are based on State of Hawaii Public Health Regulations, Chapter 42. A brief objective for each of the standards is also shown for all pollutants except hydrocarbons. The standard for hydrocarbons is not based on direct human health effects. Hydrocarbons play a major role as precursors to the formation of photochemical oxidants and smog. The progress of these secondary reactions in the atmosphere depends to a certain degree on early morning levels of hydrocarbons and the three hour time period for which the standard applies is usually taken to be 0600-0900 local time.

For all the pollutants shown in Table 1, State of Hawaii ambient air quality standards are substantially more stringent than Federal limits.

TABLE 1

## STATE OF HAWAII AND FEDERAL AMBIENT AIR QUALITY STANDARDS

Pollutant		Federal Standards		State Standards	Objective
		Primary	Secondary		
1. Suspended Particulate Matter ( $\mu\text{g}/\text{m}^3$ )	Annual Geometric Mean	75	60		To prevent health effects attributable to long continued exposure.
	Annual Arithmetic Mean	-	-	55	
	Maximum Average in Any 24 Hours	260	150	100	
2. Sulfur Dioxide ( $\mu\text{g}/\text{m}^3$ )	Annual Arithmetic Mean	80	-	20	To prevent pulmonary irritation and odor.
	Maximum Average in Any 24 Hours	365	-	80	
	Maximum Average in Any 3 Hours	1300		400	
3. Carbon Monoxide ( $\text{mg}/\text{m}^3$ )	Maximum Average in Any 8 Hours		10	5	To prevent interference with the capacity of the blood to transport oxygen.
	Maximum Average in Any 1 Hour		40	10	
4. Hydrocarbons non-methane ( $\mu\text{g}/\text{m}^3$ )	Maximum Average in Any 3 Hours		160	100	-
5. Photochemical Oxidants ( $\mu\text{g}/\text{m}^3$ )	Maximum Average in Any 1 Hour		160	100	To prevent eye irritation and possible impairment of lung function in persons with chronic pulmonary disease, and to prevent damage to vegetation.
6. Nitrogen Dioxide ( $\mu\text{g}/\text{m}^3$ )	Annual Arithmetic Mean		100	70	To prevent possible risk to public health and atmospheric discoloration.
	Maximum Average in Any 24 Hours			150	

Source: State Department of Health, Hawaii Air Quality Data. Environmental Health Division, Air Sanitation Branch, February 20, 1973.

### EXISTING AMBIENT AIR QUALITY LEVELS

The nearest State of Hawaii Department of Health air quality monitoring station is located in Hilo about 20 miles northwest of the project site. The Hilo area is far more urbanized than this project site but a summary of air quality measurements for Hilo is shown in Table 2 in order to give an idea of existing air quality on the Island of Hawaii. Unfortunately, carbon monoxide and hydrocarbons are not measured. For all pollutants measured both maximum and annual average values are below State ambient air quality standards.

TABLE 2

EXISTING AMBIENT AIR QUALITY LEVELS AT HILO (SUMMARY - 1975)

<u>Pollutant</u>	<u>Minimum<sup>a</sup></u> ( $\mu\text{g}/\text{m}^3$ )	<u>Maximum<sup>a</sup></u> ( $\mu\text{g}/\text{m}^3$ )	<u>Annual Average</u>
Particulate Matter	12	89	30
Sulfur Dioxide	<5	32	<5
Nitrogen Dioxide	<20	29	16

<sup>a</sup> for a 24 hour period

SOURCE: State of Hawaii, Department of Health

#### SHORT-TERM PARTICULATE EMISSIONS

During the construction phase of the project the pollutant of primary concern will be suspended particulate matter. Emission rates for particulates will vary depending on the amount of cutting, filling, and grading required. Since these activities are costly in terms of time and money as well as air pollutants generated, it is likely that the final route selected will be designed to keep these activities to a minimum.

Specific mitigation measures that can be employed to minimize the amount of particulates generated by construction activities include watering work areas, use of dust palliatives, restricting the area of operation, paving of construction lanes, disposing of debris by methods other than burning, and, if necessary, curtailing activities during dry, high wind conditions.

In this regard a by-pass route running mauka of the existing roadway would be preferable since prevailing northeast trade winds would tend to carry wind blown particulates away from Pahoa Village rather than towards it as would be the case for a makai by-pass route. Even on days of very weak or no trade winds, the prevailing secondary wind systems in the area (daytime sea breezes and upslope winds) would tend to carry suspended particulates in a mauka direction during prime construction hours.

## VEHICULAR SOURCES OF AIR POLLUTANTS

The primary air pollutants emitted by motor vehicles are carbon monoxide (CO), hydrocarbons (HC), and nitrogen oxides (NO<sub>x</sub>). Of these the hydrocarbons and nitrogen oxides react under the influence of sunlight in the atmosphere to produce photochemical oxidants, or smog. The rate at which these atmospheric reactions occur depends on many factors and it is not now possible to predict expected down-wind concentrations of photochemical oxidants using simple models of atmospheric pollutant dispersion. Carbon monoxide, on the other hand, is relatively stable and several methods of assessing down-wind concentrations of CO using mathematical models have been developed. As it turns out, CO is also the most abundant of the pollutants generated by motor vehicles and a thorough analysis of CO impact provides a very good indicator of the environmental acceptability of any proposed highway project.

Following the mandate of the National Environmental Policy Act of 1969, and pursuant policies issued by the U.S. Environmental Protection Agency (EPA) in their Guidelines for Review of Environmental Impact Statements, Volume 1: Highway Projects mathematical analysis of highway air pollution impact should include investigation at two levels: (1) an area-wide (mesoscale) analysis and (2) a highway corridor (microscale) analysis.

## MESOSCALE EMISSIONS ANALYSIS

Measured and predicted traffic loadings for the project area are explained in Appendix A and presented in map form in Figure A-1. In this particular depiction one mauka by-pass route is shown. Existing (1976) traffic levels are indicated along with forecasts for 1980, 1990, and 2000. Values shown are average daily traffic (ADT). About 9% of this daily traffic is expected to occur during morning peak hour at which time about 55% of the roadway traffic will be traveling in the Hilo direction (toward the north). Trucks or other non-automobile vehicles are expected to constitute about 11% of the morning rush hour traffic.

Other assumptions used for the traffic forecasts are detailed in Appendix A.

A map showing proposed alternatives is included as Appendix B. Since alternative B and D have been recommended for deletion the remainder of the study will focus on alternatives A (makai by-pass), C (no by-pass), and E (mauka by-pass). If the beginning of the project area is taken to be the point near Kahakai Boulevard where the by-pass routes begin and the end to be the point where alternative E joins the Pahoa-Kalapana Road, the project area includes about 2 route miles no matter which of the alternatives is selected.

Predicted mesoscale emissions in the project area are shown in Table 3. Air pollutant emission factors are from EPA, Compilation of Air Pollutant Emission Factors, Appendix D, Table D.7-1, December, 1975.\* Emission factors are assumed to remain unchanged between 1990 and 2000 since no emission rate forecasts are available for that time period. The emission factors shown are probably high for the Pahoa area since they are based on average vehicle speeds at about 20 mph and a vehicle mix containing 80% automobiles.

From Figure 2 it can be seen that for CO and HC highest total mesoscale emissions are expected to occur in 1980 (or earlier), while NO<sub>x</sub> concentrations are likely to surpass 1980 values for the years following 1995.

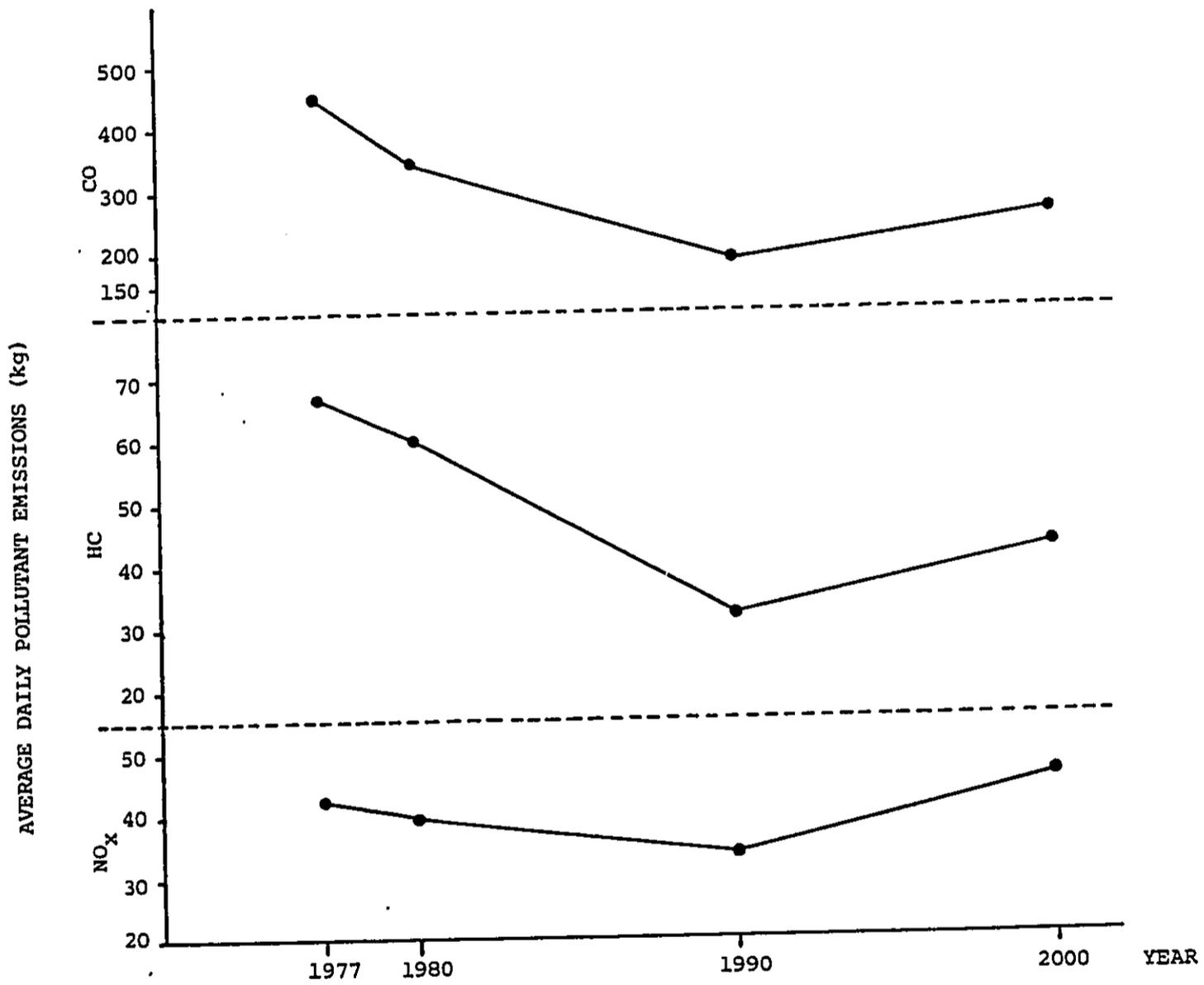
\* Contained in Supplement 5.



FIGURE 2

AVERAGE DAILY POLLUTANT EMISSIONS (kg) BY YEAR  
FOR PAHOA AREA

(Alternatives A, C, or E)



To assess the potential impact of these emissions consider this highly unlikely worst case situation: Assuming a mesoscale impact area only 1.5 miles long and 0.5 miles wide and an all day temperature inversion at an average height of only 10 meters above the ground with a windspeed of just 0.5 m/sec in the crosswind direction the 46 kg of NO<sub>2</sub> predicted for the route through Pahoia Village would produce ambient concentrations of only 44 µg/m<sup>3</sup> for a 24 hour worst case value. This further assumes no atmospheric reactions with other pollutants that would tend to decrease this concentration. This worst case predicted mesoscale value is far below the State of Hawaii 24 hour standard of 150 µg/m<sup>3</sup>.

## MICROSCALE CARBON MONOXIDE ANALYSIS

### Methodology and Assumptions

The microscale carbon monoxide analysis is based on a technique described in EPA's Guidelines for Air Quality Maintenance Planning and Analysis Volume 9: Evaluating Indirect Sources. There are several inherent assumptions in the procedure:

1. Motor vehicle emission rates are based on a 1975 vehicles mix containing 88% automobiles, with 20% of all vehicles operating under "cold start" conditions at low altitude with outside air temperatures between 68 and 86 degrees F. These values are consistent with the situation at Pahoa.
2. A worst case wind direction and speed (1 m/sec) with atmospheric stability category D are assumed for diffusion calculations. These are the least favorable meteorological conditions from an air pollution standpoint that are likely to occur in the daytime in an urbanized area. The Pahoa project site is highly rural in nature and could experience more stable atmospheric conditions than would be expected in an urban area. For that reason stability category F was assumed (the most stable condition) and CO concentrations predicted by the method for stability category D were doubled to reflect the higher values that would occur under category F.
3. Computed CO concentrations are determined using a set of graphs the interpretation and interpolation of which limits precision of results for any given receptor site to about  $\pm 0.5$  mg/m<sup>3</sup>. Because of the doubling mentioned above receptor site results reported here may have a precision of only  $\pm 1$  mg/m<sup>3</sup>.

For all calculations an existing background CO concentration of zero was

assumed since motor vehicles are the primary CO sources in the project area.

It was assumed that worst case traffic conditions would occur during morning rush hour with traffic parameters as described in Appendix A and in the preceding section on mesoscale analysis. All roadways were assumed to have a capacity of at least 600 vehicles per lane per hour at Level of Service E and all were assumed to be at grade.

#### Results

Receptor sites were selected to coincide with locations for which traffic forecasts were made (see Figure A-1). Site 1 is located immediately adjacent to the Keaau-Paho Road at a point before it enters the village and before the intersection with the proposed by-pass road. Traffic and CO forecasts for this site are not dependent on whether the by-pass is constructed or not. This site was selected for analysis because the traffic loadings on this roadway segment <sup>are</sup> was currently the highest in the project area and are predicted to remain so through the year 2000. Peak hour CO concentrations at this site are expected to reach about 5 mg/m<sup>3</sup> by the year 2000. This value is just about half the allowable State 1-hour CO Standard. To estimate the 8-hour average, the EPA Guidelines suggest that multiplying the one-hour estimate by a "meteorological persistence factor" of 0.6 is a viable approach. In that case the 8-hour average would be about 3 mg/m<sup>3</sup> which is still substantially below the allowable State of Hawaii 8-hour limit of 5 mg/m<sup>3</sup>. Since this roadway has the highest traffic levels in the project area it seems reasonable to conclude that all other roadways in the project area will also have associated CO concentrations that are well below allowable State limits. This will be the case whether the project is undertaken or not.

Site 2 is located immediately adjacent to the roadway along the proposed by-pass. By the year 2000 peak morning CO concentrations at this site are expected to reach only about 1 mg/m<sup>3</sup>. This is substantially below allowable State limits for either one hour or eight hours. At about 50 meters from the

roadway CO concentrations would be only about half those reported immediately adjacent to the traffic lanes. These values are valid for all points along the proposed by-pass no matter where it is located. It is important to note, however, that carbon monoxide from a mauka by-pass is more likely to blow away from Pahoa Village while that from a makai by-pass would more likely blow toward the village because of the prevailing northeasterly trade winds.

Site 3 is located immediately beside the roadway near the center of Pahoa Village. If a by-pass is constructed reduced traffic through the middle of the village will result in substantially lowered carbon monoxide concentrations along the sidewalks and store fronts. But even without a by-pass peak hour CO concentrations are not likely to exceed allowable State Standards even by the year 2000.

Site 4 is located immediately adjacent to the intersection of Keaau-Pahoa Road and Pahoa-Kalapana Road near the school. For this site calculations for all three options were carried out. As it turns out, there is no difference in projected carbon monoxide values between the no by-pass option and the makai by-pass option. Construction of the mauka by-pass could result in a slightly lower expected value of carbon monoxide for all years considered. Each of the calculations assumed that traffic would be controlled by stop signs on both of the intersecting roadways. A downstream speed of 25 mph was assumed for vehicles leaving the intersection. As shown in Table 4, CO values at Site 4 are expected to be well below allowable State limits through the year 2000 no matter which of the project options is undertaken. Carbon monoxide values slightly higher than those shown for the makai by-pass option might occur at this site if a traffic signal light is installed at the Pahoa Road intersection on some future date, but even in that situation CO values are not likely to exceed allowable standards.

TABLE 4  
MORNING PEAK HOUR CARBON MONOXIDE CONCENTRATIONS (mg/m<sup>3</sup>) UNDER WORST  
CASE CONDITIONS AT SELECTED RECEPTOR SITES<sup>a</sup>

Receptor Site	Route	Year				State of Hawaii Standard	Federal Standard
		1976	1980	1990	2000		
1	With or Without Bypass	3.4	2.4	2.0	4.8	10	40
2	Bypass	-	1.0	1.0	1.2	10	40
3	With Bypass	-	1.2	1.0	1.4	10	40
	Without Bypass	2.8	3.0	2.6	5.2	10	40
4	With Mauka Bypass	-	2.6	1.8	2.2	10	40
	Without Bypass	6.0	3.0	2.0	2.6	10	40
	With Makai Bypass	-	3.0	2.0	2.6	10	40

<sup>a</sup> See Figure A-1 for location of receptor sites

B-20

## CONCLUSIONS

Air pollution concentrations in the Pahoa area are not expected to exceed any of the State of Hawaii ambient air quality standards through the year 2000 no matter which of the alternatives for this project is undertaken. Even the "do nothing" alternative is viable from an air quality standpoint. Based on calculations contained in the report, however, construction of either by-pass route results in lower projected carbon monoxide levels along the Keauu-Pahoa Road through the center of Pahoa Village.

Considering air quality alone, a mauka by-pass would be preferable to a makai by-pass since the makai by-pass will represent an upwind source of air pollutants during both construction and operation, but the projected difference between these two options is slight and the final decision on route alignment should be based on factors other than air quality.

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APPENDIX A

TRAFFIC ASSIGNMENT TA 76-7, REVISED

PAHOA BY-PASS ROAD, FAS 130  
Project No. 130AB-01-76  
Island of Hawaii

March 1977

Purpose

Data from this traffic assignment project, as requested by LT-PA, will be used for planning studies.

Data Requested

- |                       |        |
|-----------------------|--------|
| 1. 1976 Ground Counts | 5. K   |
| 2. 1980 ADT           | 6. D   |
| 3. 1990 ADT           | 7. T   |
| 4. 2000 ADT           | 8. T24 |

Basic Conditions

1. Traffic diversion will be based on the following speeds:  
Existing Pahoa Road - 25 mph  
Proposed By-Pass Road - 45 mph
2. Two connectors to be provided between the existing Pahoa Road and the proposed By-Pass Road.

Basic Assumptions

1. Chain of Craters Road assumed to be reconstructed by 1980, enabling circuitous tourist trips.
2. Traffic volumes and design factors to be based on current traffic data taken in the study area.
3. The beach area between Kaimu and Kalapana is zoned for resort land use, but as of now, no developments have been announced. Therefore, any new developments of normal size have been accounted for by the normal growth factor.
4. Route FASC 137 from Kapoho Road to Lehia Park will not be reflected as an improved facility for all years traffic is forecasted in this study. Therefore, no traffic was diverted from Keaau-Pahoa Road to Route FASC 137.

  
Planning Survey Engineer

oo(3/4/77 Rev.)

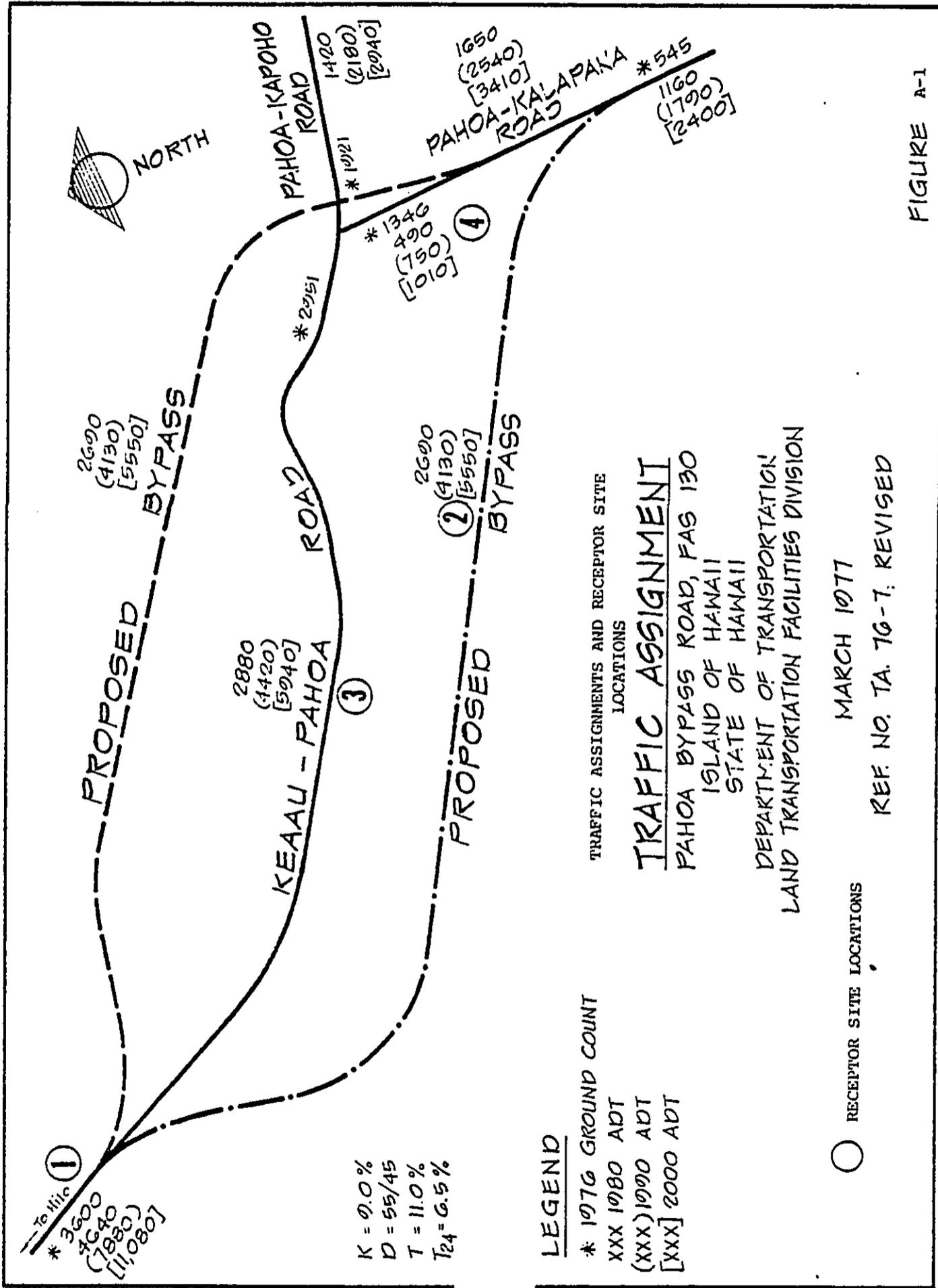


FIGURE A-1

NOISE STUDY OF  
KEAAU-PAHOA ROAD, PAHOA BY-PASS  
PAHOA, HAWAII  
D.O.T. PROJECT NO. 130AB-01-76

July 15, 1977

Submitted to  
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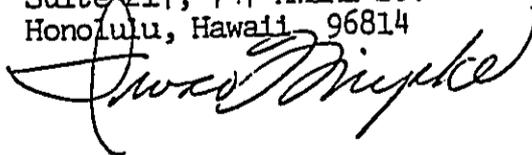


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## OBJECTIVE:

This study was undertaken:

1. To determine the existing and future vehicular traffic noise levels on existing Pahoa Road, Kalapana Road, and the proposed mauka and makai by-pass roads (A) and (E).
2. To evaluate the impact of the vehicular traffic noise on the Pahoa Community and Pahoa High School, and
3. To recommend measures to reduce the noise level where the level is found to be excessive.

## INTRODUCTION:

The Keaau-Pahoa Road runs approximately north-west from Pahoa Village towards Hilo Hawaii. The Pahoa-Kapoho Road runs approximately east from the east edge of the Village. The Pahoa-Kalapana Road runs approximately south from the east edge of the Village. (Figure 1). The width of the existing road through Pahoa Village varies between 16 feet and 34 feet. In most areas it is approximately 20 feet wide. The posted speed is 30 mph through the residential area, 25 mph through the commercial area and 20 mph through the school area.

Of the properties abutting the roadway, approximately 44.8% are zoned residential, 30.4% are zoned commercial and 24.8% are zoned agricultural.

### Noise Measurements

Noise measurements were taken at eleven selected locations along Pahoa Road and along the proposed by-pass roads (A) and (E).

A continuous 24 hour noise reading was taken in front of Pahoa High School (Location 11) which is located between Homestead Road and Kalapana Road. The microphone was placed 86 feet from Pahoa Road, 90 feet from Homestead Road and 135 feet from Kalapana Road. (Figure 3). At each of the selected sites, the noise level was measured at intervals of approximately two hours from 7 am to 6 pm on May 29 and 30. At each site, the noise level was measured every 10 seconds until a 90 to 95% confidence level was obtained.

The noise level inside the faculty lounge was also measured every half an hour from 7 am to 4 pm. The faculty lounge is located near the middle of building (A) (See figure 3) and is similar to classrooms, except for size.

### Instrumentation

The following equipment were used for the noise survey and analysis:

1. B & K Precision Sound Level meters - 2203, 2206 and 2209.
2. B & K Calibrators 4220 and 4230.
3. B & K Graphic Level Recorder 2305.
4. B & K Statistical Distribution Analyzer 4420.
5. Sony Professional Tape Recorder 770-2.

The calibration of each equipment was checked before and after each measurement period.

## GENERAL DISCUSSION

The sound pressure level generated by any noise source can be readily measured to determine its intensity, frequency components and the duration of the noise. However, the above does not tell us much about the effect noise might have on people.

Much research has been conducted on the reaction of people to noise. It is generally agreed that the reaction of people to noise is not the same for all people. In other words, two persons may react differently to the same noise. Studies on why people complain have shown that the most often cited reasons are:

1. interference with rest and recreation,
2. interference with speech communication,
3. interference with radio and music listening and
4. interference with sleep.

The severity of the complaints is associated with a combination of the following factors:

1. The nature of the noise spectrum. (frequency content, amplitude)
2. The loudness and duration of the noise.
3. The time of occurrence. (day, evening, night)
4. The number of occurrences per day.
5. The loudness of the noise above the ambient noise.
6. The activity the person happens to be engaged in when the noise intrusion takes place.
7. The health and noise exposure history of the person.

Because the reaction of the people to noise is subjective, a condition of no complaint to noise should not be expected. Studies on reaction of people have shown that approximately 10 percent of the population are apparently supersensitive to noise and would object to any noise, except those of their own creation. The remaining 90 percent reacted in various degrees to noise. Approximately 25 persons out of 100 tolerated noise of any level. A large majority of the remaining 65 percent did not complain until the indoor noise level exceeded 56 dBA for more than 10 percent of the exposure time. This means, for light weight structures such as those found in Hawaii, the outdoor  $L_{10}$  value should not exceed 66 dBA. For concrete and masonry structures the outdoor  $L_{10}$  noise level can be as much as 68 dBA. Complaints are expected to increase rapidly as the noise level exceeded these limits.

The outdoor  $L_{10}$  noise level recommended by the U.S. Dept. of Transportation in "Policy and Procedure Memorandum 90-2", is 70 dBA for land use category B which includes residences, motels, schools, churches, and hotels. (Table 8).

The Department of Housing and Urban Development (HUD) on the other hand, considers any area where the outdoor noise level exceeds 65 dBA for eight (8) hours per 24 hours, normally unacceptable for housing use. (Table 9).

## NOISE IMPACT

In evaluating the impact of traffic noise in a community, it is important to consider differences in the response of people to daytime and night-time noise. In most homes, the daytime (7 am to 10 pm) activities will increase the noise levels in the home. This self generated noise will mask out or partially mask out most of the intruding exterior noise. Experience has shown that most people will not complain until the intruding noise level becomes 5 or more dB higher than the ambient noise level in the home. At night-time (10 pm to 7 am), the self generated noise drops rapidly. This can make a noise hardly audible during the daytime annoying at night-time.

In other words, a tolerable daytime noise can become intolerable at night-time. This means that noise impact evaluation based on a single number criterion such as  $L_{10}$  equals 70 dBA, recommended in U.S. Transportation Department's PFM 90-2, can be unrealistic. For a rural community it would, perhaps, be more realistic to use HUD's criterion.

Consideration must also be given to the fact that vehicular noise will decrease as manufacturers meet the noise reduction regulations of Environmental Protection Agency (EPA). By 1978, most manufacturers will be able to reduce automobile noise by 6 dBA and truck noise by 10 dBA. This alone is expected to reduce the traffic noise level by 6 to 9 dBA by 1990 when most of the existing noisy vehicles would be replaced or junked.

## CALCULATION OF FUTURE NOISE LEVELS

Since the past or current hourly traffic count was not available, only the peak hour noise level was computed, using the equations and methods recommended in the National Cooperative Highway Research Program (NCHRP) Report 117, Highway Noise, "A Design Guide for Highway Engineers".

To test the applicability of the equations and methods recommended in NCHRP Report 117 to local conditions, traffic count and speed were taken simultaneously with the traffic noise. The measured noise level was compared with the calculated noise level using the method recommended by NCHRP Program Report 117. The results are shown in table 6. The results show that the equations and methods recommended in the NCHRP Report 117 can be used for this study. The equations used are shown in Appendix A. The AM and PM peak hour noise levels 100' from the center line of the nearest lane were calculated for years 1976, 1977, 1980, 1990 and 2000. The results are shown in table 1. Table 2 shows the noise levels at the same distance if no by-pass road is constructed.

Since most of the residences abutting Pahoa Road are approximately 50 feet from the nearest curb, the noise levels at this distance were also calculated. The results are shown in tables 4 and 5.

To determine the impact of traffic noise on classroom activities, noise measurements were taken inside the faculty lounge of Pahoa High School

with jalousie windows open. The measured noise levels and the noise levels expected in other classrooms are shown in table 7.

To determine the impact of the proposed makai by-pass (A) and mauka by-pass (E), the existing noise at two locations along the proposed path of each by-pass road was measured (Table 3). The future noise level on the by-pass road was also calculated. The results are shown in tables 1 and 4. Table 1 shows the noise levels 100' from the center line of the nearest lane. Table 4 shows the noise levels 50' from the nearest curb.

To show the traffic noise impact on Pahoa Village if no by-pass road is built, the noise levels expected in the future at 100' and 50' from the nearest curb were calculated. The results are shown in tables 2 and 5.

## EVALUATION OF NOISE IMPACT

### Noise Criterion

The U.S. Department of Transportation recommends  $L_{10} = 70$  dBA for land use category B which includes, among others, residences, schools, and churches. (Table 8). The U.S. Department of Housing and Urban Development (HUD), on the other hand, classifies an area where the noise level exceeds 65 dBA for more than 8 hours per 24 hour period as "discretionary - normally unacceptable". (Table 9).

Of the two criteria, the HUD criterion is more realistic for this study. It would, therefore, influence the conclusions and recommendations.

### Existing Noise

The existing noise level was measured a hand held meter at eleven selected sites, 1 through 11, shown on figure 2. A continuous 24 hours reading was also taken at station 11. The result of the 24 hour reading is shown in figure 4. Table 3 shows the noise readings taken on the hand held meters.

A glance at table 3 and figure 4 will show that the existing traffic noise is well below the Department of Transportation's and HUD's noise criterion in all areas. Based on the above criteria, all of Pahoa Village, at present, falls into the normally acceptable noise category. However, based on the Department of Education's noise criterion of 55 dBA, the existing noise level inside the east end classrooms of building (A) and building (B) is unacceptable. (Table 7).

### Future Noise

Future noise levels may be evaluated by comparing it with the current noise level, or by comparing it with either the U.S. Department of Transportation's criterion  $L_{10} = 70$  dBA, or HUD's criterion on acceptable noise level.

Although it does not apply to the County of Hawaii, the State Board of Health's noise regulation, "Community Noise Central for Oahu," Chapter 44B, should also be considered in the evaluation. The regulation requires

the State or the County which is implementing the road improvement, must provide measures to reduce the noise level inside a school, church, hospital or convalescent home abutting the roadway to 50 dBA or less, regardless of whether the noise before the improvement was above that level. In view of this, the State Department of Transportation should expend every effort to at least, prevent the existing noise level from increasing in schools and churches.

#### NO BY-PASS ROAD - IMPROVE EXISTING ROAD

One alternative of the proposed road improvement program is to improve the existing Pahoa Road (Alternate C).

A study of table 2 and table 5 show that the current peak hour noise level already exceeds the recommended  $L_{10} = 70$  dBA criterion. If no by-pass road is constructed, the noise level along Pahoa Road will increase approximately 16 dBA by year 2000. This means that the noise will be over twice as loud as it is today. For people living 50' from the road, the noise level will be, by year 2000, approximately 15 dBA higher than the recommended 70 dBA. Numerous complaints can be expected by 1980. A glance at table 2 or 5 will show that heavy trucks are responsible for most of the noise. This strongly suggests that one method of reducing traffic noise level at Pahoa Village is to band heavy trucks on Pahoa Road. This can be done only by providing a by-pass road.

A comparison of table 1 and 2, or 4 and 5 will show the effect of a by-pass road on noise along Pahoa Road. It is easy to see that a by-pass road will reduce the traffic noise level along Pahoa Road by about 3 dB. The reduction, however, can be made as high as 15 dBA by banning all heavy trucks on Pahoa Road.

#### By-Pass Road

Construction of a by-pass road would, of course, raise the noise level along its path. The level would depend on the speed, number of vehicles and the truck-auto ratio.

Table 1 shows the noise level expected 100' from the center line of the nearest lane. Table 4 shows the noise level expected at 50' from the nearest curb. The noise level 50' from the curb will be above the recommended  $L_{10}$  level of 70 dBA by 1980. The noise level at 100' from the by-pass road will not exceed the recommended  $L_{10} = 70$  dBA level until year 2000. This assumes a truck automobile ratio of 11%. If more heavy trucks are routed over the by-pass road the noise level would exceed the recommended  $L_{10} = 70$  dBA sooner. Simultaneously, the noise level on Pahoa Road would decrease.

From the above, we see that the by-pass road should be at least, 100' away from existing residential areas. This reduces the alternatives to A and E.

#### POSSIBLE NOISE CRITICAL AREA

If no by-pass road is built, all of the existing residences abutting Pahoa Road would become exposed to excessive noise by 1990 even after accounting for the 6 to 9 noise reduction expected from quieter vehicles.

#### Pahoa High School

The noise level inside classrooms facing Pahoa Road and Kalapana Road already exceeds the level considered tolerable (Table 7). Further increase in noise level would make teaching and learning difficult. The noise level is expected to reach an intolerable level in the east half of building A, and in building B by 1990, especially if the mauka by-pass (E) is selected because all Kapoho traffic must use Kalapana Road or Pahoa Road. By-pass (A) will greatly reduce the noise impact at the School because the Kapoho-Kalapana and Kapoho-Hilo traffic will not pass the School. It is also expected that most of Kalapana-Hilo traffic will also use by-pass (A). By-pass road (A) also skirts Pahoa High School. (See Figure 2).

## RECOMMENDATION

By 1980, if no by-pass road is provided, the noise level at most residences abutting Pahoa Road, would exceed the recommended  $L_{10} = 70$  dBA level by 7 to 10 dB. By year 2000, the recommended level will be exceeded by as much as 15 dB. This means that the residents would be exposed to noise levels above the acceptable limit for six minutes out of every hour.

A study of table 1 shows that the high noise level is caused by heavy trucks and busses. Truck noise is usually 10 to 20 dB higher, depending on the speed, than automobile and light pickup wagon noise.

An obvious solution to the future noise problem is to band heavy trucks on Pahoa Road. This can be done only by constructing a road which would by-pass Pahoa Village.

The by-pass road, with a concentration of heavy trucks and busses would necessarily generate loud noise. It must, therefore, be removed from any residential area by at least 100 feet. Of the four proposed by-pass roads only Alternate A and E would qualify.

Alternate (E), however, is not recommended because it would increase the noise level in Pahoa High School classrooms to an intolerable level.

Alternate (A) by-pass road is, therefore, recommended. It will change the unacceptable noise condition at the high school to an acceptable condition because almost all of the Kapoho-Kalapana, Kapoho-Hilo, and Kalapana-Hilo traffic would now travel more than 250 feet east of the school. Most of the stop and go noise at the existing Kapoho-Kalapana intersection would also be eliminated. Also, the cane haul truck noise would no longer disrupt classroom activities. It is estimated that the noise level at the school would be 6 dB lower than it is now. The noise level in the classrooms is expected to drop to an acceptable level between 50 and 55 dBA.

### Corrective Actions

No noise reduction measures are required if Alternate (A) is selected as the by-pass road.

If Alternate (E) is selected, classrooms in building (A) and (B) must be soundproofed. (Figure 3).

To keep the noise level in Pahoa Village from rising, it is also recommended that only tour busses, and heavy trucks making deliveries in Pahoa Village be permitted on Pahoa Road.

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APPENDIX A

The following equations were used to calculate all noise levels shown in this report.

Equation 1 - AUTOMOBILE TRAFFIC NOISE

$$L_{50} = 10 \log \left( \frac{V}{S} \right) - 15 \log(D) + 30 \log(S) + 10 \log \left[ \tanh \left( 1.19 \times 10^{-3} \frac{VD}{S} \right) \right] + 29 \text{ dBA}$$

Equation 2 - TRUCK TRAFFIC NOISE

$$L_{50} = 10 \log \left( \frac{V}{S} \right) - 15 \log(D) + 10 \log \left[ \tanh \left( 1.19 \times 10^{-3} \frac{VD}{S} \right) \right] + 95 \text{ dBA}$$

$$\text{Log}_{10} = \text{Log}_{50} + 10 \log \frac{\text{cosh} \left( 1.19 \times 10^{-3} \frac{VD}{S} \right)}{\text{cosh} \left( 1.19 \times 10^{-3} \frac{VD}{S} \right) - 0.951} \text{ dBA}$$

where V = vehicles per hour

S = speed in miles per hour

D = distance from observer to equivalent lane

TRAFFIC NOISE LEVEL @ 100' FROM E NEAREST LANE  
KEAAU-PAHOA ROAD, PAHOA BY-PASS

TABLE 1

PEAK HOUR NOISE LEVEL IN dBA

		1976		1980		1990		2000	
		AM	PM	AM	PM	AM	PM	AM	PM
Kahakai-Keaau Intersection	Auto-L10	54.9	55.1	55.4	55.4	56.9	57.2	57.7	58
	Truck-L10	74	74.2	75	75.8	77.5	78.4	79	79.6
	L10	74	74	75	76	78	78	79	80
Kahakai-Keaau Intersection									
25 MPH	Auto-L10	56.8	57.1	57.4	57.5	58.7	59.4	59.9	60.1
	Truck-L10	71.9	72.9	73.5	74.7	76.4	77.7	78.0	78.9
	L10	72	73	74	75	76	78	78	79
Kahakai-Keaau Intersection									
30 MPH	Auto-L10	58.3	59.1	59.3	59.9	61.1	61.2	62.0	62.1
	Truck-L10	70.6	71.7	71.8	73.4	75	76.4	76.8	77.9
	L10	71	72	72	74	75	76	77	78
Kapoho-Kalapana Intersection									
20 MPH	Auto-L10	54.5	54.9	54	53.7	55	55.6	56	56.5
	Truck-L10	73.6	76	73.4	75.1	76.6	77.5	78.2	78.9
	L10	74	76	73	75	77	78	78	79
Kapoho-Kalapana Intersection									
25 MPH	Auto-L10	56.1	56.8	55.9	55.6	57	57.7	58.3	58.6
	Truck-L10	72.5	73.9	72.2	73.5	75.3	76.6	77.2	77.9
	L10	73	74	72	74	75	77	77	78
Kapoho-Kalapana Intersection									
30 MPH	Auto-L10	58.1	58.3	57.7	57.2	59.0	59.6	60.3	60.8
	Truck-L10	70.8	72.6	70.6	72.1	73.9	75	75.8	76.9
	L10	71	73	71	72	74	75	76	77
Kapoho									
20 MPH	Auto-L10	52.8	53.3	51.7	52.5	53	53.7	54	54.4
	Truck-L10	68.4	69.6	66	67.6	69.6	70.9	71.6	74
	L10	68	70	66	68	70	71	72	74
Kapoho									
25 MPH	Auto-L10	54.4	55.2	53	54.1	55.1	55.7	56.1	56.5
	Truck-L10	67.2	68.3	64.5	66.5	68.4	69.6	70.4	71.9
	L10	69	69	65	67	69	70	70	72
Kapoho									
30 MPH	Auto-L10	56.1	56.9	54.9	55.7	56.9	57.4	57.6	58.4
	Truck-L10	65.7	67	63	64.6	66.9	68.2	68.8	70.6
	L10	66	67	63	65	67	69	69	71
Kalapana									
20 MPH	Auto-L10	51.6	52.2	51	51.2	52.4	53	53.3	54
	Truck-L10	65.5	67.3	64	66	67.8	69.6	70.3	71.6
	L10	66	67	64	66	68	70	70	72

TRAFFIC NOISE LEVEL @ 100' FROM E NEAREST LANE  
 KEAAU-PAHOA ROAD, PAHOA BY-PASS  
 TABLE 1  
 PEAK HOUR NOISE LEVEL IN dBA

		1976		1980		1990		2000	
		AM	PM	AM	PM	AM	PM	AM	PM
Kalapana 25 MPH	Auto-L10	53.8	54	52.6	53	54.2	55.1	55.2	55.8
	Truck-L10	64	65.7	62.5	64.5	66.5	68.3	69	70.4
	L10	64	66	63	65	67	69	69	70
Kalapana 30 MPH	Auto-L10	55	55.7	54	54.7	55.9	56.9	57	57.6
	Truck-L10	62.5	64.2	61	63	65	66.9	67.5	68.8
	L10	63	65	62	64	65	67	68	70
Pahoa Road 20 MPH	Auto-L10	54.9	55.1	54	53	54.9	55.5	55.8	56.4
	Truck-L10	74	74.2	71.8	73	73.3	69.9	76.1	67.5
	L10	74	74.2	71.8	73	73.3	70.1	76.1	67.8
Pahoa Road 25 MPH	Auto-L10	56.8	57.1	55.2	56.1	56.9	57.6	58.1	58.3
	Truck-L10	71.9	71.7	70.1	76.9	73	74.3	74.9	71.7
	L10	71.9	71.7	70.1	76.9	73	74.3	74.9	71.9
Pahoa Road 30 MPH	Auto-L10	58.3	59.1	57.6	58	58.8	60	60.1	61.4
	Truck-L10	70.6	71.7	69.3	79.6	71.9	77	73.8	74.8
	L10	70.8	71.9	69.6	79.6	72.1	77	74	75
By-Pass Alternate A & E 45 MPH	Auto-L10			61.1	62.1	62.4	63.7	64	64.9
	Truck-L10			64.5	66	67.8	69.2	70.1	71.6
	L10			66	67	69	70	71	72

PEAK HOUR TRAFFIC NOISE LEVEL IN dBA @ 100' FROM E NEAREST LANE  
 PAHOA VILLAGE - NO BY-PASS ROAD  
 TABLE (2)

		1976		1980		1990		2000	
		AM	PM	AM	PM	AM	PM	AM	PM
Pahoa Road 20 MPH	Auto-L10	54.9	55.1	55.3	55.6	56.8	57	57.3	59.8
	Truck-L10	74	74.2	74.7	75.6	77.5	78.4	78.9	80.1
	L10	74	74.2	74.7	75.6	77.5	78.4	78.9	80.1
Pahoa Road 25 MPH	Auto-L10	56.8	57.1	57.3	57.9	58.7	58.8	59.1	59.8
	Truck-L10	71.9	71.7	73.6	74.6	76.3	77.2	78	78.9
	L10	71.9	71.7	73.6	74.6	76.3	77.2	78	78.9
Pahoa Road 30 MPH	Auto-L10	58.3	59.1	59.2	59.8	60.7	61.2	61.4	62.1
	Truck-L10	70.6	71.7	72.2	73.4	75	76.3	77	78
	L10	70.8	71.9	72.4	73.6	75	76.4	77	78.1

PAHOA VILLAGE  
AVERAGE NOISE LEVEL IN dBA - 1977  
 TABLE 3

LOCATION	1	2	3	4	5	6	7	8	9	10	11
AM L10	59.5	60	57	40.3	55.5	49	47	53	61	61	61
PM L10	61	61	58	53	60	51	43	51	-	-	-
AM L50	47.2	52.5	48.5	38	50.7	44.6	42.5	43.5	51.5	44.5	53.5
PM L50	49.5	51	46	49	53.5	50	41	42	-	-	-

NOTE: Locations #1,2,3, & 5 Measurement Distance = 100' From Pahoa Road  
 Location #11 Measurement Distance = 86' From Pahoa Road  
 Locations #4,#6 Measurement On Proposed By-Pass A.  
 Locations #7,#8 Measurement On Proposed By-Pass E.  
 Locations #9,#10 Measurement on Kalapana Road.  
 AM = 7-12  
 PM = 1-6

PEAK HOUR TRAFFIC NOISE LEVEL 50' FROM NEAREST CURB.  
 KEAAU - PAHOA BY-PASS  
 TABLE 4

	1976		1977		1980		1990		2000	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Kahakai-Keaau										
L50	64	65	52	54	66	67	69	71	72	74
30 MPH L10	76	77	64	66	77	79	80	81	82	83
Kapoho-Kalapana (Pohoa School)										
L50	64	66	59	60	63	65	67	68	69	71
30 MPH L10	76	77	70	69	75	77	79	80	81	82
Kapoho										
L50	59	60			56	58	60	61	62	64
30 MPH L10	70	72			68	69	72	74	74	76
Kalapana										
L50	56	57	56		54	56	58	60	60	62
30 MPH L10	68	70	66		67	69	70	73	71	74
Pahoa Road										
L50	66.7	67.3			64.4	65.9	67.7	64.3	70.4	63.5
20 MPH L10	78.7	78.9			76.5	77.7	78	74.8	80.8	72.5
Pahoa Road										
L50	64.8	66			62.7	69.4	66.2	67.8	68.8	66.5
25 MPH L10	76.7	77.7			74.8	81.6	77.7	79	79.6	76.6

PEAK HOUR TRAFFIC NOISE LEVEL 50' FROM NEAREST CURB  
 KEAAU - PAHOA BY-PASS  
 Table 4 (cont'd)

	1976		1977		1980		1990		2000	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Pahoa Road										
30 MPH L50	65.7	64.8			62.2	71.8	65.1	70.1	67.5	69
L10	75.5	76.6			74.3	84.3	76.8	81.7	78.7	79.7
By-Pass Road										
45 MPH L50					60	61	63	65	65	67
L10					70	72	74	75	76	77

PEAK HOUR TRAFFIC NOISE LEVEL @ 50' FROM & NEAREST LANE  
 PAHOA ROAD - NO BY-PASS  
 TABLE 5

	1976		1977		1980		1990		2000	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Pahoa Road										
20 MPH L50	66.7	67.3			68.3	69.8	72.7	74.2	75.4	76.7
L10	78.7	78.9			79.4	80.3	82.2	83.1	83.6	84.8
Pahoa Road										
25 MPH L50	64.8	66			66.8	68.3	71	72.4	73.9	75.4
L10	76.6	76.5			78.3	79.3	81	81.9	82.7	83.6
Pahoa Road										
30 MPH L50	63.7	64.8			65	67	69.5	74.2	72.3	74
L10	75.5	76.6			77.1	78.3	79.7	81.1	81.7	82.8
Pahoa Road										
Location #2 Residential	30 MPH	L50	57	56						
		L10	65	66						
Location #3 Residential	30 MPH	L50	53	51						
		L10	62	63						
Location #5 Commercial	25 MPH	L50	56	59						
		L10	60	65						

COMPARISON OF MEASURED & CALCULATED NOISE LEVEL  
 1977 PEAK HOUR @ PAHOA SCHOOL, LOCATION #11  
 AVERAGE SPEED 30 MPH

TABLE 6

Time	Vehicles/Hour		Noise Level in dBA			
			Calculated		Measured	
			Auto	Truck	L50	L10
8-9 AM	210	17	55.0	66.4	54.0	64.6
3-4 PM	346	14	55.5	65.3	54.0	62.5

AVERAGE TRAFFIC NOISE LEVEL INSIDE CLASSROOMS  
 PAHOA HIGH SCHOOL  
 1977  
 TABLE 7

Source	Range in dBA	Location: See Figure 3.
Heavy Truck	(70-75)	Building (A) Noise Measured In Faculty Lounge, Building (A). Average Noise Level = 58 dBA. Noise Level Expected In Other Class- rooms Toward Kalapana Road (55 to 65) dBA.
Pick Up Truck	(54-69)	
Van	(52-59)	
Auto	(50-59)	
Stop & Go	(59-64)	
		Building (B) Noise Level Expected Inside Classroom (60 - 65) dBA.

DESIGN NOISE LEVEL/LAND USE RELATIONSHIPS  
FOR STATE DEPARTMENTS OF TRANSPORTATION, HIGHWAY DESIGNERS, AND PLANNERS

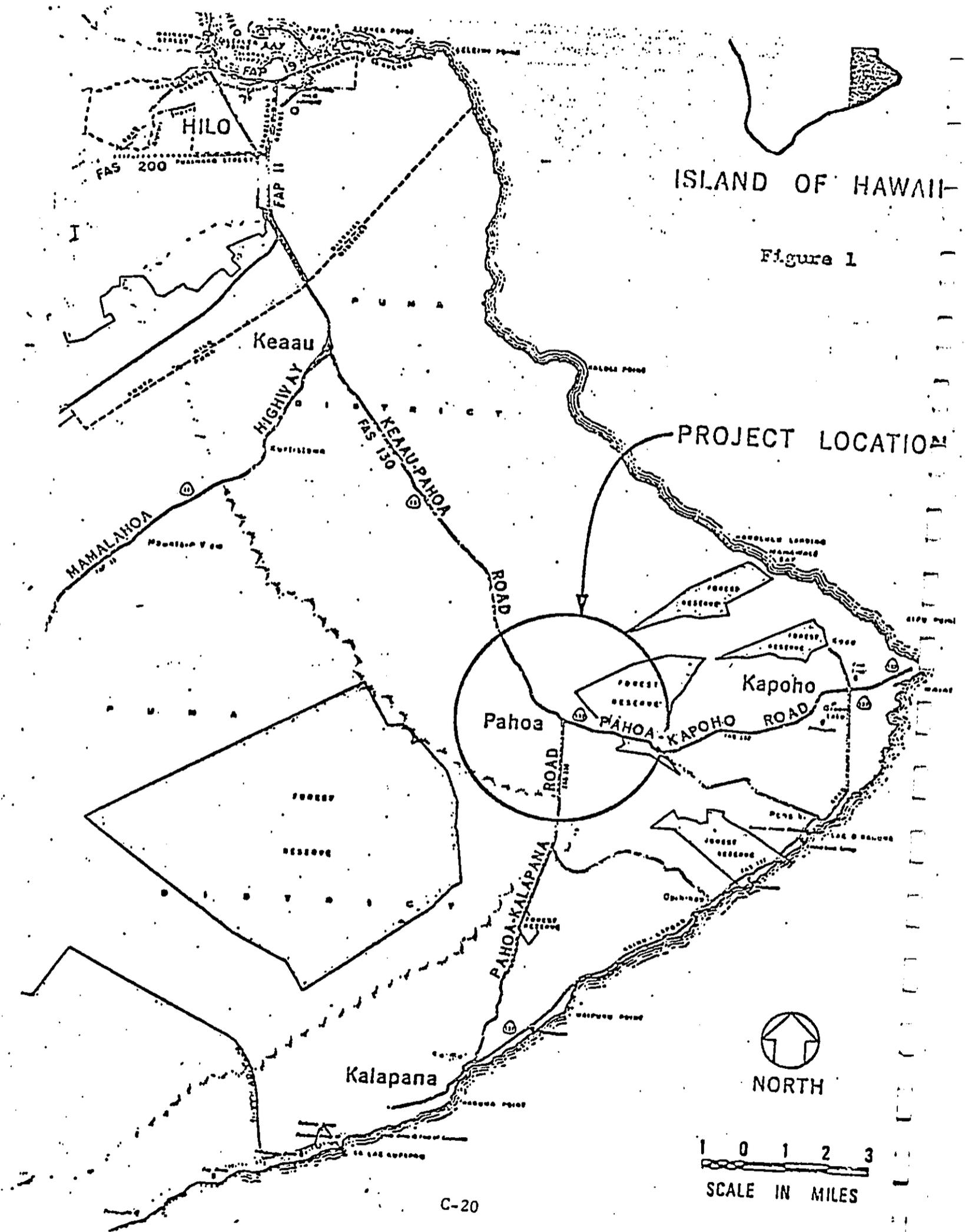
TABLE 8

LAND USE CATEGORY	EXTERIOR DESIGN NOISE LEVEL, L10	DESCRIPTION OF LAND USE CATEGORY
A	60 dBA	Tracts of lands in which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. For example, such areas could include amphitheaters, particular parks or portions of parks, or open spaces which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	70 dBA	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreation areas, playgrounds, active sports areas, and parks.
C	75 dBA	Developed lands, properties or activities not included in categories A and B above.
D	Unlimited	Undeveloped lands
E.	55 dBA (Interior)	Public meeting rooms, schools, churches, libraries, hospitals and other such public buildings.

EXTERNAL NOISE EXPOSURE STANDARDS FOR NEW CONSTRUCTION SITES  
 (measurements and projections of noise exposures are to  
 be made at appropriate heights above site boundaries)

TABLE 9

GENERAL EXTERNAL EXPOSURES	ACCEPTABILITY
Exceeds 80 dBA 60 minutes per 24 hours Exceeds 75 dbA 8 hours per 24 hours CNR Zone 3, NEF Zone C (airport environs) (Exceptions are strongly discouraged and require a 102 (2) C environmental statement and the Secretary's approval)	Unacceptable
Exceeds 65 dBA 8 hours per 24 hours Loud repetitive sounds on site CNR Zone 2, NEF Zone B (airport environs) (Approvals require noise attenuation measures, the Regional Administrator's concurrence and a 102 (2) C environmental statement)	Discretionary- Normally Unacceptable
Does not exceed 65 dBA more than 8 hours per 24 hours	Discretionary- Normally Acceptable
Does not exceed 45 dBA more than 30 minutes per 24 hours CNR Zone 1, NEF Zone A (airport environs)	Acceptable



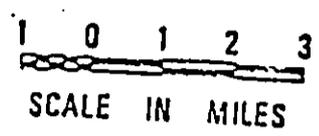
ISLAND OF HAWAII-

Figure 1

PROJECT LOCATION



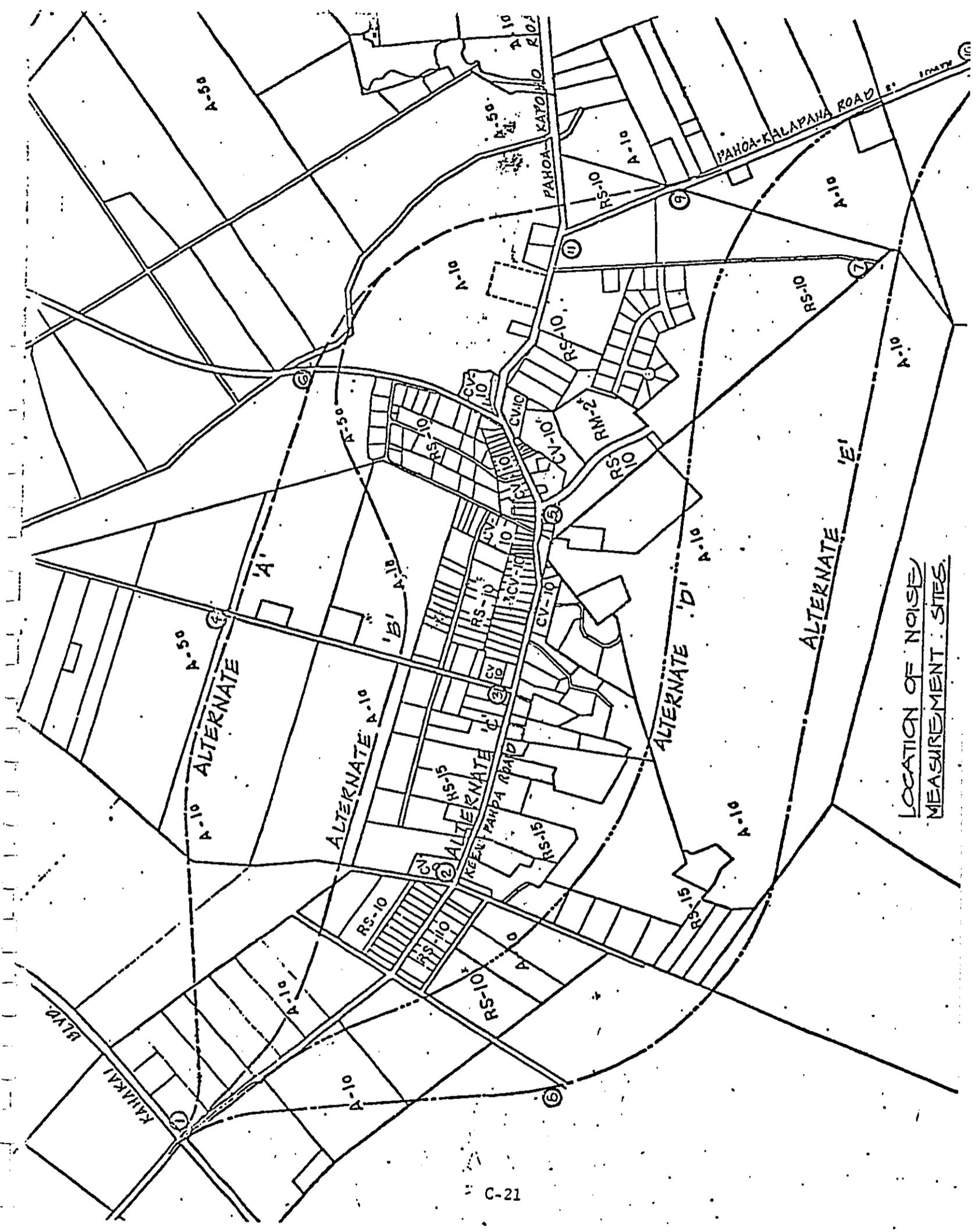
NORTH



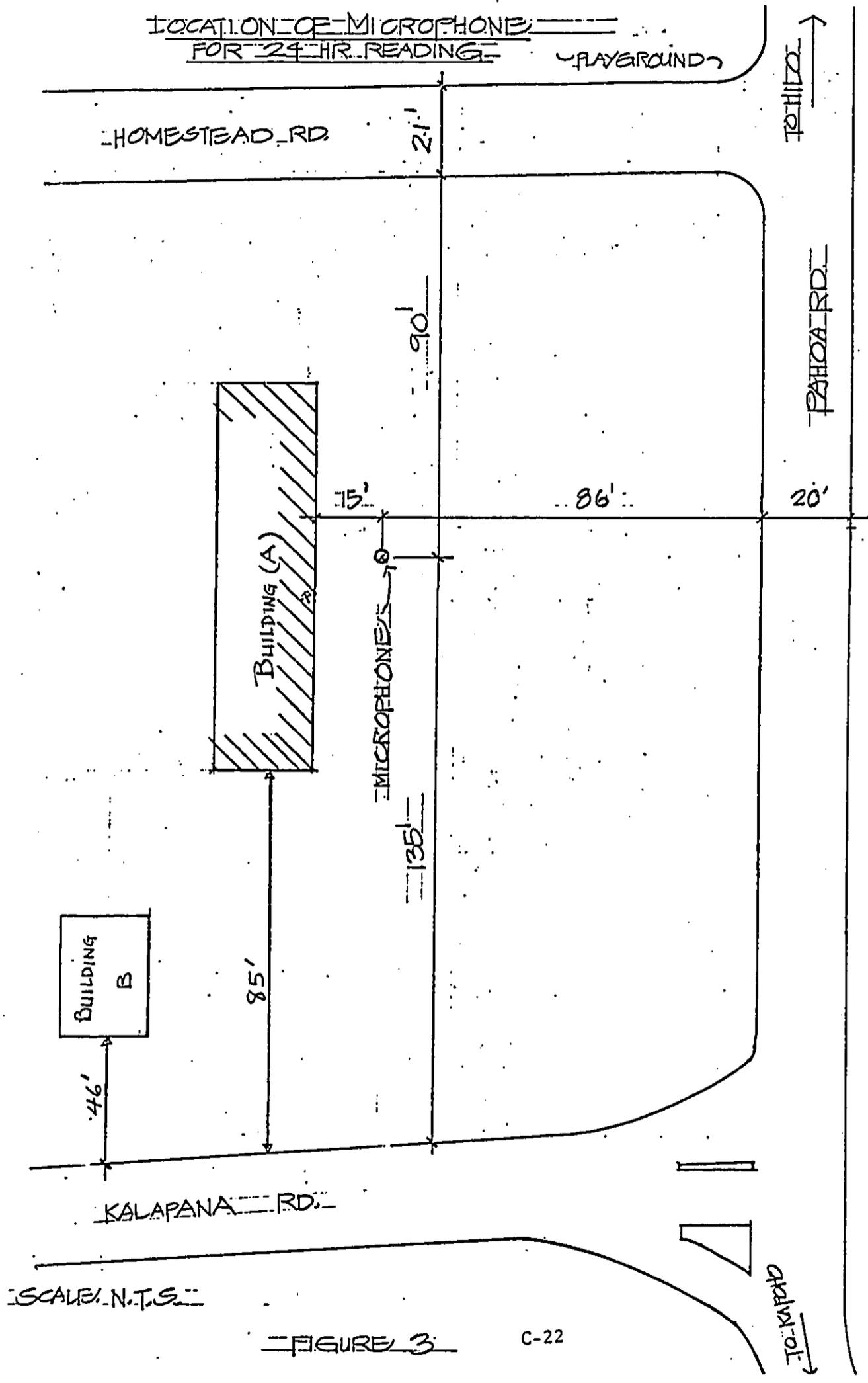
SCALE IN MILES

C-20

PAHOA DIVISION ROAD



LOCATION OF NOISE  
MEASUREMENT SITES



SCALE: N.T.S.

FIGURE 3



HOURLY NOISE LEVEL IN dBA.  
 PAHOA HIGH SCHOOL - SITE (11) - SPEED (25-30) MPH.

MAY 29-30, 1977

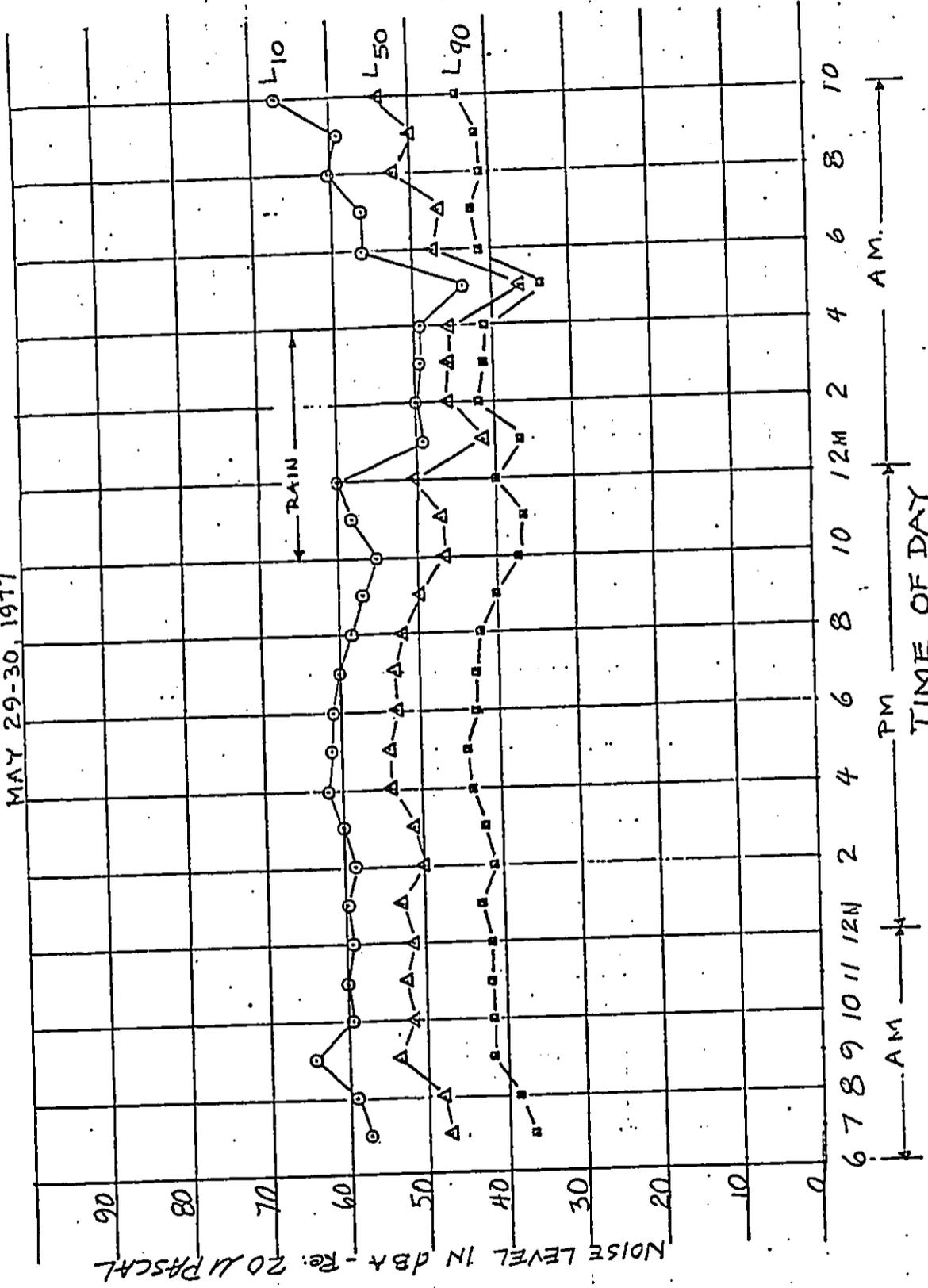


FIGURE (4)

APPENDIX D.

Evaluation Research Conclusions  
Socioeconomic Planning  
Project Evaluation

July 13, 1977

SOCIOECONOMIC IMPACTS OF ALTERNATIVE PALOA HIGHWAY PROPOSALS

This section of the impact study analyzes the various social and economic effects of selected highway alternatives under consideration as part of Project No. HOA-01-76 on the Island of Hawaii. The project is more commonly referred to as the "Paloa By-Pass Road," even though one of the alternatives presently under consideration would simply improve the existing roadway which passes through the center of Paloa town.

The intent of this portion of the overall report is to provide social and economic information that will be complementary to the various engineering, rights-of-way, budgeting, and environmental studies that in a total package should provide a basis for intelligent decisionmaking.

The potential social and economic impacts of a new by-pass route are many. The most pressing negative concern of such projects is usually the loss of sales that might be suffered by business outlets along the previous corridor. The new highway alternatives also threaten to displace existing businesses and residences, with attendant potential losses of employment, income, and damages to community structure. (Some of these losses would be compensated as required by law. The amounts of such compensation are, in effect, part of acquisition

D-1

and construction costs, which are not appropriate to this report. Only impacts will be explored, not the likelihood that compensation would be paid, nor a calculation of its amount.)

The benefits anticipated are also varied. Decreased travel time and expense are generally the foremost benefits for this type of project. Enhanced safety is also a major intended benefit, but the proof of such benefits is almost impossibly difficult to demonstrate with any useful precision. Consequently, this safety benefit will not be further explored in this report. Another possible benefit is the enhancement of property values by improved access. In this instance, existing parcels bounding the corridors under consideration already have easy access. Such land values would be increased only if subdividing and zoning changes are permitted. Value increases would thus not be attributable to the new corridors presently being considered, but would be derived from land use control decisions made by the State and County. Consequently, this potential benefit also will not be further examined in this report.

The subsequent sections of discussion of socioeconomic concerns are as follows: (1) Socioeconomic Setting, (2) The Highway Alternatives, (3) Impact on Travel, (4) Impact on Businesses, (5) Displacement Impacts, (6) Miscellaneous Impacts, (7) Summary.

### Socioeconomic Setting

The primary area affected by the proposed project is the small town of Pahoia and its neighboring subdivisions.

Other more distant regions would be marginally affected, such as the Kaimu and Kupoho areas. These areas are essentially in Census Tract 210, which combined with Census Tract 211 (the Keaau area), forms the Puna District.

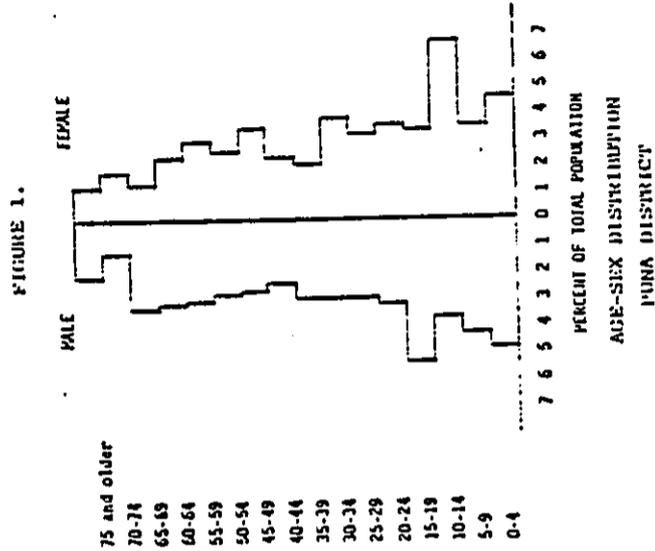
Land use in the area generally involves sugar cultivation on the better lands, with relatively small portions of the more marginal lands being used for tree crops and nursery production. Most of the large acreages of wasteland is essentially unused. Most of the land on the fringes of Pahoia and along the highways leading to the town is zoned A-1a, which has permitted subdivisions of one acre or more and the construction of a home on each parcel, although such residential uses have seldom occurred thus far. The residentially zoned land in the town is primarily designated as RS-10 and RS-15, which permits single-family use on minimum parcel sizes of 10,000 square feet and 15,000 square feet, respectively. The bulk of such parcels is presently being used for residential purposes.

Several residential subdivisions are being developed near Pahoia. Such subdividing, primarily occurring in the late 1950's and early 1960's, has caused land prices in the Puna District to be attractively low. Vacant lots in the district presently exceed 50,000, or nearly 7 per resident. These vacant lots have generally been selling for between \$2,000 and

\$8,000 each. Such low prices have attracted people who might otherwise have lived in Hilo near their jobs and near a wider range of commercial and public services. (Such commuting also leads such people to do a larger share of their shopping in Hilo rather than in Pahoia as compared to people who hold jobs near Pahoia.)

Commercial (not including agricultural) land uses are essentially confined to the parcels bordering the highway in the center of Pahoia. The proximity to the primary transportation corridor is vital to the survival of most of the existing businesses. Approximately 20 businesses exist in Pahoia, including cafes, general stores, service stations, a theater, a fast food outlet, a gift shop, laundromats, a real estate office, a bank, a retail nursery, and miscellaneous other business establishments. Only the gift shop is primarily directed toward tourists; the rest of the firms depend primarily or entirely on residents within the area for patronage.

Commercial activities have declined in Pahoia over the past 3 decades, as evidenced by vacant stores in the community. However, some of the firms have noted significant increases in sales over the past few years, which they attribute to the new residents of the neighboring subdivisions, and in some cases to increases in tourism. Basically, the town can anticipate a continuing slow increase in business volume, assuming that nothing occurs which would divert or restrict these sources of increased patronage.



The population of Puna is approximately 1000. The ethnic backgrounds of the residents are predominantly Japanese, Filipino, and Mixed Hawaiian, although the proportion of Hawaiians (Canadians) has been rapidly increasing as Mainland In-migrants move into the area. As is true in most rural towns of the United States, the population tends to have relatively few people in their twenties and thirties who had been raised in the area since childhood. Most of the long-time residents of the area came to Hawaii from foreign countries to work on the sugar plantations, or they are the children of such immigrants.

Some other population characteristics of people residing in and near Puna can be inferred from those of residents in the Puna District. Approximately 60 percent of the adults have completed high school. The median household income is about \$10,000 annually. The unemployment rate is about 7 percent. About 25 percent of those working hold jobs in agriculture, 17 percent are employed in construction, 19 percent are in retail jobs, 16 percent are in service employment, and the remainder are in various other classifications such as manufacturing, etc. The age-sex distribution for the Puna District is shown in Figure 1. Annual incomes are under \$10,000 for 35 percent of the households, and only 2 percent have incomes above \$15,000. The population is anticipated to increase by 50 percent between 1976 and 1990.

Within the Puna District, the major employer is the sugar industry with about 400 jobs, although the papaya industry

has come to rival this place of importance by employing about 270 people full-time and 230 part-time. About one-third of the workers residing in Puna commute to Hilo. Since there is little reason to anticipate significant increases in employment in the Pahoia area, the anticipated population increases in the neighboring subdivisions will require an increase in this level of commuting to Hilo for employment.

Pahoia is essentially a social and economic remnant of an earlier plantation era that required workers to be near their jobs, but to live in concentrated urban pockets that provided effective social control, economies of land use, and efficient means of providing community services. If the town did not exist at its present location, there would be little justification for constructing it there, for no major source of jobs in sugar or papaya processing and cultivation nor in tourism exist at that location. Furthermore, the topographic and climatic features are not peculiarly conducive to residential development.

Nevertheless, such communities are continuing vital parts of society because of the strong sense of community identity that exists in such small towns. Most of its residents undoubtedly give little thought to moving elsewhere. The older residents deeply value the community as a source of social "security" and some of the newer residents have fled from more impersonal metropolitan settings in order to benefit from the social amenities of small-town living. Furthermore, the existing

buildings and other improvements are, from an economic point of view, sunk capital. This means that such past investments continue to provide benefits to society at little further cost. Such investments include not only public facilities such as the school, library, post office, roadways, etc., but also the houses and business structures that cannot readily be moved elsewhere.

Residents of nearby subdivisions are not as deeply involved in the Pahoia community structure as are the town residents themselves. Although their children may attend Pahoia High and Elementary schools, and they may purchase some items in the town for the sake of convenience, their perception of their community is more diverse than that of the town residents. Consequently, the existence of Pahoia is not of central importance to their lives.

#### The Highway Alternatives

The proposals under consideration are described in detail elsewhere in the overall report, so only the travel implications need be described at this point as a means of establishing a setting for the discussion that follows. Four alternatives are presently proposed. The most obvious is the "do-nothing" possibility. Alternate A and its variation, A<sub>1</sub>, would provide a route that would bypass Pahoia on the makai side. Alternate E and variation, E<sub>1</sub>, would provide a bypass on the opposite side of the town. Alternate C would improve the existing route through the center of Pahoia.



existing routes instead of the 'E' bypass since the 'E' route would require additional travel between points T and K.

Alternate "C" would be an improvement of the existing roadway which would thus not change the present routing between the points described. The alternative of doing nothing would obviously also not change travel patterns.

The implications of this description of travel routing should emerge in the subsequent sections.

#### Impact on Travel

Users of these alternate routes will be influenced in their travel decisions by the time and distances involved. If they are able to lower their time, which has a dollar value to them, and their automotive operating costs, they are likely to travel more frequently. Such time and financial savings will also permit them to engage in more non-travel activities and to spend money for other things. Such savings may also attract other travellers who might not have otherwise travelled along the route. Decisions such as these have repercussive effects on land values and business rates that may be location-ally far removed from the actual highway improvements.

Although these observations are conceptually valid, it is most difficult to quantify the impacts involved. At best, it is possible to estimate the time and operational cost savings that may be attributed to the variations of the project under consideration.

By referring to "destination" points H, T, K, and P, it is possible to illustrate some of the cost savings involved. Trips to Point P, the business section of Paloa, would not be affected by alternates A and E, which do not pass through that point. (Subalternates A<sub>1</sub> and E<sub>1</sub> are essentially the same as A and E, respectively, for purposes of analysis in this section of the report.) Alternate C would increase travel time to that point, but distance would essentially remain constant, so vehicle operation costs would presumably be unaffected by Alternate C compared to the present situation. Based on data secured by the state's Department of Transportation, it is reasonable to assume that by 1980 about 3000 vehicles would pass daily, on the average, along a center point of either Alternate C or the "do-nothing" alternate (excluding trips between points H and T and between H and K). If we assume that all such vehicles would travel a distance along these routes equal to an average of 1.5 miles, and that the speed would be increased from 20 to 25 miles per hour for that distance, the annual gross time saved for all trips would be equal to 16,425 hours. If these hours are valued at \$3.00 per vehicle-hour, there would be an annual value of \$49,275, which equates about \$526,000 if capitalized at a rate of 8 percent for 25 years. In reality, this level of traffic would likely be increasing through time, so this estimate of present value of the time saved would be a minimal estimate of the benefits of Alternate C over the present highway.

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Savings of time and distance between were complex to estimate when considering various other destination points and the alternate routes involved. Table 1 indicates the distances and times involved for various combinations of alternate routes and destination points.

If a person were driving between points H and G, the distances for the various alternatives are essentially the same, so it is assumed that differences in vehicle operation costs would essentially be negligible. However, travel times vary from 2.6 minutes to 6.5 minutes, which is a significant difference. (Some alternate routes involve the possibility of going from Point H to Point K by way of Point T. Such trips are referred to as H-K trips in Table 1 and are not a part of the discussion concerning H-T trips.) The number of vehicles making this trip is assumed to average 1700 daily by 1980, as inferred from the estimates prepared by the Department of Transportation. The alternate routes in comparison with the present route show the following benefits from lessened travel time (based on a value of \$3.00 per hour, an 8 percent rate of interest, a time period of 25 years, and a constant traffic count through time): Route C provides a capitalized value of \$429,000; Route A is worth \$1,272,000; and Route E is worth \$1,299,000.

Trips between points H and K involve not only differences in time saving, but also differences in travel distance. By assuming a cost at the margin of 4¢ per mile for the average vehicle, this factor can be added to the value of time saved.

TABLE 1. TRIP DATA FOR ALTERNATE ROUTES

Trip Points	Alternate	Speed(MPH)	Distance(Miles)	Time(Minutes)
H-T	C	25	2.16	5.18
H-T	A	50	2.20	2.64
H-T	H	50	2.13	2.56
H-T	Present	20	2.16	6.48
H-H	C	25	1.53	3.67
H-H	A	50	1.57	1.88
H-H	H	50/30	2.76	3.82
H-K	Present	20	1.53	4.59

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However, in this instance there are no available indications of estimated traffic prepared by the Department of Transportation that can be applied to this phenomenon. For example, Alternate E is not nearly as desirable as Alternate A for people travelling from Kapoho to Hilo. Consequently, it cannot be assumed that the estimated traffic count for Alternates A and E will be the same. For purposes of illustration, the following figures representing rough estimates of average daily traffic in 1900 will be used to analyze comparative benefits for the travellers from Point H to Point K: 1000 for Alternate C and for the "do-nothing" alternative; 900 for Alternate A; 200 for Alternate E.

In comparison with the present route, Alternate C would offer no gain in vehicle operation costs for trips from Point H to Point K, but the capitalized value of time saved would be about \$180,000. (The assumptions of value and constant traffic count are the same as made in preceding estimates.) Alternate A offers a benefit of \$174,000. Alternate E is least attractive for trips of this type, offering a time saving worth \$30,000, which must be adjusted to allow for the added operational expense of driving an additional 1.2 miles. Given the cost and vehicle-count assumptions, the capitalized value of such increased costs amount to \$38,000, leaving a net benefit of a negative \$8,000.

Table 2 summarizes the previous calculations. Although it is reasonable to conclude that Alternate A is clearly to be

TABLE 2. CAPITALIZED VALUES OF COMPARING SAVINGS RESULTING FROM THE PROPOSED ALTERNATES

Trips	Alternate C	Alternate A	Alternate E
Trips to Point P	\$ 526,000	\$ -----	\$ -----
Point H to Point J	429,000	1,272,000	1,299,000
Point H to Point K	180,000	474,000	-8,000
Gross Savings	\$1,135,000	\$1,746,000	\$1,291,000

period of 25 years.) This type of market behavior is a major underlying reason for the approximate \$16,000 difference in selling price between single-family residences in Hilo versus those in Puna.

The time savings brought about by the project will encourage settlement in the region south and east of Pahoehoe. There is no means of reliably quantifying this effect on population distribution.

Economic theory suggests that time savings would also affect the decisions of area residents to shop in Hilo rather than Pahoehoe. However, the time savings involved per trip are so small that such induced changes are considered to be negligible in this instance. The theory also suggests that the area will be more appealing for the location of various industries and that existing firms will increase production in response to lowered costs. However, given the lack of proximity to markets and sources of supply, such impacts in this instance are considered negligible. Costs to tour companies providing tours to the Kaimu area will decline slightly, but in such an insignificant fashion that prices and incomes derived from tourism will be negligibly affected. (The impact of tourism on Pahoehoe's economy will, however, be affected. This will be treated in the subsequent section.)

Impact on Businesses

This section addresses the impacts on commercial sales of the bypass routes. It does not address dislocation

preferred over the other two alternatives in terms of travel cost savings, these figures cannot be used for purposes beyond such comparisons. For example, these benefits cannot be directly compared with construction or other costs, for if anything they are very conservative estimates by virtue of the assumption that traffic would not increase. More precise estimates of such benefits would require better estimates of future traffic flows than have been available at the time this study was being prepared. Furthermore, given the available data, the conversion of time savings to dollars (\$1.00 per hour per vehicle) is necessarily a somewhat arbitrary procedure that would require considerable improvements before valid comparisons could be made with market-determined costs.

These savings in travel costs are transformed by the market into enhanced property values reflecting the increased residential desirability of the affected area. For example, people faced with commuting to the Hilo area for employment would be willing to pay more for residential land and existing housing than would otherwise be the case. (If the time spent in commuting were lowered by only 2 minutes per day, the present (capitalized) value of such savings could be estimated to be about \$327 per commuter, which would enhance the value of the commuter's residence by approximately that amount.

This assumes 250 working days annually, a dollar value of \$4.00 per hour, an interest rate of 9 percent, and a time

a rate of 9 percent and a time period of 25 years). The bypass alternatives are likely to cause a loss of the bulk of these sales, jobs, and incomes in the Pahoa area, since tourists will be unlikely to divert through Pahoa when they have the bypass option. Alternative C would not have this negative impact, nor obviously would the "do-nothing" alternative.

(Since it is likely that the Chain of Craters Road will be re-opened by the time the Pahoa project is completed, the nature of tourist traffic flows will be altered from the existing patterns. The closing of the road by the lava flow apparently had the effect of cutting in half the number of tourists who visited the Katapana area. However, such a visit after the closing of the Chain of Craters Road required that tourists pass through Pahoa going to and coming from Katapana. Consequently, the closing of the road apparently had little effect on tourist expenditures in Pahoa. It is believed that the re-opening of the Chain of Craters Road will similarly have little effect on Pahoa's commerce.)

Displacement Impacts

Each of the alternatives under consideration would result in the displacement of some household and economic activities. Such displacement will be compensated and relocation assistance will be paid in accord with law, but the nature of the various displacement impacts is nevertheless relevant to the decisions involving the selection of one of the highway alternatives.

effects, which are analyzed in the subsequent section.

The major impact on commercial sales will derive from the loss of sales in Pahoa to tourists. (A cursory study of Pahoa's traffic indicates that rented cars pass through Pahoa about 240 times daily.) Since the residents of the area will continue to be aware of the business activities in Pahoa, there should be only a negligible decline in sales to that segment of the buying public. In fact, as the nearby subdivisions continue to fill, sales to local residents are likely to increase. Some negative impact may occur as "impulse" purchases decline, since there may be fewer occasions for such transactions. Such effects will be negligible. The bypass alternatives obviously would have the effect of reducing traffic congestion in the commercial segment of Pahoa. Consequently, it would to some extent be a more appealing shopping place for area residents. The impact of this effect is also considered to be negligible.

The present retail sales in Pahoa to tourists were estimated by a direct survey of existing businesses that had sales of significance to non-residents of the area. In order to maintain confidentiality, only the aggregated figures will be reported. Total annual sales to tourists are at present about \$280,000. This level of sales provides 2.6 full-time jobs and 2.6 part-time jobs. The household income derived directly from this level of sales amounts to about \$33,000 annually, which converts to a present value of \$124,000 (using

12 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Household displacement can be very upsetting to the individuals involved, but past experience shows that (1) such displacement seldom leads to a change in employment; (2) the new place of residence is frequently of better quality than the one displaced, since the household often combines part of its personal funds with the compensation paid by government in order to acquire another residence; (3) the displacement may often trigger a major change in location or tenure (owning versus renting) that had been considered but not yet acted upon; (4) shopping and community participation patterns seldom change as the result of relocation. Table 3 shows the range of household displacement impacts, ranging from none for E<sub>1</sub> to 18 for Alternate C which would upgrade the existing route.

Only Alternate C would displace existing non-agricultural enterprises, as shown in Table 3. The total sales of these 6 firms amount to \$766,000. They provide approximately 6 full-time and 14 part-time jobs, and about \$100,000 in annual household income. There is insufficient indication from past studies of commercial displacement to determine the likelihood of how and where such businesses might be re-established.

Displacement of agricultural activities would occur for Alternates A, A<sub>1</sub>, E, and E<sub>1</sub>, as is also shown in Table 3. Unlike the commercial activities discussed in the previous paragraph, it is necessary to estimate the "multiplier" effects created by this loss of agricultural production. In the case

Three of these would likely be re-facced rather than moved. Alternate C would also displace a church building. Also Alternates A and C would have a temporary impact on a small macadamia nut storage facility. Also not included is a property rental firm presently leasing to some of the impacted businesses.

EXCLUDES AGRICULTURAL DISPLACEMENT

Alternate	Households	Businesses	Annual Agricultural Production in \$
A	3	1	\$10,700
A <sub>1</sub>	2	1	15,000
E	1	1	3,600
E <sub>1</sub>	0	1	3,600
C	18	7*	-

TABLE 3. DISPLACEMENT EFFECTS

of non-agricultural businesses, existing economic demand will simply be diverted to new businesses in the county or to increases in the sales of existing firms. Consequently, the impact is of uncertain duration and intensity within the Paloa area, but the slack would likely be taken up elsewhere in the County. Similarly, the "multiplier" effect was not appropriate to include in the analysis of the possible loss of business sales to Paloa merchants, for it can be assumed that these sales would be diverted elsewhere in the County or State. However, agricultural production of the type threatened by displacement would ultimately be for out-of-state purchasers who would simply divert their purchases to products from elsewhere than Hawaii. This means that repercussive or "multiplier" effects would be felt in Hawaii's economy beyond the direct effects experienced in the Paloa area, and that such losses are essentially permanent.

The impacts of losses to agriculture are shown in Table 4. Perhaps the number of jobs and the amounts of income lost on a statewide basis are the most crucial items to consider. Alternates E or E<sub>1</sub> are clearly the least damaging to the agricultural sector of the bypass routes under consideration, with only a loss of \$3,110 in annual income. Even the maximum damage of \$12,750 in annual income from this type of impact is not of great significance in the context of the project's benefits and other costs.

TABLE 4. ECONOMIC EFFECTS OF AGRICULTURAL DISPLACEMENT

Effects	Alternate A		Alternate B or E <sub>1</sub>	
Agricultural Jobs	.15	.24	.05	
Agricultural and Agricultural-Related Jobs	.40	.56	.13	
Statewide Jobs	.54	.77	.18	
Average in Production	8.60	12.40	2.90	
Agricultural Income (Annual)	\$ 2,760	\$ 4,200	\$ 900	
Agricultural and Agricultural-Related Income (Annual)	\$ 6,640	\$ 9,170	\$ 2,240	
Statewide Income (Annual)	\$ 9,230	\$12,750	\$ 3,110	
Statewide Sales (Annual)	\$34,370	\$46,700	\$11,560	

Highway construction in some instances threatens to disrupt a community's structure by cutting off a portion from convenient access and interchange with the balance of the community. No such impact is anticipated in this case.

Several assumptions made in the calculation of agricultural impact may be of importance to those attempting to assess such analysis. Route A1 passes through an anthurium shed presently under construction. The negative impact on production of the displacement of this facility is assumed to be short-term, and is thus not included in the above assessments of impact. Also, a cane haul road would be intersected by some of the alternate routes. The portion of the road displaced was treated as sugar-producing acreage on the assumption that sugar acreage would have to be converted to a roadway in order to replace the lost segment of the cane haul road.)

Miscellaneous Impacts

A number of other impacts are conceivable. Access to public facilities such as parks, churches, and schools is sometimes enhanced by highway construction. The only instance of this clearly occurring is for travel to and from the beach parks near Kalapana. Account of such impacts is taken in the section on impact on travel. (Also, Alternate C might possibly infringe on the operation of Palma High and Elementary School.)

The site of the potential geothermal power plant would also be served by the proposed project. The tremendous uncertainties concerning the future scope and nature of this facility prevent any assessment of the beneficial impacts of the highway project on it. Alternate C would impact existing telephone and electric power lines. The extent of such impact is not known at this time.





COUNTY OF  
HAWAII

## PLANNING DEPARTMENT

25 AUPUNI STREET • HILO, HAWAII 98720

APPENDIX E

HERBERT T. MATAYOSHI  
Mayor

SIDNEY M. FUKU  
Director

DUANE KANUHA  
Deputy Director

December 9, 1977

Mr. Fred Rodriguez, President  
Environmental Communications, Inc.  
P. O. Box 536  
Honolulu, HI 96809

Dear Mr. Rodriguez:

### Pahoa By-Pass

This is to confirm your conversation with my Deputy on December 6, 1977 regarding the above and whether the ultimate alignment selection would require a General Plan amendment.

Although the General Plan does not address the proposed by-pass per se, an amendment to the document or the facility map will not be required, provided that the proposal is complementary to the goals, policies, and applicable standards of the General Plan Transportation element.

Inasmuch as the General Plan is a rather comprehensive document, coordination and integration with all other elements should be pursued where applicable.

If we can be of any further assistance in this regard, please feel free to contact us.

Sincerely,  
  
SIDNEY FUKU  
Director

DK:muk

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



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

October 12, 1976

APPENDIX F

CHRISTOPHER CODO, CHAIRMAN  
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU  
DEPUTY TO THE CHAIRMAN

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

Mr. T. Hirano  
Chief, Highways Division  
Department of Transportation

Dear Mr. Hirano:

Subject: Keaau-Pahoa Road, Pahoa Bypass Road  
Project No. 130AB-01-76, Hawaii Island

Within the project area is located the Pahoa Historic and Commercial District, Hawaii Island Site Number 7388. This district, which is outlined in blue, may be eligible for inclusion to the National Register of Historic Places pending a thorough historical and architectural study. The area marked "x" and bounded by green indicated locations where sugar cane cultivation or other land alterations do not appear to have occurred. Before any determination of whether archaeological sites may be eligible to the National Register or not, a reconnaissance survey of these areas should be conducted by a professional archaeologist to verify the presence or absence of archaeological resources.

Sincerely yours,

A handwritten signature in cursive script that reads "Jane L. Silverman".

Jane L. Silverman  
Historic Preservation Officer  
State of Hawaii

Enclosures

ARCHAEOLOGICAL COVER SHEET

HAWAII REGISTER OF HISTORIC PLACES

Sacred Heart of Jesus

50 - 1 0 - 5 5 - 7 3 8 8  
1 2 3 4 5 6 7 8 9

SITE IDENTIFICATION NUMBER

2 1 1 8 9 8  
10 11 12 13 14 15 16 17 18 19 20

CARD No. DATE/PERIOD

PRESENT LAND USES: Religious

SITE NAME/TYPE: Fahoa Catholic Church

DISTRICT: Funa

AREA: \_\_\_\_\_ square

CATEGORY:  Single Feature  Complex  Places

OWNERSHIP:  Public  Private

PHOTOGRAPHS:  Yes  No (Temp/Tech)

KNOWN PRESSURES ON SITE: None known

DESTRUCTION:  No Known Future Danger  Possible Future Danger  Future Danger Certain  
 Present Danger  Presently Being Destroyed

STATUS:  Occupied  Unoccupied CONDITION:  Excellent  Good  Fair  Deteriorate

INTEGRITY:  Unaltered, Orig Loc  Unaltered, Moved  Altered, Orig Loc  Altered, Moved

ACCESSIBILITY:  Unrestricted  Restricted  Inaccessible

LEGENDARY MATERIALS KNOWN:  Yes  No WRITTEN HISTORICAL MATERIALS:  Yes  No

IMPORTANCE AS EXAMPLE OF TYPE SITE:  Good  Moderate  Poor

SUSCEPTABILITY TO INTERPRETATION:  Good  Moderate  Poor

RESEARCH POTENTIAL:  Good  Moderate  Poor

LOCAL ATTITUDES ABOUT SITE:  Valuable  Moderate Value  Low Value  Ambivalent  Unknown

BRIEF DESCRIPTION (Columns 21-80): Wooden drou sidink church with front tower and steeple. Pointed arched doorways and windows. Guthouse. Rectory with curved bays. Graves

STAFF EVALUATION:  High Value  Valuable  Reserve  Marginal

SUGGESTED THEMES: 04; 18; 36; Architecture; Religion; Habitation

DATE SUBMITTED TO REVIEW BOARD: \_\_\_\_\_

REVIEWER'S RECORD AND EVALUATION

NAME: \_\_\_\_\_ DATE REVIEWED: \_\_\_\_\_

CATEGORY:  High Value  Valuable  Reserve  Marginal

SIGNIFICANCE:  National  State  Local

RECOMMENDED DISPOSITION:  Nominate National Register  State Register  Staff Files

RECOMMENDED THEMES: \_\_\_\_\_

REVIEWER'S COMMENTS: \_\_\_\_\_

REVIEW BOARD EVALUATION RECORD

DATE REVIEWED: \_\_\_\_\_ RECORDER: \_\_\_\_\_

OFFICIAL CATEGORY:  High Value  Valuable  Reserve  Marginal

OFFICIAL SIGNIFICANCE:  National  State  Local

OFFICIAL THEMES: \_\_\_\_\_

OFFICIAL DISPOSITION:  National Register Nomination  State Register  Staff Files

REVIEW BOARD COMMENTS: \_\_\_\_\_

VOTING RECORD: Daws \_\_\_\_\_ Hormann \_\_\_\_\_ Jackson \_\_\_\_\_ Kikuchi \_\_\_\_\_  
Lind \_\_\_\_\_ Mark \_\_\_\_\_ Nagata \_\_\_\_\_ Paglinawan \_\_\_\_\_  
Roche \_\_\_\_\_ Tuggle \_\_\_\_\_

MAR 17 1977

rec'd file  
3/15/77

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



10 / 55 / 7388

Island Quad Site No.

HAWAII REGISTER OF HISTORIC PLACES  
SHORT FORM

SITE NAME/TYPE Sacred Heart of Jesus Pahoa Catholic Church

LOCATION Pahoa, Puna, Hawaii

OWNER \_\_\_\_\_

MERIT:  Architectural  Historical

INFORMATION: Written  No  Yes: Marzen, F., The Catholic Directory, Hon., HI, 1973

Informant  No  Yes: \_\_\_\_\_

GENERAL DESCRIPTION AND STATEMENT OF SIGNIFICANCE:

The Pahoa Catholic church is a rectangular structure with drop siding and a high pitched gable roof. A tower with a steeple is located on the front entrance side and lancet windows with intersecting tracery heads give the wooden structure a local Gothic appearance. The entrance doors consist of double pointed arched doorways with a fanlight above. A rosette window appears over the entrance and two lancet windows flank it.

The interior of the church is paneled up to about three and a half feet. Wood molded brackets accent the ceiling rafter ends and the altar area is marked by a pointed arch. A small balcony is cantilevered over the back of the church and supported by two turned posts.

Other buildings on the lot include an outhouse and the rectory. A small graveyard is located in the rear.

The church structure was built in 1898 by Father Bonaventure. Pahoa was considered the center for Catholic life in the Puna area at that time, and today it still functions as a Catholic focal point. Father Evarist Gielen served this parish and is remembered for his painted churches.

REASON FOR USE OF SHORT FORM: Lack of detailed historical information

SURVEYED BY John C. Wright RECOMMENDATION Reserve

DATE OF SURVEY December, 1973 F-3 AX KEY \_\_\_\_\_

LOCATION MAP IS DRAWN ON OPPOSITE SIDE OF SHORT FORM

ARCHAEOLOGICAL COVER SHEET

HAWAII REGISTER OF HISTORIC PLACES

50 - 10 - 55 - 7388  
 1 2 3 4 5 6 7 8 9  
 SITE IDENTIFICATION NUMBER

2 1 c 19 25  
 10 11 12 13 14 15 16 17 18 19 20  
 CARD No. DATE/PERIOD

PRESENT LAND USES: Residential  
 DESTRUCTION:  No Known Future Danger  Possible Future Danger  Future Danger Certain  
 Present Danger  Presently Being Destroyed  
 STATUS:  Occupied  Unoccupied CONDITION:  Excellent  Good  Fair  Deteriorated  
 INTEGRITY:  Unaltered, Orig Loc  Unaltered, Moved  Altered, Orig Loc  Altered, Moved  
 ACCESSIBILITY:  Unrestricted  Restricted  Inaccessible

LEGENDARY MATERIALS KNOWN:  Yes  No WRITTEN HISTORICAL MATERIALS:  Yes  No  
 IMPORTANCE AS EXAMPLE OF TYPE SITE:  Good  Moderate  Poor  
 SUSCEPTABILITY TO INTERPRETATION:  Good  Moderate  Poor  
 RESEARCH POTENTIAL:  Good  Moderate  Poor  
 LOCAL ATTITUDES ABOUT SITE:  Valuable  Moderate Value  Low Value  Ambivalent  Unknown  
 BRIEF DESCRIPTION (Columns 21-80): Small tiled house with refinements: Glass  
double entrance doors; Front porch with diamond patterned balustrade;  
Camphored posts

STAFF EVALUATION:  High Value  Valuable  Reserve  Marginal  
 SUGGESTED THEMES: 04; 36 Architecture; Habitation

DATE SUBMITTED TO REVIEW BOARD: \_\_\_\_\_

REVIEWER'S RECORD AND EVALUATION

NAME: \_\_\_\_\_ DATE REVIEWED \_\_\_\_\_  
 CATEGORY:  High Value  Valuable  Reserve  Marginal  
 SIGNIFICANCE:  National  State  Local  
 RECOMMENDED DISPOSITION:  Nominate National Register  State Register  Staff Files  
 RECOMMENDED THEMES: \_\_\_\_\_

REVIEWER'S COMMENTS: \_\_\_\_\_

REVIEW BOARD EVALUATION RECORD

DATE REVIEWED: \_\_\_\_\_ RECORDER: \_\_\_\_\_  
 OFFICIAL CATEGORY:  High Value  Valuable  Reserve  Marginal  
 OFFICIAL SIGNIFICANCE:  National  State  Local  
 OFFICIAL THEMES: \_\_\_\_\_

OFFICIAL DISPOSITION:  National Register Nomination  State Register  Staff Files  
 REVIEW BOARD COMMENTS: \_\_\_\_\_

VOTING RECORD: Daws \_\_\_\_\_ Hormann \_\_\_\_\_ Jackson \_\_\_\_\_ Kikuchi \_\_\_\_\_  
 Lind \_\_\_\_\_ Mark \_\_\_\_\_ Nagata \_\_\_\_\_ Paglinawan \_\_\_\_\_  
 Roche \_\_\_\_\_ Tuggle \_\_\_\_\_

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



10 / 05 / 1900  
Island Quad Site No.  
HAWAII REGISTER OF HISTORIC PLACES  
SHORT FORM

SITE NAME/TYPE Tao House

LOCATION Pahoa, Puna, Hawaii

OWNER Funa Sugar Company leased to Haruo Tao  
Pahoa, Hawaii

MERIT:  Architectural  Historical

INFORMATION: Written  No  Yes: \_\_\_\_\_

Informant  No  Yes: \_\_\_\_\_

GENERAL DESCRIPTION AND STATEMENT OF SIGNIFICANCE:

This small wooden one-story house was surveyed as an architectural type. Its well-maintained yard and general appearance is in sharp contrast to the mill camp directly across the street. The house has a small entrance porch which is accessible from a side staircase. Diamond patterned balusters enclose the porch which has a pair of half glass entrance doors. The gable roof extends out on both sides with shed extensions.

A decorative touch is noted in the caulked posts and the window heads. Windows are double hung with vertical panes, four each. Primary interest in this house is for its architectural style. No historical research was conducted.

The land is owned by the Funa Sugar Company and is leased to the present house owner, Haruo Tao.

REASON FOR USE OF SHORT FORM: Lack of historical information

SURVEYED BY John C. Wright RECOMMENDATION Reserve

DATE OF SURVEY December, 1973 F-5 TAX KEY 1-5-114-24

LOCATION MAP IS DRAWN ON OPPOSITE SIDE OF SHORT FORM

HAWAII REGISTER OF HISTORIC PLACES

HISTORICAL SITES INFORMATION AND REVIEW FORM---CONTINUATION SHEET

Please note subject heading (Statement of Significance, etc.; use separate sheet for each heading).

Statement of significance-Fahoa District

Until the Hawaiian Mahogany Lumber Company ceased operations in 1918 the company (the company's name was later changed to Fahoa Lumber Company) obtained their lumber from the forest of the Funa district. Trees were felled on homestead lots above Olaa and on Funa Sugar company land. The process served a dual purpose which not only provided lumber but also helped to clear the land so that the plantation could plant cane. Some of the land cleared was also used to plant rubber trees.

Prior to the company's opening in 1907, eighteen carpenters were sent to the site to build quarters for the loggers. It was stated that many of the loggers were from Kauai.

The Fahoa Lumber Company changed its name for the third time shortly before it went out of business. The company was known as Hawaii Hardwood Company Limited.

The company provided employment for hundreds of individuals who came to the area to work. When the company ceased operations, many workers stayed in the area and started to work for the sugar plantation that was increasing in size.

Today the town is still an active center. New businesses have located their offices in the town, and although many of the commercial buildings have been converted to residences, those in operation are usually busy. The town has its own church and school as well as mill camp and commercial areas. It is a good example of an old town

F-6  
that continues to have its old charm. A reserve recommendation is suggested



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



Island Quad Site No  
HAWAII REGISTER OF HISTORIC PLACES  
SHORT FORM

SITE NAME/TYPE Pahoa District

LOCATION Pahoa, Puna, Hawaii

OWNER Various

MERIT: Architectural  Historical "Hilo and the Island of Hawaii", Hawaii Annals  
1910, p. 135-36.

INFORMATION: Written No  Yes: Kinney, Guide to the Island of Hawaii

Informant  No Yes: \_\_\_\_\_

GENERAL DESCRIPTION AND STATEMENT OF SIGNIFICANCE:

The town of Pahoa is interesting for its association with the lumber industry and its historical pattern of settlement. It is being recommended for reserve status.

The town of Pahoa is located between Hilo and Kalapana. It has a population of approximately 925 people. The small town consists of a Catholic church, a school and gymnasium, a mill camp, a commercial area, as well as scattered residences both old and contemporary.

The town grew up as a result of the lumber industry which opened a large mill in the village around 1907. Described by Kinney in his guide to Hawaii, the lumber company was primarily involved with the process of ohia (metrosideros maxropus), a hardwood. The wood was used to make railroad ties, flooring, shingles, tools and other wooden products although the main production consisted of ties for the Santa Fe Railroad. Koa (acacia) was also milled at the plant in Pahoa. A fire in the factor in the Spring of 1913 shut down the mill for a short period of time while reconstruction of the plant was underway. The mill had facilities for building cars and repairing its machinery. A total of 600 employees were on the company's payroll in 1910 and as the company expanded more were added.

REASON FOR USE OF SHORT FORM: Lack of historical information

SURVEYED BY John C. Wright RECOMMENDATION Reserve

DATE OF SURVEY December, 1973 F-8 KEY Various

LOCATION MAP IS DRAWN ON OPPOSITE SIDE OF SHORT FORM

ARCHAEOLOGICAL COVER SHEET

HAWAII REGISTER OF HISTORIC PLACES

50 - 1 0 - 5 5 - 7 3 8 8 SITE NAME/TYPE: Pahoe Commercial District  
1 2 3 4 5 6 7 8 9 DISTRICT: Puna  
 SITE IDENTIFICATION NUMBER AREA: \_\_\_\_\_ square \_\_\_\_\_ s  
2 1 CATEGORY: Single Feature  Complex Places  
10 11 12 13 14 15 16 17 18 19 20 OWNERSHIP: Public  Private  
 CARD No. DATE/PERIOD PHOTOGRAPHS:  Yes No (Temp/Tech)  
 PRESENT LAND USES: Comm.; Residential KNOWN PRESSURES ON SITE: None known  
 DESTRUCTION:  No Known Future Danger Possible Future Danger Future Danger Certain  
Present Danger Presently Being Destroyed  
 STATUS:  Occupied Unoccupied CONDITION: Excellent  Good  Fair Deteriorat  
 INTEGRITY:  Unaltered, Orig Loc Unaltered, Moved Altered, Orig Loc Altered, Moved  
 ACCESSIBILITY:  Unrestricted  Restricted Inaccessible  
 LEGENDARY MATERIALS KNOWN: Yes  No WRITTEN HISTORICAL MATERIALS: Yes  No  
 IMPORTANCE AS EXAMPLE OF TYPE SITE:  Good Moderate Poor  
 SUSCEPTABILITY TO INTERPRETATION:  Good Moderate Poor  
 RESEARCH POTENTIAL: Good  Moderate Poor  
 LOCAL ATTITUDES ABOUT SITE: Valuable Moderate Value Low Value  Ambivalent Unknow  
 BRIEF DESCRIPTION (Columns 21-80): Commercial district consisting of one and two  
story false front buildings as well as gabled structures; Some have been  
renovated and have new siding  
 STAFF EVALUATION: High Value Valuable  Reserve Marginal  
 SUGGESTED THEMES: 06; 36 Commerce; Habitation  
 DATE SUBMITTED TO REVIEW BOARD: \_\_\_\_\_

REVIEWER'S RECORD AND EVALUATION

NAME: \_\_\_\_\_ DATE REVIEWED \_\_\_\_\_  
 CATEGORY: High Value Valuable Reserve Marginal  
 SIGNIFICANCE: National State Local  
 RECOMMENDED DISPOSITION: Nominate National Register State Register Staff Files  
 RECOMMENDED THEMES: \_\_\_\_\_  
 REVIEWER'S COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

REVIEW BOARD EVALUATION RECORD

DATE REVIEWED: \_\_\_\_\_ RECORDER: \_\_\_\_\_  
 OFFICIAL CATEGORY: High Value Valuable Reserve Marginal  
 OFFICIAL SIGNIFICANCE: National State Local  
 OFFICIAL THEMES: \_\_\_\_\_  
 OFFICIAL DISPOSITION: National Register Nomination State Register Staff Files  
 REVIEW BOARD COMMENTS: \_\_\_\_\_  
 VOTING RECORD: Daws \_\_\_\_\_ Hormann \_\_\_\_\_ Jackson \_\_\_\_\_ Kikuchi \_\_\_\_\_  
 Lind \_\_\_\_\_ Mark \_\_\_\_\_ Nagata \_\_\_\_\_ Paglinawan \_\_\_\_\_  
 Roche \_\_\_\_\_ Tuggle \_\_\_\_\_

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



Island Quad Site No.  
HAWAII REGISTER OF HISTORIC PLACES  
SHORT FORM

SITE NAME/TYPE Pahoa Commercial District

LOCATION Pahoa, Puna, Hawaii

OWNER Various

MERIT:  Architectural  Historical

INFORMATION: Written  No  Yes: \_\_\_\_\_

Informant  No  Yes: Anonymous informants

GENERAL DESCRIPTION AND STATEMENT OF SIGNIFICANCE:

The commercial district in Pahoa is a mixture of on going businesses and store front residences. Set along both sides of the road the commercial district stretches for approximately one fifth mile. the first building in this area is building number five (see sketch). This one-story board and batten structure is a residence. It is elevated over a garage area and has a front porch two bays long. The porch is enclosed with elongated diamond patterned balusters. Building six has a roof line composed of intersecting gables. A front porch is protected by a shed roof. Shingles on the gable ends are the only distinguishing feature. The structure is a residence. Building number seven is partially covered with boards and battens and has a gable roof. A front lobby-like area may indicate the structure's earlier function as a hotel or boarding house. Today the building is used as a residence. Building number eight is a one-story false front structure that once served as a store. It is presently being used as a residence. Building number nine is a two-story false front structure with horizontal siding on the second floor. Modern additions in-

REASON FOR USE OF SHORT FORM: Lack of historical information

SURVEYED BY John C. Wright RECOMMENDATION Reserve

DATE OF SURVEY December, 1973 F-10 X KEY Various (see Attached Site

LOCATION MAP IS DRAWN ON OPPOSITE SIDE OF SHORT FORM

## HAWAII REGISTER OF HISTORIC PLACES

## HISTORICAL SITES INFORMATION AND REVIEW FORM---CONTINUATION SHEET

Please note subject heading (Statement of Significance, etc.; use separate sheet for each heading).

Pahoa Commercial District- continuation page 2

clude sliding windows. Building number ten is a one-story false front structure with a two-story gabled house in the rear. The house is covered with boards and battens. The front building has carved brackets below the cornice line. Buildings eleven and twelve are identical with a one-story false front facade. Each has three double hung windows with four vertical panes. Building number thirteen is a smaller one-story structure with a false front. One large window area is composed of four square panes. Building number fourteen is a two-story false front structure with a second floor balcony. Diamond patterned balusters distinguish the building from the other store fronts. Building number fifteen is a single story false front structure with a front wooden porch. The Yamaguchi Store is building number sixteen. This two-story false front store used to be Shigi Store. A band of windows opens up the architrave on the first floor. The S. Miura Store is building number seventeen and is covered with brick and new siding. A two step false facade articulates the one-story structure. Tsubota's Funa Tavern and Snack Shop is located next to the Miura Store. It is building number eighteen on the sketch. This one-story false front building is similar to the two buildings flanking it although its false front is higher than the other two. Building number nineteen is the T. Momita Store and architecturally the building resembles number seventeen and eighteen. Building number twenty is a two-story gabled structure with a second floor balcony. A diamond pattern balustrade is located on the top floor and the building

HAWAII REGISTER OF HISTORIC PLACES

HISTORICAL SITES INFORMATION AND REVIEW FORM---CONTINUATION SHEET

Please note subject heading (Statement of Significance, etc.; use separate sheet for each heading).

Pahoa Commercial District- continuation page 3

still has its original wood porch on the street level while others have replaced these wooden planks with more durable concrete. Building number twenty-one is similar to building nine and is in the process of being renovated. New siding is being applied and new window frames are being added. A group of three one-story gabled houses with small front porches constitute building number twenty-two on the drawing. Building twenty-three is identical to building fourteen and building twenty-four is a one-story false front structure painted red with green trim. Boards and battens cover the building's side.

Across the street is building number twenty-five which is a one-story false front structure similar to others in the commercial district. Building twenty-six and twenty-seven are stores. Twenty-six is a two-story gabled structure with a corrugated iron roof. A glass architrave adds to the otherwise undistinguished building. The Pahoa Cash and Carry Store owned and operated by T. Hara has been recently renovated. A two-story section is centrally located and the store has an indented entrance area. Building twenty-eight is the Young Buddhist Association building which is a two-story wood structure with a curved hip roof. A second floor balcony and the rock walls and posts on the entrance are a visual relief from the continuous wood facade of the rest of the commercial area. Set on a small intersecting street is building number twenty-nine which is the Akebono Theatre. This gabled structure has an elevated porch now cement covered, and a slightly arched entranceway. Boards and

## HAWAII REGISTER OF HISTORIC PLACES

## HISTORICAL SITES INFORMATION AND REVIEW FORM---CONTINUATION SHEET

Please note subject heading (Statement of Significance, etc.; use separate sheet for each heading).

Pahoa Commercial District- continuation page 4

battens articulate the sides of the building.

On the corner is a two-story building which continues around the curve of the street. Brackets appear below the cornice line. This building contains the majority of Pahoa's operating businesses, which include Margaret's Gallery, the Bank of Hawaii, Toma's Restaurant, Ohbayashi-Tokyo Company, general contractors, Lanipuna Gardens office and the office for the Door of Faith. Adjacent are buildings thirty-one, thirty-two, and thirty-three all of which are one-story false front structures with brackets below the cornice line. Building number thirty-four is a two-story false front structure with first floor display windows and four glass doors on the front. Small projections shade double hung windows on the top floor.

Many of the town's commercial establishments have been closed for over ten years. Although these structures no longer operate they are not abandoned. Many have been converted to residences. The shutting down of the lumber mill was one of the factors in the gradual decrease in the town's importance as an urban center. The expansion of the Funa Sugar Company, however, has helped to maintain some of the town's businesses. With the advent of speedier means of transportation Pahoa became less of an isolated town. The need to be self-sufficient decreased and today many of the town's people go into Hilo for their commercial activities. Pahoa is struggling to stay alive.

ARCHAEOLOGICAL COVER SHEET

HAWAII REGISTER OF HISTORIC PLACES

50 - 1 0 - 5 5 - 7 3 8 8  
1 2 3 4 5 6 7 8 9  
SITE IDENTIFICATION NUMBER

2 1  
10 11 12 13 14 15 16 17 18 19 20  
CARD No. DATE/PERIOD

PRESENT LAND USES: Educational

DESTRUCTION:  No Known Future Danger  Possible Future Danger  Future Danger Cert. (n.)  
 Present Danger  Presently Being Destroyed

STATUS:  Occupied  Unoccupied  Excellent  Good  Fair  Deteriorated

INTEGRITY:  Unaltered, Orig Loc  Unaltered, Moved  Altered, Orig Loc  Altered, Moved

ACCESSIBILITY:  Unrestricted  Restricted  Inaccessible

LEGENDARY MATERIALS KNOWN:  Yes  No WRITTEN HISTORICAL MATERIALS:  Yes  No

IMPORTANCE AS EXAMPLE OF TYPE SITE:  Good  Moderate  Poor

SUSCEPTABILITY TO INTERPRETATION:  Good  Moderate  Poor

RESEARCH POTENTIAL:  Good  Moderate  Poor

LOCAL ATTITUDES ABOUT SITE:  Valuable  Moderate Value  Low Value  Ambivalent  Unfavorable

BRIEF DESCRIPTION (Columns 21-80): Three separate buildings; one is a gymnasium with a hip roof; second building consists of classroom and also has a hip roof; third building has intersecting gable roof; all wood

STAFF EVALUATION:  High Value  Valuable  Reserve  Marginal

SUGGESTED THEMES: 09 Education

DATE SUBMITTED TO REVIEW BOARD:

REVIEWER'S RECORD AND EVALUATION

NAME: DATE REVIEWED

CATEGORY:  High Value  Valuable  Reserve  Marginal

SIGNIFICANCE:  National  State  Local

RECOMMENDED DISPOSITION:  Nominate National Register  State Register  Staff Files

RECOMMENDED THEMES:

REVIEWER'S COMMENTS:

REVIEW BOARD EVALUATION RECORD

DATE REVIEWED: RECORDER:

OFFICIAL CATEGORY:  High Value  Valuable  Reserve  Marginal

OFFICIAL SIGNIFICANCE:  National  State  Local

OFFICIAL THEMES:

OFFICIAL DISPOSITION:  National Register Nomination  State Register  Staff Files

REVIEW BOARD COMMENTS:

VOTING RECORD: Daws \_\_\_\_\_ Hormann \_\_\_\_\_ Jackson \_\_\_\_\_ Kikuchi \_\_\_\_\_  
Lind \_\_\_\_\_ Mark \_\_\_\_\_ Nagata \_\_\_\_\_ Paglinawan \_\_\_\_\_  
Roche \_\_\_\_\_ Tuggle \_\_\_\_\_

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



10 / 22 / 1900  
Island Quad Site No.  
HAWAII REGISTER OF HISTORIC PLACES  
SHORT FORM

SITE NAME/TYPE Pahoa School  
LOCATION Pahoa, Puna, Hawaii  
OWNER State of Hawaii, Dept. of Education

MERIT:  Architectural  Historical  
INFORMATION: Written  No  Yes: \_\_\_\_\_  
Informant  No  Yes: \_\_\_\_\_

GENERAL DESCRIPTION AND STATEMENT OF SIGNIFICANCE:

The Pahoa school consists of three buildings including a hipped-roofed building, a gym with a hip roof and a one-story addition, and a third building with a roof line of intersecting gables. The buildings are typical of school architecture seen in the state and were surveyed as part of the Pahoa district.

REASON FOR USE OF SHORT FORM: Lack of historical and architectural import

SURVEYED BY John C. Wright RECOMMENDATION Reserve

DATE OF SURVEY December, 1973 F-15 KEY 1-5-144-25 and 26

LOCATION MAP IS DRAWN ON OPPOSITE SIDE OF SHORT FORM

ARCHAEOLOGICAL COVER SHEET

HAWAII REGISTER OF HISTORIC PLACES

50 - 1 0 - 5 5 - 7 3 8 8      SITE NAME/TYPE: Mill Camp  
           1 2    3 4    5 6 7 8 9      DISTRICT: Puna  
           SITE IDENTIFICATION NUMBER      AREA: \_\_\_\_\_ square \_\_\_\_\_ s  
2 1 0 1 9 1 0 \_\_\_\_\_      CATEGORY: Single Feature  Complex \_\_\_\_\_ Places  
 10 11 12 13 14 15 16 17 18 19 20      OWNERSHIP: \_\_\_\_\_ Public  Private  
 CARD No.      DATE/PERIOD      PHOTOGRAPHS:  Yes \_\_\_\_\_ No (Temp/Tech)  
 PRESENT LAND USES: Residential      KNOWN PRESSURES ON SITE: None known  
 DESTRUCTION:  No Known Future Danger \_\_\_\_\_ Possible Future Danger \_\_\_\_\_ Future Danger Certain  
    Present Danger \_\_\_\_\_ Presently Being Destroyed  
 STATUS:  Occupied \_\_\_\_\_ Unoccupied      CONDITION: \_\_\_\_\_ Excellent \_\_\_\_\_ Good  Fair \_\_\_\_\_ Deteriorate  
 INTEGRITY:  Unaltered, Orig Loc \_\_\_\_\_ Unaltered, Moved \_\_\_\_\_ Altered, Orig Loc \_\_\_\_\_ Altered, Moved  
 ACCESSIBILITY:  Unrestricted \_\_\_\_\_ Restricted \_\_\_\_\_ Inaccessible

LEGENDARY MATERIALS KNOWN: \_\_\_\_\_ Yes  No      WRITTEN HISTORICAL MATERIALS: \_\_\_\_\_ Yes  No  
 IMPORTANCE AS EXAMPLE OF TYPE SITE:  Good \_\_\_\_\_ Moderate \_\_\_\_\_ Poor  
 SUSCEPTABILITY TO INTERPRETATION:  Good \_\_\_\_\_ Moderate \_\_\_\_\_ Poor  
 RESEARCH POTENTIAL: \_\_\_\_\_ Good  Moderate \_\_\_\_\_ Poor  
 LOCAL ATTITUDES ABOUT SITE: \_\_\_\_\_ Valuable \_\_\_\_\_ Moderate Value \_\_\_\_\_ Low Value  Ambivalent \_\_\_\_\_ Unkn  
 BRIEF DESCRIPTION (Columns 21-80): Cluster of dilapidated canohouses composed of  
boards and battens; Gable roofs and small front porches; separate wash  
area with six sinks; Out house with individual doors

STAFF EVALUATION: \_\_\_\_\_ High Value \_\_\_\_\_ Valuable  Reserve \_\_\_\_\_ Marginal  
 SUGGESTED THEMES: 03: 36 Agriculture; Habitation

DATE SUBMITTED TO REVIEW BOARD: \_\_\_\_\_

REVIEWER'S RECORD AND EVALUATION

NAME: \_\_\_\_\_ DATE REVIEWED: \_\_\_\_\_  
 CATEGORY: \_\_\_\_\_ High Value \_\_\_\_\_ Valuable \_\_\_\_\_ Reserve \_\_\_\_\_ Marginal  
 SIGNIFICANCE: \_\_\_\_\_ National \_\_\_\_\_ State \_\_\_\_\_ Local  
 RECOMMENDED DISPOSITION: \_\_\_\_\_ Nominate National Register \_\_\_\_\_ State Register \_\_\_\_\_ Staff Files  
 RECOMMENDED THEMES: \_\_\_\_\_  
 REVIEWER'S COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

REVIEW BOARD EVALUATION RECORD

DATE REVIEWED: \_\_\_\_\_ RECORDER: \_\_\_\_\_  
 OFFICIAL CATEGORY: \_\_\_\_\_ High Value \_\_\_\_\_ Valuable \_\_\_\_\_ Reserve \_\_\_\_\_ Marginal  
 OFFICIAL SIGNIFICANCE: \_\_\_\_\_ National \_\_\_\_\_ State \_\_\_\_\_ Local  
 OFFICIAL THEMES: \_\_\_\_\_  
 OFFICIAL DISPOSITION: \_\_\_\_\_ National Register Nomination \_\_\_\_\_ State Register \_\_\_\_\_ Staff Files  
 REVIEW BOARD COMMENTS: \_\_\_\_\_  
 VOTING RECORD: Daws \_\_\_\_\_ Hormann \_\_\_\_\_ Jackson \_\_\_\_\_ Kikuchi \_\_\_\_\_  
                   Lind \_\_\_\_\_ Mark \_\_\_\_\_ Nagata \_\_\_\_\_ Paglinawan \_\_\_\_\_  
                   Roche \_\_\_\_\_ Tuggle \_\_\_\_\_

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



10 / 55 / 7388  
Island Quad Site No.  
HAWAII REGISTER OF HISTORIC PLACES  
SHORT FORM

SITE NAME/TYPE Mill Camp

LOCATION Pahoa, Puna, Hawaii

OWNER Various

MERIT:  Architectural  Historical

INFORMATION: Written  No  Yes: \_\_\_\_\_

Informant  No  Yes: \_\_\_\_\_

GENERAL DESCRIPTION AND STATEMENT OF SIGNIFICANCE:

Located a few hundred feet from the Pahoa Catholic Church on the south is a small mill camp composed of dilapidated houses. One of the more primitive facilities surveyed, this camp area has a community bath area. Sinks and facilities for bathing are centralized. An outhouse structure with separate doors for private family use is still in use.

The houses are one-story board and batten structures with gable roofs and shed extensions. Water tanks and front porches (some are partially enclosed) are common scenery and some houses have diamond patterned balustrades. Separate garages are located together in a row although many families park their vehicles between the closely clustered houses.

Part of the complex is a wooden store building now used as the Pahoa Filipino Community Association building. This board and batten store structure has a gable roof and a front porch. Double entrance doors and a diamond patterned balustrade distinguish the building from other commercial structures in the area.

REASON FOR USE OF SHORT FORM: Lack of historical information

SURVEYED BY John C. Wright RECOMMENDATION Reserve

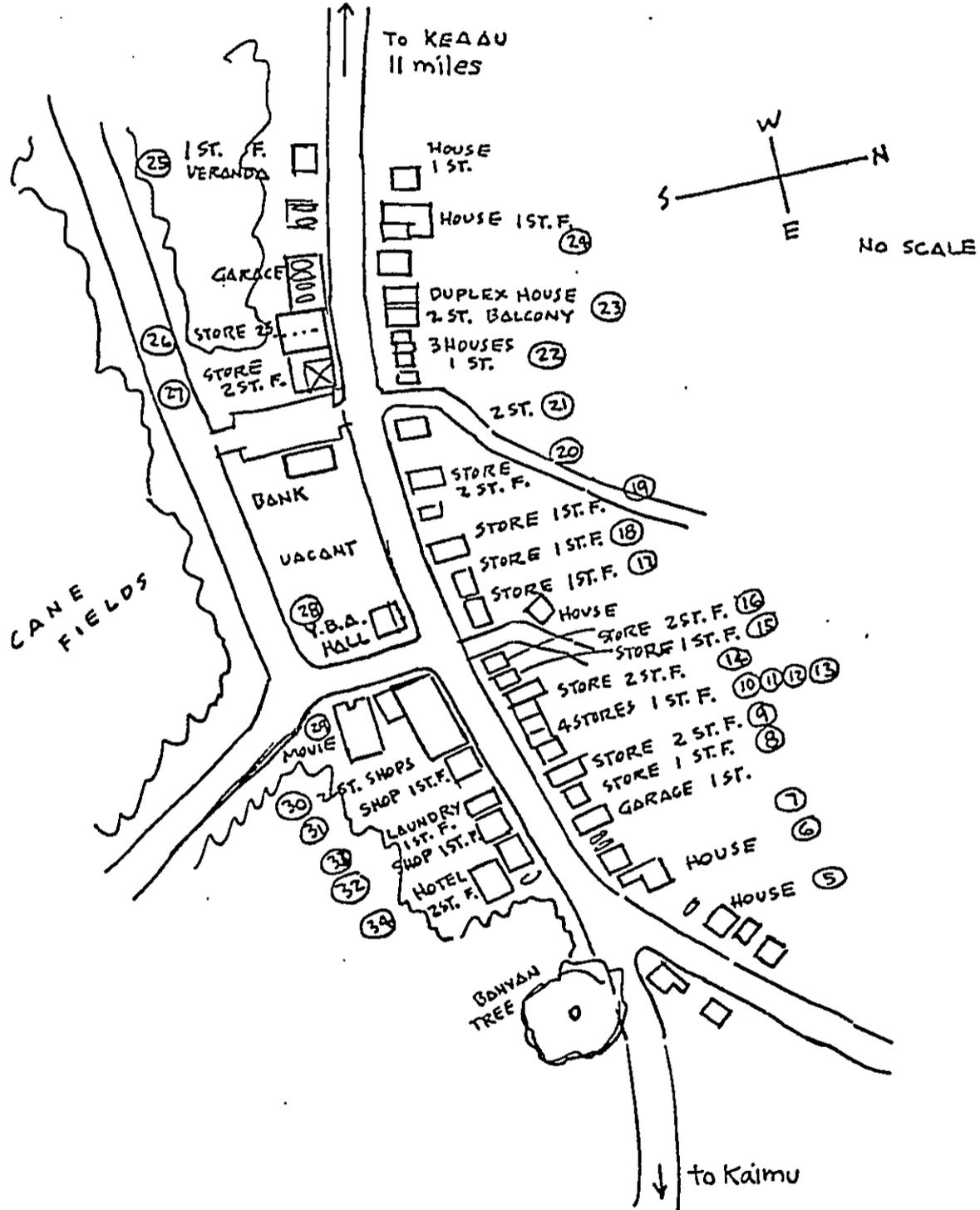
DATE OF SURVEY December, 1973 F-17 KEY \_\_\_\_\_

LOCATION MAP IS DRAWN ON OPPOSITE SIDE: SHORT FORM

HAWAII REGISTER OF HISTORIC PLACES

HISTORICAL SITES INFORMATION AND REVIEW FORM---CONTINUATION SHEET

Please note subject heading (Statement of Significance, etc.; use separate sheet for each heading).



PAHOA COMMERCIAL DISTRICT.  
PUNA, HAWAII.

7388

HAWAII REGISTER OF HISTORIC PLACES

HISTORICAL SITES INFORMATION AND REVIEW FORM---CONTINUATION SHEET

Please note subject heading (Statement of Significance, etc.; use separate sheet for each heading).

Pahoa District Tax Key Numbers

Building # 5	Building # 28	1-5-02-9
6	29	1-5-12-70
7	30	1-5-12-69
8	31	1-5-12-68
9	32	1-5-12-67
10	33	1-5-12-66
11	34	1-5-12-65
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APPENDIX G

May 10, 1977

KEAAU-PAHOA ROAD  
PAHOA BYPASS ROAD  
PROJECT NO. 130AB-01-76

SUMMARY OF INFORMATIONAL MEETING

Place: Pahoia Neighborhood Community

Time and Date: 7:30 P.M. April 27, 1977

Attendance: A total of twenty-nine (29) persons attended this meeting.  
An incomplete list of the people who attended is as follows:

1. Charles Schuster, Hawaii District Engineer,  
State Land Transportation Facilities Division  
(SLTFD)
2. Aivah Miyamoto, Hawaii District, SLTFD
3. George Kodani, Hawaii District, SLTFD
4. Edward Ochiai, Chief, Rights-of-Ways, SLTFD
5. George Shigano, Advance Planning Branch, SLTFD
6. Glen Yasui, Federal Highway Administration
7. Tom Fujii, Councilman, Hawaii County
8. Norman Hayashi, County Planning Department
9. Captain Hayashida, County Police Department
10. Mauricio Valera, Hilo Electric Light Company
11. Charles Wallis, Puna Sugar Company
12. Hiroshi Kasamoto, Planning Consultant
13. James Kuwana, Pahoia Resident
14. Peter Hauanio, Pahoia Resident
15. Edison Kwock, Park Engineering, Inc.
16. John Tanabe, Park Engineering, Inc.

The meeting was opened by Mr. Charles Schuster, who informed the audience that the meeting was very informal and the purpose of the meeting was as follows:

1. To inform the community of the alternative corridors being considered.
2. To solicit comments, questions, objections, recommendations, etc. from the public. Mr. Schuster also stated that the plans would be available at his office and that they are welcome to contact him after the meeting.

The consultants' presentation was then made by Edison Kwock of Park Engineering, Inc. A copy of this presentation is attached.

After the consultants' presentation, Mr. Schuster solicited questions and comments from the floor. Answers to questions from the floor were as follows:

1. If a bypass alternative is selected, there will be connector roads between the bypass and the existing road through Pahoa Town. However, the planning, design and construction of these connector roads would be a County responsibility.
2. An economic impact study has not been made, but these studies will be made as the study progresses.
3. A detailed land use study has not been made; however, these studies will be made.

The following are comments made from the floor:

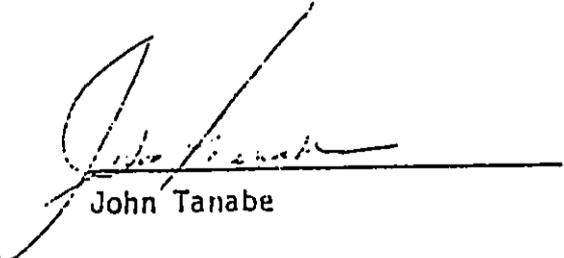
1. Hiroshi Kasamoto. At present, a makai alignment is being recommended in the "draft" Urban Design Plan, Keaau and Pahoa; but it is subject to review by governmental and private agencies. The bases for this recommendation are: a) shorter route (as compared to the mauka bypass alternative) from Keaau to the Pahoa-Kalapana-Kapoho Junction, b) more existing connector roads between the existing Pahoa Road to the makai bypass, c) Route "C", improvement of existing road, would destroy historical areas, and d) the existing street patterns and buildings should be preserved to retain the "flavor of the

existing town, any widening would destroy one side or the other of the town. Hiroshi also stated that the amount of traffic that will be generated in 10 to 15 years will be so large that it will interfere with parking, local traffic and people shopping (if Alternate "C" is selected). Therefore, traffic and congestion could also kill a town.

2. Captain Hayashida. (Police Department) Prefers makai alternative so that the cane haul trucks would be eliminated from the road through Pahoa Town.
3. Charles Wallis. (Puna Sugar Company) If Alternative "A" or "B" is selected, no cane haul trucks would pass through Pahoa Town.
4. Glen Yasui. (FHWA) Construction of the Chain of Craters Road is scheduled to begin in August or September of 1977 and should be opened for traffic in early Fall of 1978.
5. Mauricio Valera. (HELCO) HELCO prefers a bypass alternative so that the existing 33 KVA Transmission Line through Pahoa Town can be relocated.
6. Alternatives "D" and "E" would not relieve traffic from the Kapoho direction, unless people are forced to use the bypass. Reasons being that "D" and "E" are more indirect routes to Keaau and also the grade is adverse (uphill).
7. James Kuwana. About 20 years ago, the community defeated a bypass road. However, in reply to Mr. Schuster's question, he said that the community is not presently opposed to a bypass, but they would probably oppose the mauka alternatives.
8. Peter Hauanio. (Representing the Hawaiian group in the community) Favors Alternative "A".

A set of the plans, used for the wall displays, was left with Peter Hauanio.

In closing, Mr. Schuster informed the public that this is only the first public contact and further meetings and a legal public hearing will be held as the plans are developed. The meeting was adjourned about 8:30 P.M.



John Tanabe

INFORMATIONAL MEETING NARRATIVE  
FOR  
KEAAU-PAHOA ROAD, PAHOA BYPASS  
Project No. 130AB-01-76  
April 27, 1977

Thank you, Mr. Schuster.

Good evening, Ladies and Gentlemen.

INTRODUCTION

The scope of this study is to evaluate alternative corridors for a road either through or around Pahoa Town and to select the best alternate for implementation. We would like to emphasize that this is a corridor planning project and not a design project.

(SLIDE 1) The study area is shown on this slide. Hilo is to the left of the slide, Kapoho to the right and Kalapana to the lower right hand corner. Generally, the selected corridor will go either makai of Pahoa Town as shown by the blue arrows, mauka of Pahoa Town as shown by the brown arrows, or along the existing Keaau-Pahoa Road as shown by the red arrows. The project starts in the vicinity of Kahakai Boulevard, thru or around Pahoa Town and ends about 2.8 miles from the Pahoa School Intersection.

OBJECTIVES

The objectives of this study are:

1. Obtain public input, as we are soliciting tonight
2. Coordination with interested parties

3. Assessment of social, economic and environmental impacts of the project
4. Development of feasible plans and construction costs
5. Select a corridor

#### EXISTING ROADWAYS

(SLIDE 2) The existing roadway network is shown on this slide. Keaau-Pahoa Road is a direct route to the Kalapana-Kaimu area. It also serves as a circuitous route to or from the Hawaii Volcanoes National Park via the Chain of Craters Road. Although the Chain of Craters Road is closed, at the present time, service should be restored by the fall of 1978. Re-construction, of the eleven mile section, that was destroyed by lava, is expected to start this summer.

#### NEED FOR IMPROVEMENT

The existing two lane, 2-way road has narrow pavement, poor alignment, limited parking and short sight distances.

The projected 1990 Average Daily Traffic (ADT) for Keaau-Pahoa Road, just north of Pahoa Town, is 7,880 vehicles as compared to the 1976 ground count of 3,600 vehicles, an increase of 119%. By the year 2000, ADT is expected to increase to 11,080 cars.

Thus, increased traffic will increase congestion, noise and air pollution, and decrease safety within Pahoa Town.

### LAND USE AND OWNERSHIP

Most of the land directly affected by this study is zoned agricultural, its use being predominantly active and inactive sugar cane fields and open areas.

The General Plan for the Puna District shows alternate urban expansion of low, medium and high density uses directed to the makai side of Pahoia Town.

The larger land owners affected by the study are 1) the Roman Catholic Church, 2) Puna Sugar Co., and 3) the State of Hawaii.

Registration of the Pahoia Commercial District in the State Register of Historic Places is pending and will probably restrict the type of improvement allowed within the commercial district.

### ALTERNATIVE CORRIDORS

Five alternates are being considered; two makai, two mauka, and one along the existing Keaau-Pahoia Road. The preliminary design standards for the by-pass alternates are:

(SLIDE 3) 1) a design speed of 65 mph with a posted speed of 55 mph based on the posted speeds outside of Pahoia Town and,

2) a right-of-way width of 100'. This includes 2-12' lanes and 10 foot shoulders.

The mauka and makai by-pass corridors will reduce noise and air pollution within Pahoia Town by diverting traffic away from the center of town.

The preliminary design standards for the corridor along the existing road are:

(SLIDE 4) 1) design speed of 30 mph and,

2) a right-of-way width of 50'. This includes 2-12' lanes, one 8' parking lane and 8' sidewalks on both sides of the road.

As mentioned previously, inclusion of the Pahoa Commercial District into the State Historic Register will probably restrict improvement to the existing road.

The next slide shows the alternates. Hilo is to the left of the slide, Kapoho to the right and Kalapana is to the bottom right hand corner. There are five (5) alternates.

#### Alternate "A"

Alternate "A", as shown in orange, is the makai most route. It swings east from Keaau-Pahoa Road by-passing Pahoa Town. Twelve lots are affected by the corridor. Of the twelve lots, eleven are zoned agricultural and one zoned residential.

This alignment allows for future expansion between the existing town and the new corridor. Water service can be extended to these areas without changing the water service elevation.

Construction along Alternate "A", as well as Alternate "B", will eliminate the need to route cane haul trucks through Pahoa Town during harvesting in the makai fields.

Alternate "B"

Alternate "B", as shown in blue, provides a makai corridor close to the existing town.

Sixteen parcels are affected by this corridor. Pahoa Town could expand on the makai side of the corridor, but only limited area is available between the town and the corridor. As in Alternate "A", water service can be extended to these areas without changing the water service elevation.

The corridor alignment is more curvilinear than Alternates "A", "D" or "E".

Alternate "C"

Alternate "C", as shown by the dashed line, is a corridor along the existing Keaau-Pahoa Road. To improve the existing road, realignment of a section of the road will be necessary as well as substantial road grade adjustments near the Sacred Heart Church.

Removal of a portion of some buildings within the proposed State Historic Site District will probably also be necessary.

Within Pahoa Town, as traffic increases in the future, air and noise pollution will intensify, traffic congestion will increase and free movement of vehicles limited.

Alternate "D"

Alternate "D", as shown in red, is a mauka corridor close to Pahoa Town. This corridor, however, passes thru portions of Pahoa Playground, shown in blue, and Pahoa School, shown in orange.

Seventeen lots are affected, six of them zoned residential and the remaining zoned agricultural.

Alternate "E"

Alternate "E", as shown in green, swings west by-passing improvements in Pahoa Town. Eleven lots, zoned agricultural, are affected by this corridor. Expansion of Pahoa Town toward and beyond Alternate "E" is above the existing water service elevation. Additional reservoirs may be required.

This corridor passes mauka of the proposed acquisition for Pahoa School, as shown in the "Complex Development Report, Pahoa High and Elementary School". (Point to area.) Future expansion should be unaffected by the corridor. This mauka corridor will allow through traffic to by-pass the school, thereby reducing the hazard of high speed traffic along a major portion of the school.

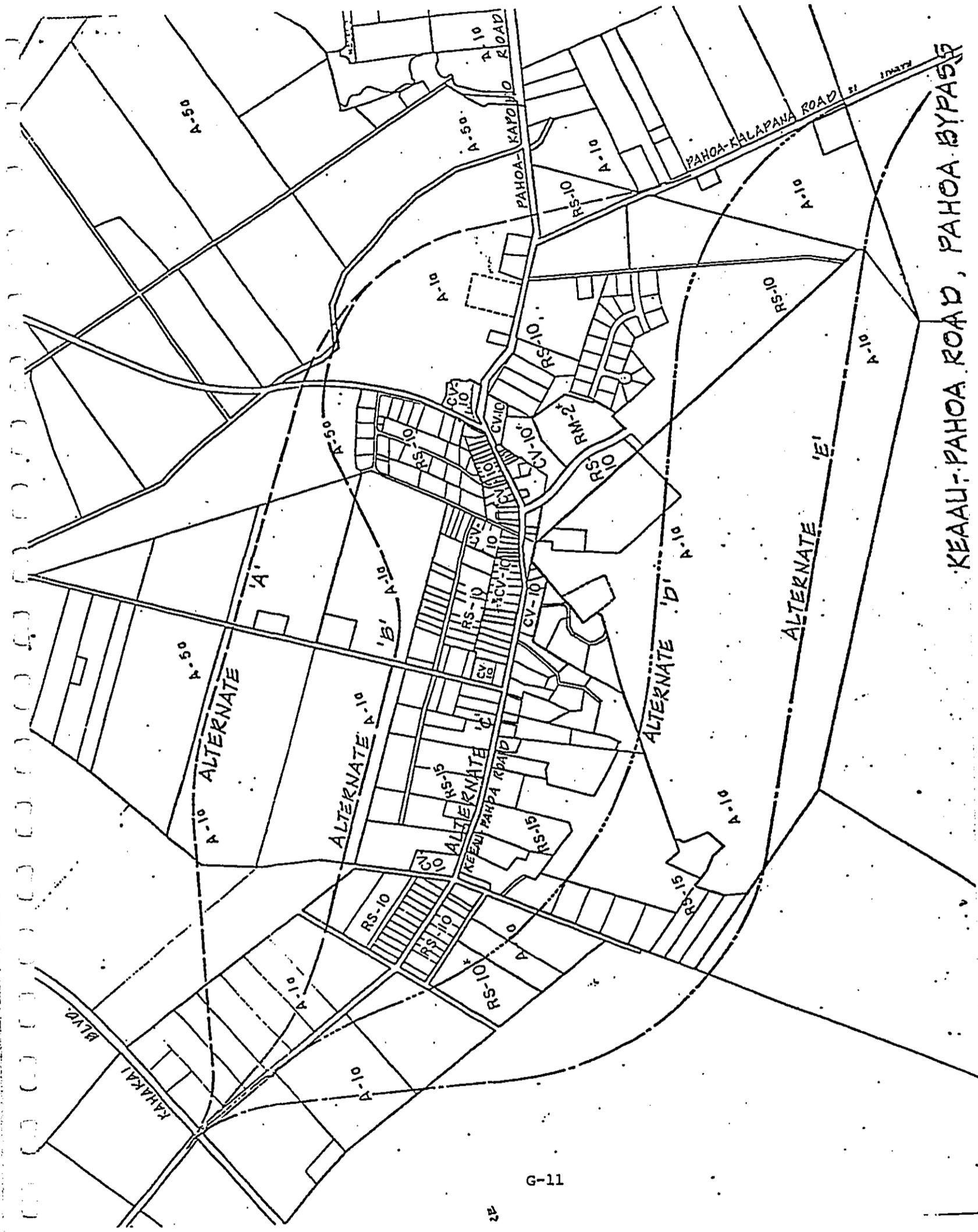
Do Nothing Alternative

The alternative to improving Keeau-Pahoa Road is do nothing. This is also a possible recommendation of the study.

PAHOA-KALAPANA ROAD IMPROVEMENT

In conjunction with the improvement of the road system in Pahoa, it is proposed to improve existing Pahoa-Kalapana Road from the Pahoa School Intersection for approximately 2.8 miles. This improvement will consist of reconstructing existing lanes to 12 feet, widening the right-of-way, adjusting grades and providing wider shoulders so that roadways in the area are compatible.





KEAAU-PAHOA ROAD, PAHOA BYPASS

G-11

28

November 3, 1977

KEAAU-PAHOA ROAD  
PAHOA BYPASS ROAD  
PROJECT NO. 130AB-01-76

SUMMARY OF SECOND INFORMATIONAL MEETING

PLACE: Pahoa Neighborhood Community Center

DATE: October 27, 1977

ATTENDANCE: A total of sixty-five (65) persons attended the second informational meeting. A partial list of those in attendance includes:

1. Charles Schuster, Hawaii District Engineer, SLTFD
2. George Kodani, Hawaii District, SLTFD
3. Hugh Ono, Hawaii District, SLTFD
4. Edward Ochiai, Chief, Right-of-Ways, SLTFD
5. George Shigano, Advance Planning Engineer, SLTFD
6. Tom Fujii, Councilman, Hawaii County
7. Robert Yamada, former Council Chairman
8. Rodney Nakano, Planning Department, Hawaii County
9. Captain Hayashida, Police Department
10. Charles Wallis, Puna Sugar Company
11. Hiroshi Kasamoto, Planning Consultant
12. Philip Yoshimura, Planning Consultant
13. James Kuwana, Pahoa Resident
14. Sadamu Tsubota, Pahoa Resident
15. Peter Hauanio, Pahoa Resident
16. John Sosa, Vice Principal, Pahoa School
17. John Tanabe, Park Engineering, Inc.
18. Edison Kwock, Park Engineering, Inc.

The breakdown of the audience by ethnic groups was two (2) Filipinos, sixteen (16) Hawaiians, nineteen (19) Caucasians, and twenty (20) Orientals. Thirteen (13) females and forty-five (45) males attended the meeting.

The meeting was called to order at 7:30 P.M. by Mr. Charles Schuster, who informed the audience that this was an informal meeting to discuss the status of the project for a road through or around Pahoa Village and to obtain their comments and reactions on the work done to date.

The Consultant's presentation was made by Edison Kwock of Park Engineering, Inc. A copy of the presentation is attached.

After the presentation, Mr. Schuster asked for questions and comments from the floor.

A summary of comments and answers to questions were as follows:

1. The small amount of cane land removed from production by Alternate "A" would be far outweighed by the advantages of not routing cane trucks through the Village. Alternate "E" would not displace any productive cane land. (Charles Wallis of Puna Sugar Co.)
2. The bypass corridors were chosen to minimize the displacement of homes and to allow sufficient area between the existing and the bypass for future expansion, as outlined in the urban plan.
3. Costs for a route following the existing Keaau-Pahoa Road and then providing an overhead structure with ramps to Kalapana would be prohibitive and would have severe adverse impacts on the Village.
4. A suggestion that for a five-year period, residents of Pahoa receive preferential treatment for commercial rezoning of land along the bypass, was referred to the County planning representative present.
5. Assumptions used to prepare the traffic assignment included past traffic counts, adjustments for the General Plan, projected increase in population and growth of the area, and reconstruction of the lava damaged Chain of Craters Road. The impact of the future Puna Coastal Highway was considered, but not used since construction of the road would be in the distant future.
6. A request was made that a study be made to move the bypass take-off point as far back as the air strip, thereby moving congestion away from Kahakai Boulevard. Irregardless of where the take-off point is located, that intersection will be a major intersection. Channelization and other intersection details will be considered in the design phase.

7. Robert Yamada: The legislature had some intention of Kalapana as a destination point because of the funds expended for improving Kalapana Road from the water tank to Kalapana and the water system. He mentioned that he owns land in Pahoa and Kalapana and felt that:
  - a. Pahoa would lose Kapoho traffic to Alternate "A"
  - b. Alternate "E" would get the best contract bid price
  - c. Alternate "E" would not interfere with school expansion
  - d. Although the bypass road would primarily be used by the people of Pahoa, Puna and the Volcanoes area, the road belongs to the people of Hilo and the entire County of Hawaii. The action taken should benefit not only the people of Pahoa, but the entire island since the road will have a broad impact
  - e. Alternate "E" should be selected
8. An objection was made to the selection of Alternate "E". If Alternate "E" is selected, the benefits to Kapoho bound traffic would be significantly less than if Alternate "A" is selected.

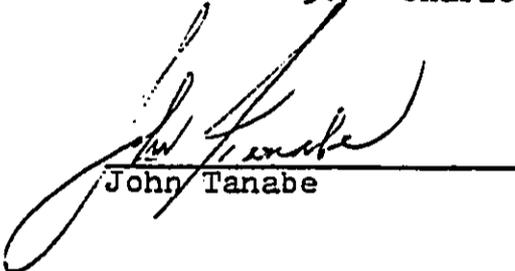
Connecting roads between the bypass alternates and the existing road should be shown.
9. A connection from the Pahoa-Kapoho intersection to Alternate "E" through Pahoa School was proposed to provide a more direct route for Kapoho residents using Alternate "E". It was pointed out that disruption of the school site would be unacceptable.
10. Construction would begin sometime in 1980, following the completion of the planning study, design of the road and preparation of contract plans, contingent upon the availability of funds.

There being no further questions, the meeting was adjourned at 8:30 P.M.

Evaluation of Contacts with Public:

Informal discussions with residents after the meeting appeared to indicate that they supported a makai route. Among those favoring the makai route at the meeting were:

1. Peter Hauanio, Pahoa Resident
2. James Kuwana, Pahoa Resident
3. John Sosa, Vice Principal, Pahoa School
4. Truck farmers and residents of Kapoho
5. Charles Wallis, Puna Sugar Company



John Tanabe

Retained Consultants for the Proposed Keaau-Pahoa, Pahoa By-Pass Road

(FAS 130)

Engineering Consultant: Park Engineering, Inc.

Environmental Consultants:

Environmental Impact Statement: Environmental Communications, Inc.

Socioeconomic Consultant: Robert N. Anderson, Ph.D.

Air Pollution Consultant: Barry D. Root, M.A., M.P.H.

Noise Consultant: Dr. Iwao Miyake

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
**MEMORANDUM**

APPENDIX I

DOT 1-027  
(Rev. 11/68)

LT-RM  
3.45090

TO: LT-P

DATE: JUL 28 1977

FROM: LT-R

SUBJECT: CONCEPTUAL RELOCATION PROGRAM PLAN, KEAAU-PAHOA, PAHOA BYPASS ROAD, PROJECT NO. 130AB-01-76 AND PAHOA-KALAPANA ROAD IMPROVEMENT

This conceptual stage relocation program plan, together with attachments, is submitted as requested by Project Engineer, Douglas Orimoto.

A field inspection of the proposed alternates was conducted during the period June 15 - 17, 1977 and a discussion of our findings and the indications presented thereby, including relocation problems, if any, and their probable solutions, are presented as follows for each of the various routes under consideration for the subject project:

General Location and Description of the Project Impact Area:

The proposed Keaau-Pahoa Road, Pahoa Bypass Road, Project No. 130AB-01-76, approximately 1.3 miles in length, presents three (3) corridor locations involving five (5) alternate route locations situated at Pahoa Town, Puna District, County and Island of Hawaii. Pahoa is located twenty (20) miles from the City of Hilo.

The proposed Pahoa-Kalapana Road Improvement, located at the outskirts of Pahoa, runs approximately 2.8 miles from Pahoa towards Kalapana. This road improvement project connects with the Pahoa Bypass schemes near the vicinity of the Kapoho-Kalapana Road junction.

The Puna District, located on the southeastern end of the Island of Hawaii, is bounded by the Pacific Ocean, the South Hilo District to the north and the Ka'u District to the south. This predominantly agricultural-zoned district is divided into Census Tracts 210, which includes the towns of Keaau and Mountain View, to the north and 211 to the south, in which the town of Pahoa is located. More specifically, both projects are located within Census Tract 211 (the Pahoa-Kalapana tract) of the Puna District.

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Census Tract 211, within which the project impact area is located, had a population of 1,352 with 325 families and 430 households as of April 1, 1970. The median family income and the median income for unrelated individuals (1969) were \$7,603 and \$3,019, respectively. Of the total families within the Pahoa-Kalapana tract, 34 families (12.1%) had incomes below the poverty level and 22 families (7.8%) had public assistance incomes. 82.7% of the population was non-white with the major proportion being the Japanese and Filipino groups making up 60.2% of the population followed by 35.1% being Hawaiian and Caucasian. (For Population and Ethnic Distribution, see Attachments 1 and 2.)

Based on the 1970 Census, of the 407 total workers residing in the Pahoa-Kalapana tract, 44.2% (180 workers) were employed in the Other Industries (presumably agriculture) sector with 43.7% (178 workers) in the Farm Workers Occupational Group. (For reference, see Selected Population and Manpower Characteristics, Attachment 2.)

"Makai Corridor (Alternate A and Sub-Alternate A1):

General:

Alternate A and Sub-Alternate A1 are route locations within the corridor location that bypasses the town of Pahoa on its makai (northeastern/ocean) side. These two (2) alternate routes are new route locations having common alignments, excepting for their beginning and ending termini, running from the vicinity of the Kahakai Boulevard/Keaau-Pahoa Road intersection to the vicinity of the Keaau-Pahoa/Pahoa-Kapoho/Pahoa-Kalapana Roads junction. Each alternate continues towards Kalapana by connecting to the proposed Pahoa-Kalapana Road Improvement Project.

Alternate A:

This alternate route involves the whole or partial taking of twenty-three (23) parcels of land which are zoned and affected as follows:

PROPERTIES AFFECTED

APPARENT OCCUPANT AND IMPACT	Total No. Affected	Single Family Residential (RS)			Agricultural (A)					
		RS-10			A-1a			A-5a		
		# of Par- cels	Whole Take	Part Take	# of Par- cels	Whole Take	Part Take	# of Par- cels	Whole Take	Part Take
Parcels Affected	23	1	0	1	15	1	14	7	0	7
Residential Displace- ment	1						1			
Displacement of Combina- tion Residence and:	Nursery	1				1				
	Mac-Nut Farm	1					1			
Agricultural Products Affected:	Cane	8		1			2			5
	Mac-Nut Grove	1					1			

As indicated on the above chart, this alternate is anticipated to displace three (3) residential occupants, thought to be owner-occupant families, of which two (2) appear to operate a part or full-time nursery (1) and macadamia (storage/processing warehouse) farm (1) and the third used for dwelling purposes only.

Also affected will be portions of cane lands (5 parcels) and, seemingly, a portion of a macadamia grove. It appears that the farming operations can continue on the remainder properties. Aside from compensation for crop (cane) damages and productive macadamia trees affected, together with their attendant irrigation and supportive systems, if any and affected, no relocation and/or relocation problems are anticipated nor foreseen.

Residential purchase replacement dwellings and lots and a limited number of rental replacement dwellings are available in the various subdivisions located about 1 or 4 miles from the town. As shown in the listing below, compiled from the Multiple Listing Service (MLS), these replacement dwellings are primarily on agricultural/residential (A-1a) zoned land, more recent in construction and are set apart and distant from the town:

		INVENTORY OF DWELLINGS BY NUMBER OF BEDROOMS			
Location		2-Bedrooms	3-Bedrooms	4-Bedrooms	5 or More Bedrooms
Hawaiian Paradise Park Subdivision  4 miles from Pahoa	Number of Units	2	6	0	1
	Average Listing Price	\$60,000	\$47,325	\$ ----	\$90,000
	Average Age	3 years	3 years	----	2 years
	Average Main- Roofed Area	1,642 s.f.	1,302 s.f.	----	2,840 s.f.
Hawaiian Beaches/ Parks/Shores Subdivision  4 miles from Pahoa	Number of Units	3	27	5	0
	Average Listing Price	\$38,500	\$38,637	\$49,690	\$ ----
	Average Age	6 years	3 years	3-½ years	----
	Average Main- Roofed Area	1,067 s.f.	1,174 s.f.	1,840 s.f.	----
Nanawale Estates Subdivision  about 1 mile from Pahoa	Number of Units	5	12	0	0
	Average Listing Price	\$36,670	\$41,321	\$ ----	\$ ----
	Average Age	4 years	3 years	----	----
	Average Main- Roofed Area	1,071 s.f.	1,281 s.f.	----	----

The MLS Listing shows a great abundance of vacant, A-1a zoned lots to rebuild on with prices ranging from a low of \$4,100 to a high of \$22,000. Using a rough estimate of \$35 per square foot to construct a fairly decent dwelling, the cost to relocate to rebuild a 1,000 square-foot dwelling on these available lots will require from \$39,100 to \$57,000.

A limited number of rental units in the subdivision are advertised and have indicated rental rates of from \$225 - \$285 per month, with most being 3-bedroom units.

There is a possibility that all three residential displacees may be able to retain and relocate their existing improvements and/or rebuild on their remainder properties; however, any retention, relocation and/or rebuilding must be permitted and allowed under any and all applicable Federal, State and local statutes, ordinances and regulations governing buildings, land, land use and zoning.

Considering that the three (3) displacees, all residing at the outskirts of town, will be required to relocate from their properties, it is believed that the displacees will not encounter difficulties in obtaining replacement dwellings or sites in the nearby subdivisions and relocating thereto.

A difficulty which may present itself at the time of acquisition is that the cost to relocate to comparable, DSS dwelling will exceed the acquisition price and the replacement housing supplement. If this condition does come about, it can be remedied under the provisions of last resort housing, as later and generally explained under the last resort housing section.

Therefore, the selection of Alternate A does not appear to present relocation problems or problems, if any, that cannot be resolved.

Sub-Alternate A1:

This alternate involves the whole or partial-taking of twenty-three (23) parcels of land which are zoned and affected as follows:

P R O P E R T I E S   A F F E C T E D

APPARENT OCCUPANT AND IMPACT	Total No. Affected	Single Family Residential (RS)			Agricultural (A)					
		RS-10			A-1a			A-5a		
		# of Par- cels	Whole Take	Part Take	# of Par- cels	Whole Take	Part Take	# of Par- cels	Whole Take	Part Take
Parcels Affected	23	1	0	1	14	1	13	8	0	8
Residential Displacement	2	---	---	---	---	2	---	---	---	---
Agricultural Products Affected:										
Cane	8	---	---	---	2	---	2	6	---	6
Mac-Nut Farm	3	1	---	1	2	---	2	---	---	---

This alignment is anticipated to displace two (2) residences, presumed to be tenant-occupant families, on the near outskirts of the town.

The displacees will be required to relocate to the

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limited rental units available in the various subdivisions discussed in Alternate A. The presently available rental units are located about one mile or four (4) miles from their present dwellings with rental rates from \$225 - \$285 per month.

Inasmuch as rental and family income was not obtained, a determination on whether or not the displaced tenants can relocate to replacement dwellings within their financial means and within the limits of the rental replacement housing supplement cannot be accurately discussed. However, if monetary or housing problems are encountered at the time of relocation, last resort housing measures, as later explained, can be proposed and implemented to successfully relocate these displacees.

It is therefore not anticipated that selection of Sub-Alternate A1 will cause relocation problems that cannot be solved.

Alternate C:

General:

Alternate C is the central corridor following and "widening" approximately 1.3 miles of the existing Kaaau-Pahoa Road through the town of Pahoa. This alternate route, running from the near outskirts of the town to the Kaaau-Pahoa/Pahoa-Kapoho/Pahoa-Kalapana Roads junction and thereafter connecting to the Pahoa-Kalapana Road Improvement Project, will involve the taking of property along the southwestern-side (right side going towards Kapaho) of the existing road. Of all the corridors and alternates under consideration, this alternate has the greatest social and economic impacts by its affect and/or displacement of numerous persons, businesses and residences along the proposed alignment.

Impact:

This alternate route will involve the whole or partial-taking of 64 parcels of land which are zoned and affected as follows:

ZONING		PROPERTY TAKING		
		No. of Parcels	Whole Take	Partial Take
Single Family Residential (RS)	RS-10	18	0	18
	RS-15	17	0	17
Village Commercial (CV), CV-10		22	6	16
Agricultural (A)	A-1a	6	0	6
	A-5a	1	0	1
Total No. of Parcels Affected		64	6	58

The following list attempts to show the anticipated impact that Alternate C will have on the individuals, families, businesses, non-profit organizations and/or farms, if any, affected by this proposed alignment:

APPARENT OCCUPANTS AFFECTED BY CATEGORY	IMPACT	LEGEND
Residents	18*	* = Anticipated total impact (displacement resulting in relocation or discontinuance of residence/operation from present site of activity).
Rental Operations	1*	
Retail Trade	3*/3 $\phi$	$\phi$ = Anticipated partial impact (part of business operation affected) resulting in relocation of portion of business operation elsewhere on premises; presumed that business may still continue to operate on present site.
Services	1*	
Churches & Synagogues	1*	- = Displacement of advertising sign with costs covered by Appraisal Section.
Advertising Signs	4-	
Agricultural	1*	

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As shown in the above listing, Alternate C will displace 18 residences, 6 businesses (including the structure used for agricultural purposes), 1 church and 4 advertising signs and will partially affect the operations of 3 businesses. Of the 18 residences and 6 businesses displaced, 3 owner-occupants and 3 businesses could be combined and classed separately as 3 joint residential and business uses - Kawai's residence in a multi-business/residential building, a "mom-and-pop" store (Pahoa Cash & Carry) and the home/farm combination.

From all indications, it can be safely said that the majority of the individuals and families residing in the town are long-time established residents of this rural community. It is anticipated and foreseen that at least one-half, if not more, of the residential displacees will be elderly, many possibly retired, with low or fixed incomes. All others are anticipated to be in the low to moderate income brackets. Although rental rates for tenant-occupants were not obtained, it is believed that most would be low rent units, probably not exceeding \$200 per month.

It is anticipated that the successful relocation of all displaced individuals, families and businesses will be difficult to achieve because of the nonavailability of suitable replacement properties. There is a lack or scarcity of available, vacant or improved, residential and commercial properties, for sale or rent, in or near the town for the displacees to relocate to or rebuild on. This condition, coupled with and complicated by the numbers, income and age-levels of the displacees, does not indicate that an adequate relocation program can be assured or achieved.

Although an abundant amount of dwellings, predominately 3-bedroom units, and vacant lots are available in the various subdivisions listed and discussed in Alternate A, the location of these dwellings and sites are considered far-removed from all commercial, public and social facilities. Accessibility to these facilities, the separation from community and neighborhood ties, and the costs for the newer replacement housing may cause hardships for those displacees in the low-income group, and particularly for the elderly.

Inasmuch as rough estimates indicate that compensation for the property taking causing residential displacements range from a low of \$5,000 to \$20,000, the \$5,000 purchase replacement housing payment for State-funded or \$15,000 for Federal-aid projects may be insufficient to cover the costs to relocate to comparable replacement dwellings. Low-income individuals and families, particularly the elderly, may experience difficulties in obtaining financing for the construction or purchase of their replacement units.

There are only two (2) public housing projects in the area, both administered by the Hawaii Housing Authority. Nani O Puna, a 31-unit Puna Farm Labor project, located in Pahoa, has 7 units available at this time - two 2-bedroom units at \$111 per month and five 3-bedroom units at \$131. However, eligible applicants must be actively engaged in and obtain fifty percent (50%) of their family income from agricultural work.

The other public housing project is a low-income, elderly only project presently under construction and scheduled for occupancy in September, 1977. However, this project is located 11 miles from Pahoa in the town of Keaau. Thirty (30) units available are composed of 18 studios and 12 1-bedroom units and the monthly rental is based on twenty-five percent (25%) of the tenant's income.

The only problem anticipated for the displaced church will be in finding a suitable replacement space in the town area, where it is readily accessible to its members.

Indications are that the 3 displaced businesses (the multi-business/residential rental operation, Pahoa Cash & Carry Store and Toma Bakery & Restaurant) will discontinue their operations because of the lack of commercial buildings or sites to relocate to or rebuild on, the probable high costs to rebuild and reestablish, and the age of the business owners involved. Pahoa Cash & Carry is believed to have the best chances for continuing its operation, provided a suitable site is available and the attendant costs are not prohibitive.

It is anticipated that the selection of Alternate C will have a disruptive effect on the community, particularly for those being displaced, and will present relocation problems that will prove difficult to satisfactorily resolve. Most assuredly, a large-scale last resort housing plan is contemplated for the residential displacements resulting from this alignment.

The "Mauka" Corridor (Alternate E and Sub-Alternate E1):

General:

Alternate E and Sub-Alternate E1 are route locations within the corridor location that bypasses the town of Pahoa on its mauka (southwestern/mountain) side. These two (2) alternate routes are new route locations having common alignments running from the vicinity of the Kahakai Boulevard/Keaau-Pahoa Road intersection to the Pahoa-Kalapana Road. Each alternate continues towards Kalapana by connecting to the proposed Pahoa-Kalapana Road Improvement Project.

Alternate E:

This alternate route involves the partial-taking of 13 parcels of land which are zoned and affected as follows:

PROPERTIES AFFECTED				
AGRICULTURAL (A)				
APPARENT OCCUPANT AND IMPACT	Total No. Affected	A-1a No. of Parcels	A-5a No. of Parcels	A-20a No. of Parcels
Parcels Affected	13	9	3	1
Residential Displacement	1	1		
Crop (Cane) Damages	3	1	2	

Alternate E is anticipated to displace one owner-occupant family, whose 3-bedroom/2-bath dwelling appears to be of recent construction.

Preliminary indications are that the acquisition price, together with the maximum purchase replacement housing amount, will not exceed the costs to relocate to presently available replacement dwellings. On this basis, no relocation problems are presently anticipated, excepting the inconvenience of relocating to an area more distant from their present location.

Sub-Alternate E1:

This alternate route affects 14 parcels of agricultural-zoned lands involving the whole-taking of one A-1a zoned parcel and the partial-taking of 9 A-1a, 3 A-5a and 1 A-20a properties.

The only anticipated impact resulting from the selection of this alignment will be crop (cane) damages to three (3) parcels.

Pahoa-Kalapana Road Improvement Project:

This road improvement project is the proposed "widening" of 2.8 miles of the existing Pahoa-Kalapana Road in the Kalapana direction and will connect with all the other proposed road schemes.

The project involves the partial-taking of 12 agricultural zoned parcels of land. The only anticipated impact will be crop damages to one parcel.

Conclusion:

As presented by the foregoing discussion on each of the five (5) alternate routes and the road improvement project, all alternates will displace or affect individuals, families, businesses, a church and agricultural operations or activities in varying numbers with the exception of Sub-Alternate E1 and the Pahoa-Kalapana Road Improvement Project, which affects cane lands only.

Of all the road schemes, it is believed that Alternate C will have the greatest socio-economic impact because it will adversely affect the individuals, families and businesses to be displaced and to some degree will have a disruptive effect on the rural setting of the Pahoa

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community and the neighborhood affected. The general lack of residential and business properties in Pahoa or the near vicinity will require residential displacees to relocate to areas that are considered distant from and less accessible to the town and its commercial, public and social facilities. Further, relocation to the newer replacement housing may not be within the financial means of the displacees because many are considered to be in the low-income, low-rent and/or elderly.

It is therefore our recommendation that the central corridor, Alternate C, be eliminated from consideration because of the relocation problems that are anticipated and foreseen by its selection.

From a relocation standpoint only, Sub-Alternate E1 within the "mauka" corridor would be considered the most desirable alternate because no displacements are anticipated. Alternate E, within the same corridor, would also be acceptable because its lone residential displacement.

However, the selection of Alternate A or Sub-Alternate A1 within the "makai" corridor is not anticipated to present relocation problems, if any, that cannot be satisfactorily resolved. Of the two (2) alternate routes, a relocation assistance program for Sub-Alternate A1 would be considered the least difficult to administer and implement.

The indications provided by our study are applicable as of the present. Future surveys might indicate otherwise at such point in time.

When the project location is finally established, a relocation plan at the right-of-way stage will be prepared which will analyze in detail the characteristics and needs of the displacees, the inventory of available housing, the problems involved and their probable resolution.

#### Relocation Assistance:

All Federally-aided highway programs must comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The

State of Hawaii has appropriate enabling legislation and the State Department of Transportation also has an organization equipped and staffed to administer a relocation assistance program in accordance with the Federal and State laws.

A. Individuals and/or Families

An examination of the Federal law as well as the State program, which is described in the Relocation Advisory Assistance and Relocation Payments brochure attached herewith, reveals that certain statutory limits exist with respect to replacement housing payments that can be made to tenant- or owner-occupant displacees. Under the typical relocation assistance program, a displaced tenant will be eligible for up to a maximum of \$4,000 (\$1,500 for State-funded projects) which can be paid in lump sum or in annual installments at the discretion of the displacee. This maximum amount of \$4,000 in actuality, would be equivalent to a rental subsidy of \$83.33 per month over a period of four (4) years. In the case of an owner-occupant, a lump sum replacement housing payment, including increased interest and incidental expenses, of up to \$15,000 (\$5,000 for State projects) can be made to enable him to purchase a comparable decent, safe and sanitary replacement dwelling. These payments are in addition to moving payments and other services to which an eligible relocatee is entitled to receive.

The above benefit maximums sometimes are insufficient to accomplish the satisfactory relocation of individuals and/or families displaced by public projects because of the scarcity of rentals, the high cost to rent and the high cost of "for sale" homes in the designated project area. State and Federal regulations require that a displaced person must be relocated within his financial means. In other words, a tenant-occupant must be relocated so that the replacement housing unit to which he relocates will not increase his "out-of-pocket" costs in terms of rent, over and above the amount that he actually paid for his rent at the affected property, considering the additional payments received from his replacement housing payments.

The treatment of owner-occupants is similar to that of the tenant-occupant, although the payment is made on a lump sum basis to enable him to purchase a replacement housing unit comparable to that which he had previously occupied, and therefore, be no worse off financially in terms of housing costs than he was before.

On the basis of this conceptual relocation study, present indications are that the procedure called "Replacement Housing as Last Resort", Section 206(a), of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, may be required for certain alternate routes, if selected and as discussed in the main text. This situation will occur when the statutory requirements in providing the maximum replacement housing payments to satisfactorily relocate the displaced persons are exceeded. This increase in relocation payments beyond the maximums allowed is provided by law under Last Resort Housing. However, State law does not provide this action for State projects.

The various alternatives that can be utilized under Section 206(2) are:

1. Purchase of land and/or existing dwellings.
2. Rehabilitate existing dwellings.
3. Relocate and if necessary, refurbish or rehabilitate dwellings purchased by the State for right-of-way purposes.
4. Construct new dwellings.

All of these alternatives are accomplished under the auspices of the State highway agency and such housing can be either rented or sold to the displacee. It is our responsibility to provide the same ownership or tenancy status which the displacee had prior to his displacement. However, we are not obligated to provide a dwelling that will change the ownership or tenancy status of the relocatee unless such a replacement dwelling is available or can be provided more economically.

In addition, the replacement housing payment can be increased beyond the statutory limits to allow the displaced person - owner or tenant - to purchase or rent a dwelling beyond the maximum allowed, but within his financial means.

Federal and State procedures also have additional safeguards in the sense that construction cannot be authorized to begin on any project until such time that all displacees have been satisfactorily relocated to comparable decent, safe and sanitary housing within their financial means or that such housing is in place and has been made available to the relocatee.

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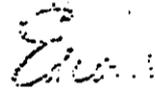
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B. Businesses, Farms and Non-Profit Organizations:

Our relocation assistance program contains no mandate to furnish comparable quarters, facilities or sites for displaced businesses, farms or non-profit organizations. Nevertheless, several elements of the State's assistance program for this type of relocatee are worthy of mention as follows:

1. Actual reasonable moving costs up to 50 miles will be paid.
2. Actual reasonable expenses in searching for a replacement business can be reimbursed.
3. In lieu of Items 1 and 2 above, a payment equal to the average annual net earnings of the business, not to exceed \$10,000 (\$5,000 for State projects), can be paid if the business is discontinued or cannot be relocated without a substantial loss of existing patronage.
4. Benefits of the small business disaster loan program under Section 7(b)(3) of the Small Business Act (15 U.S.C. 636(b)(3)) may be available to eligible small businesses suffering substantial economic injury as a result of its displacement by the highway project.

It is firmly believed that the selection of Alternate C will require the "in lieu of" moving cost payment program because the displaced businesses will be unable to reestablish their operations or in doing so, will incur substantial and prohibitive rental or replacement property costs.



EDWARD K. OCHIAI  
Head, Right-of-Way Branch

DKS:js

Enclosures

TABLE 1: POPULATION: HAWAII COUNTY, By District and Census Tract

DISTRICT AND CENSUS TRACT	1975 <sup>1/</sup>	Adjusted Pop. Est. <sup>2/</sup>	1974 <sup>3/</sup>	1970 Census <sup>4/</sup>
HAWAII COUNTY	74,700			63,468
Puna District (Census Tracts 210 and 211)	8,100	7,035	6,800	5,154
<u>Census Tract 210</u> (Keaau-Mt. View)		3,557		3,802
<u>Census Tract 211</u> (Pahoa-Kalapana)		3,478		1,352

<sup>1/</sup> State's estimated resident population as of 7/1/75.

<sup>2/</sup> OEO 1975 Census Update Survey, as of 4/1/75.

<sup>3/</sup> State's estimated resident population as of 7/1/74.

<sup>4/</sup> As of 4/1/70.

Source: Data Book, 1976, August 1976, County of Hawaii Department of Research & Development; OEO 1975 Census Update Survey, Hawaii County, September 1976, prepared by Hawaii County Economic Opportunity Council

TABLE 2: ETHNIC DISTRIBUTION: Census Tract 211 of the Puna District, 1970

ETHNIC STOCK	NO. OF PERSONS (% of Population)
Japanese	513 (37.9)
Filipino	302 (22.3)
Hawaiian	241 (17.8)
Caucasian	234 (17.3)
Chinese	55 (4.1)
Korean	7 (0.5)
Other	0 (0.0)

Source: Department of Planning and Economic Development's Community Profile - Population Characteristic Sheet, 1970 Census

TABLE 3: SELECTED POPULATION AND MANPOWER CHARACTERISTICS,  
Census Tract 211

	<u>Number (1975)</u>	<u>Percent Distribution (1975)</u>
<u>Population</u>		
Total	1,352 (3,478)	100.0
White	234	17.3
Non-White	1,118	82.7
Male	718	53.1
Female	634	46.9
<u>General Population Characteristics</u>		
Under 5 years of age	103	7.6
Under 18 years of age	436	32.2
65 years and over	212	15.7
Median Age	34.7	
Persons 14 years and over		
Married, male	310	55.9
Married, female	307	65.5
Number of Households	430 (1,039)	
Persons per Household	3.12 (3.51)	
Living in Group Quarters	12	0.9
Number of Families	325	
Husband and Wife	265	81.5
Other Male Head	40	12.3
Female Head	20	6.2
<u>Labor Force Status</u>		
Civilian Labor Force	419 (550)	100.0
Employed	407	97.1
Unemployed	12 (60)	2.9 (10.4)
Male	284	61.2
Female	135	39.7
<u>Population 16-21 years old, not in school, unemployed or not in labor force</u>		
	14	
<u>Class of Worker</u>		
Total Workers	407	100.0
Wage & Salaried	276	67.8
Government	62	15.2
Self-Employed	40	9.8
Unpaid Family Worker	29	7.2

TABLE 3: cont'd

	<u>Number (1975)</u>	<u>Percent Distribution (1975)</u>
<u>Industry</u>		
Total Workers	407	100.0
Construction	23	5.7
Manufacturing	33	8.1
Transportation	6	1.5
Comm. & Utilities	9	2.2
Wholesale Trade	34	8.4
Retail Trade	20	4.9
Finance, Ins. & Real Estate	16	3.9
Business & Repair Services	17	4.2
Personal Services	6	1.5
Health Services	-0-	-0-
Educational Services	40	9.8
Other Professional Services	12	2.9
Public Administration	11	2.7
Other Industries	180	44.2
<u>Occupation</u>		
Total Workers	407	100.0
Professional & Technical	36	8.8
Managerial & Administrative	28	6.9
Sales Workers	16	3.9
Clerical Workers	17	4.2
Craftsmen & Foremen	29	7.1
Operatives	57	14.0
Laborers, exc. farm	23	5.7
Farm Workers	178	43.7
Service Workers	23	5.7
Private Household Workers	-0-	-0-
<u>Income - 1969</u>		
Total Families	281	100.0
Median Family Income	\$7,603	
Families above \$25,000	-0-	-0-
Families between \$10,000 and \$25,000	99	35.2
Families below \$10,000	182	64.8
Families below Poverty Level	34	12.1
Families with Public Assistance Income	22	7.8
Unrelated Individuals	109	
Median Income	\$3,019	
Number below Poverty Level	39	35.8

TABLE 3: cont'd

	<u>Number (1975)</u>	<u>Percent Distribution (1975)</u>
<u>Housing</u>		
Total Housing Units	528	
One-Unit Structures	423	80.1
All-Occupied Units	430	
Owner-Occupied Units	308	71.6
Median Value, Owner-Occupied	\$19,200	
Median Rent, Renter-Occupied	\$0-30.00	

-----

Source: Hawaii County Data Book, 1976, August 1976, Department of Research & Development, County of Hawaii, Selected Manpower Indicators for the County of Hawaii, August 1976, Department of Labor & Industrial Relations, Research & Statistics Office; Community Profile-Population Characteristic, 1970 Census Sheet; Department of Planning & Economic Development; OEC 1975 Census Update Survey, Hawaii County, September 1976, Hawaii County Economic Opportunity Council.

APPENDIX J.

COMMENTS RECEIVED DURING THE DRAFT  
EIS REVIEW PERIOD

Copies of the correspondence received on the Draft EIS are provided in this Appendix. Dispositions to comments follow beginning on page J-26 through J-41. Pages J-42 through J-50 are copies of correspondence which did not necessitate replies.

PUNA SUGAR COMPANY, LIMITED

AN Amfac COMPANY

KEAAU, HAWAII 96749

February 2, 1978

Mr. Ralph T. Segawa  
Division Administrator  
U.S. Dept. of Transportation  
Federal Highway Administration  
Region Nine  
P.O. Box 50206  
Honolulu, Hawaii 96850

Dear Mr. Segawa:

Re: Hawaii RS-0130 (17), Draft Environmental Impact  
Statement, FHWA-HI-EIS-77-02-D, Keaau-Pahoa  
Road, Pahoa By-Pass

Thank you for the opportunity to review the above described  
Environmental Impact Statement.

**1A** Puna Sugar Co., Ltd. is definitely in favor of a makai by-  
pass road, i.e. alternate A or subalternate A-1. We would  
like to reiterate that the selection of any other route  
will not relieve the congested traffic situation in Pahoa  
Village since all Kapoho-Keaau traffic, including cane  
haul trucks, papaya trucks, and cinder hauling trucks would  
still be forced to travel through the Village.

Sincerely,



Charles T. Wallis  
Field Superintendent  
Puna Sugar Co., Ltd.

CTW/dkn

**HAWAIIAN TELEPHONE COMPANY**

P.O. BOX 425 • HILO, HAWAII 96720 • TELEPHONE 935-9411 • CABLE: TELHAWAII

February 21, 1978

U. S. Department of Transportation  
Federal Highway Administration, Region Nine  
P. O. Box 50206  
Honolulu, Hawaii 96850

Attention: Mr. Ralph T. Segawa, Division Administrator

Gentlemen:

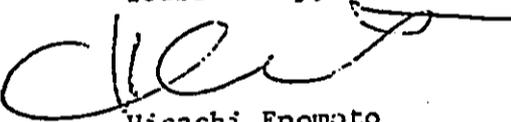
Subject: Draft EIS, Hawaii RS-0130(17), FHWA-HE-EIS-77-02-D, Keaau-Pahoa  
Road, Pahoa By-Pass. HEC-HI

This is to acknowledge receipt of the subject Draft EIS and to offer  
the following comments.

**2A** Alternate E will have the least effect on existing telephone poleline facilities.  
Alternate A and Subalternate A-1 could force the relocation of 1/2 mile and 3/4  
mile respectively of existing telephone poleline facilities along the Pahoa-  
Kalapana Road. Alternate C will force a major relocation of our facilities  
through Pahoa Town and along the Pahoa-Kalapana Road. Because of the magnitude  
of this poleline relocation and the need to use non-stock telephone cables  
which require order to delivery lead times ranging from six to eight months,  
we will require a minimum of 18 months to budget for, order material, engineer  
and complete the relocation.

Please send us a copy of the final EIS.

Yours truly,

  
Hisashi Enomoto  
Supervising Engineer

HE/pak

Conservation Council for Hawaii  
Hawaii Island Chapter  
453-C Waiianuenu Ave.  
Hilo, Hawaii 96720  
March 17, 1978

U. S. Department of Transportaion  
Federal Highways Administration  
Box 50206  
Honolulu, Hawaii 96850

Re: Hawaii RS-0130(17), Draft Environmental Impact Statement,  
FHWA-HI-EIS-77-02-D, Keaau-Pahoa Road, Pahoa By-Pass

HEC-HI

**3ABC**

The locations of any cemeteries, graveyards, rubbish dumps  
and large lava tubes in the proximity of alternate routes  
"A" and "E" would be helpful. Otherwise we are satisfied  
with the draft E. I. S.

Please send a copy of the final E. I. S.

Yours sincerely,

P. Quentin Tomich  
President

by *A. Jong*  
Environmental Chairman



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII

P. O. BOX 1820

HILO, HAWAII 96720

25 AUPUNI STREET

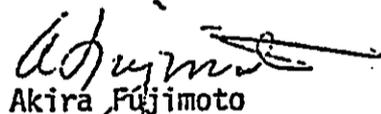
February 3, 1978

U. S. Department of Transportation  
Federal Highway Administration  
P. O. Box 50206  
Honolulu, HI 96850

KEAAU-PAHOA ROAD, PAHOA BY-PASS  
DRAFT ENVIRONMENTAL IMPACT STATEMENT

**4AB** Our concerns regarding the Pahoa deep wells were adequately incorporated into the subject document. However, we would like to comment further that some minor relocations of our existing facilities; such as, pipelines, fire hydrants, etc., may be required depending on which alternate route is selected and as to its design. This concern can be verified during the design stage of the project; at which time, submittal of construction plans for our review and approval will be appreciated.

Thank you for the opportunity to comment on the subject draft.

  
Akira Fujimoto  
Manager

QA

*... Water brings progress...*



# DEPARTMENT OF PUBLIC WORKS

COUNTY OF HAWAII - 25 AUPUNI STREET - HILO, HAWAII 96720 - TELEPHONE (808) 961-8321

HERBERT T. MATAYOSH  
Mayor  
EDWARD K. HARAOA  
Chief Engineer  
ARTHUR T. ISEMOTO  
Deputy Chief Engineer

February 9, 1978

Mr. Ralph T. Segawa  
Division Administrator  
Federal Highway Administration, Region 9  
U. S. Department of Transportation  
300 Ala Moana Blvd, Suite 4119  
P. O. Box 50206  
Honolulu, HI 96850

SUBJECT: HAWAII RS-0130(17), DRAFT ENVIRONMENTAL IMPACT STATEMENT,  
FHWA-EIS-77-02-D, KEAAU-PAHOA ROAD, PAHOA BY-PASS  
RE: Letter HEC-HI (1/27/78)

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

**5A** We had, by our July 4, 1977 comments on the E.I.S. preparation notice, expressed that the highway should not be the present alignment through the village (Alignment C).

**5B** As to the mauka and makai alternative routes we have the following comments.

#### Alternate A

Although displacement of 2 businesses and 3 residences will result, we feel this alignment is favorable in view of the travel time/cost adverse "backtracking" impact of Alternate E and the recommendation of the Puna Community Development Plan favoring the makai area being consistent with the future planned urban growth of Pahoa. The Community through the informational meeting appears to be supportive of the makai route. The fact that there will be removal of land for sugar cane cultivation Puna Sugar Company expresses acceptance of this fact by the EIS statement. As to Subalternate A-1, this route should be further studied as to its advantage on geometrics and noise factor by the alignment being further away from Pahoa School, which lessens the noise impact.

#### Alternate E

This alignment at first glance appears to serve the total by-pass concept by having the route away from Pahoa School and the Kaniahiku and Nanawale Estates subdivision. However, this concept would not be in consonance with the Puna Community Development Plan and the Community expression. Subalternate E-1 alignment should be further studied as to its geometric advantage over Alternate E. The travel time/cost factor caused by "backtracking" to get to the Pahoa Village and to Kapoho is a drawback on Alternate E.

Mr. Ralph T. Segawa

2

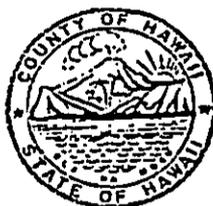
February 9, 1978

For the reasons stated above Alternate A, or Subalternate A-1 based on geometric, would be favorable over Alternate E or Subalternate E-1.



EDWARD HARADA  
Chief Engineer

cc: Mayor  
Planning Department



DEPARTMENT OF RESEARCH AND DEVELOPMENT  
COUNTY OF HAWAII • 25' AUPUN STREET • HILO, HAWAII 96720 • TELEPHONE (808) 961-8366

February 15, 1978

Mr. Ralph T. Segawa  
Division Administrator  
U. S. Department of Transportation  
Federal Highway Administration  
P. O. Box 50206  
Honolulu, Hawaii 96850

SUBJECT: Hawaii RS-0130(17), Draft Environmental Impact  
Statement, FHWA-HI-EIS-77-02-D, Keaau, Pahoa  
Road, Pahoa By-Pass

**6A** Thank you for this opportunity to review and comment on the  
abovementioned subject. We offer the following for your  
consideration.

1. The Population of the Puna District has shown appreciable increases since the last Census of Population (1970). Indicators of this increase in population are the increases in school enrollment, voter registration, and the level of residential construction activity.

Immediate past trends, anticipated economic and social activities point to continuous increases in population. The lower Puna area has numerous residential subdivisions of which most of the lots are still vacant and relatively inexpensive to purchase. The town of Pahoa has amenities such as the school, commercial, and social activities which are conducive to some further expansion. Also, the lower Puna area is within commuting distance of the City of Hilo, the major commercial, service, and population center of the east side of the Big Island of Hawaii.

2. The lower Puna area has recreational and cultural attractions which has and will continue to attract residents and visitors alike. The Isaac Hale Beach Park is the only area on the Puna coastline where commercial and pleasure boats can be launched. The Kaimu Beach-Harry K. Brown Park is famous for its black sand beaches and surfing areas. The MacKenzie State Park is well suited for passive

Mr. Ralph T. Segawa  
Division Administrator  
Page 2  
February 15, 1978

sightseeing and picnicking. The Hawaii Volcanoes National Park has a museum-cultural center at the Wahaula Heiau on the coastal road.

The attractions of the lower Puna area will continue to lure residents and visitors. Planned improvements to the Isaac Hale Beach Park (breakwater, launch ramp, and picnicking facilities), and the re-opening of the Chain of Craters-Kalapana Road by the National Park Service will add to the current level of traffic.

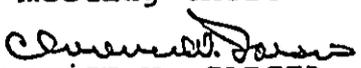
3. The Hawaii Geothermal Project well is located a few miles to the east of Pahoa town. Planned for this site is a power generation and research facility to test the feasibility of commercial exploitation of geothermal resources. Construction of the facility is expected to start during 1979.

Research activity relating to the well, the generating equipment, and environmental impacts will be continued up through 1983. Following the research phase of this project, the possibility exists for the establishment of an industrial park where the geothermal fluids would be used to generate electricity and also directly applied in food processing, etc.

4. The primary economic activity in the lower Puna area is related to agriculture (sugar, macadamia, flowers and foliage, and papayas). These agricultural commodities (with the exception of sugar) have shown favorable growth trends in recent years and its growth and further development is anticipated.

Due to current marketing conditions and the availability of suitable lands for these agricultural pursuits, ornamental horticulture will continue to be expanded upon in this area. The plans of a large papaya farming operation also calls for the continued expansion of their field planting operations.

As mentioned in the EIS document, the current roadway through the town of Pahoa is already taxed to its maximum. With the anticipated developments in population increases, business and commerce, and recreational activities, the present system will be far from adequate in meeting these needs.

  
CLARENCE W. GARCIA  
DIRECTOR



GEORGE R. ARIYUSHI  
GOVERNOR

CHARLES G. CLARK  
SUPERINTENDENT



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

OFFICE OF THE SUPERINTENDENT

February 15, 1978

Mr. Ralph T. Segawa  
Division Administration  
Region Nine  
Federal Highway Administration  
U.S. Department of Transportation  
Box 50206  
Honolulu, Hawaii 96850

Dear Mr. Segawa:

Subject: Hawaii RS-0130(17), Draft Environmental Impact  
Statement, FHWA-HI-EIS-77-02-D, Keaau-Pahoa  
Road, Pahoa By-Pass

After a careful review of the draft EIS for the Keaau-Pahoa  
Road, Pahoa Road By-Pass, we offer our department's comments.

**8A** Of the three (3) alternative alignments presented, the Department of Education favors Alternate Alignment "E". This alignment entirely by-passes Pahoa High and Elementary School which currently has an enrollment of over 1000 students and programmed to accommodate 1,300 students as the design enrollment. The total by-passing of the school would eliminate disturbing traffic noise that would be prevalent with such improved roadway. Alternate Alignment "E" would also minimize, to some degree, the potential traffic hazard which may result with an alignment closer to or within proximity of the school.

**8B** Alternate Alignments A and A-1 are recommended as our second choice for the Pahoa By-Pass with the road segment connecting to the Kalapana Road being aligned according to Sub-Alternate A-1. The consideration for Sub-Alternate A-1 connection to the Kalapana Road is of significant importance to Pahoa High and Elementary School as it is directed away from the school campus for the greater part. Negative factors of the A and A-1 alignments are their close proximity to the school campus and the possible problems that may arise at the intersection of Sub-Alternate A-1 to the Kalapana Road. It is within this proximity where the entire sports complex for Pahoa School has been planned with the major ingress and egress directed to the Kalapana Road.

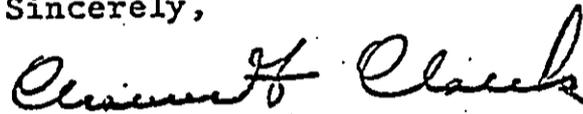
Mr. Ralph T. Segawa  
Page 2  
February 15, 1978

We appreciate your sending us the EIS for review and to respond.  
I look forward to our concerns being given consideration.

Please keep us informed as further development occur.

Aloha and mahalo.

Sincerely,



Charles G. Clark  
Superintendent

CGC:KM:HSW:jtm

RECEIVED  
FEB 16 1978  
U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
DENVER, COLORADO

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



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

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

FILE NO. \_\_\_\_\_

February 17, 1978

Mr. H. Kusumoto  
Federal Highways  
Room 4119, Box 50206  
300 Ala Moana Boulevard  
Honolulu, Hawaii 96850

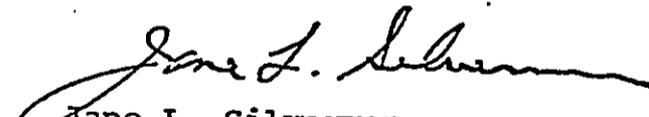
Dear Mr. Kusumoto:

Subject: Draft Environmental Impact Statement  
Keaau-Paho Road, Paho By-Pass,  
Hawaii Island

9A Information has not been presented relative to this office's letter of 12 October 1976. On the map returned were location marked in green where archaeological reconnaissance survey is recommended. It should be noted that no such survey, has been conducted to date. Should archaeological remains be encountered provisions will need to be made to insure their evaluation and proper mitigation.

This office concurs with your decision to eliminate alternative "C" as a viable route. Your consideration for historic preservation concerns is appreciated.

Sincerely yours,

  
Jane L. Silverman  
Historic Preservation Officer  
State of Hawaii



GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



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

February 21, 1978

GEORGE A. L. YUEN  
DIRECTOR OF HEALTH

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

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

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

In reply, please refer to:  
File: ~~EPHS-SS~~

MEMORANDUM

To: Mr. Ralph T. Segawa, Division Administrator  
Federal Highway Administration, U.S. Department of Transportation

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Keaau-Paho Road, Paho Road By-Pass Project No. RS - 130 (17)

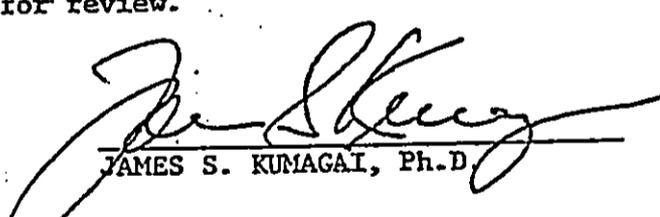
Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we have no objections to this project.

We submit the following comment for your consideration:

11A B

The air pollution analysis for carbon monoxide utilized emission factors from EPA's, "Compilation of Air Pollutant Emission Factors," Supplement 5, dated December 1975. The EIS should utilize the latest mobile source emission factors which were fully revised by EPA and released as an interim document in June 1977. To provide a more accurate carbon monoxide analysis, actual carbon monoxide measurements and corresponding traffic counts should be expanded and used in the determination of carbon monoxide concentrations at the receptor points.

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

  
JAMES S. KUMAGAI, Ph.D.

cc: Environmental Quality Commission  
State Department of Transportation

This Is Recycled Paper

J-15

GEORGE R. ARIYOSHI  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
DIVISION OF PUBLIC WORKS  
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI  
COMPTROLLER

MIKE N. TOKUNAGA  
DEPUTY COMPTROLLER

LETTER NO. (P) 1362.8

MAR 7 1978

U. S. Department of Transportation  
Federal Highway Administration  
Box 50206  
Honolulu, Hawaii 96850

Gentlemen:

Subject: Hawaii RS-0130(1/)  
Draft Environmental Impact Statement  
FHWA-HI-EIS-77-02-D  
Keaau-Pahoa Road, Pahoa By-Pass  
Ref: HEC-HI

We have reviewed the subject document and offer the following comments:

**12A** Page 46 - Predicted Future Noise Levels

If Alternative E is selected, the Hilo-Kalapana traffic will by-pass the school and the corresponding traffic should decrease along Kalapana Road adjacent to the school. Also, if Kaohe Homestead Road is connected to Alternative E, Kapoho residents may use Kaohe Road as a short cut to the new road.

If Alternative A is selected, the Kapoho-Kalapana traffic must still pass the school.

**12B** Page 57 - Alternative E

The "back-tracking" will result in additional noise to the school only if the "back-tracking" traffic is greater than the Hilo-Kalapana traffic which will by-pass the school.

The discussion on Alternative E should mention the probability of Kaohe Homestead Road connecting to the new

highway and providing a direct access to Pahoa Road. This would be undesirable to the school because of the potential hazards and noise on Kaohe Homestead Road which bisects the school.

**12C** Page 59 - By-Pass Design Alternatives

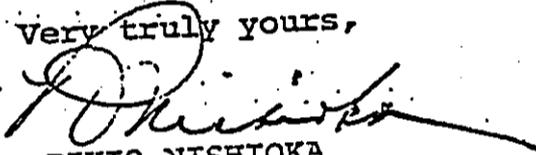
We favor sub-Alternate A-1 over Alternative A to minimize potential noise along Kalapana Road adjacent to the school.

**12D** Page C-9 - Pahoa High School

For Alternative E, the noise level along the school should increase only if the anticipated back-tracking Kapoho traffic is greater than the proposed by-passing of Hilo-Kalapana traffic. In Alternative A, the Kapoho-Kalapana traffic must still pass the school.

Thank you for the opportunity to review the subject EIS.

Very truly yours,

  
RIKIO NISHIOKA  
State Public Works Engineer

HS:jnt

cc: Mr. H. Hino  
Dr. K. Mizuba

GEORGE R. ARIYOSHI  
GOVERNOR



RECEIVED  
MAR 31 8 34 AM '78

DEPT. OF TRANSPORTATION  
LAND TRANSPORTATION  
FACILITIES DIVISION  
STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
OFFICE OF THE GOVERNOR  
550 HALEKALUWILA ST.  
ROOM 301  
HONOLULU, HAWAII 96813

RICHARD L. O'CONNELL  
DIRECTOR'S OFFICE

TELEPHONE NO.  
MAR 30 8 15 AM '78

DEPT. OF  
TRANSPORTATION

March 28, 1978

MEMORANDUM

TO: R. Higashionna, Ph.D, Acting Director  
Department of Transportation

FROM: Richard L. O'Connell, Director  
Office of Environmental Quality Control

SUBJECT: Environmental Impact Statement Keaau-pahoa Road,  
Pahoa By-pass, Project No. RS-130(17)

We have reviewed the subject document and offer the following comments for your consideration:

- 13A** 1) The cover should state that this eis is also being filed pursuant to Chapter 343, Hawaii Revised Statutes.
- 13B** 2) The assumptions underlying the projected ADT of 11, 490 for the year 2000 should be stated in the text. Are the population growth assumptions based on DPED's E-II projections? We note that these projections have recently been revised downward by DPED. What other routes might exist by the year 2000? What effect would these routes, if any, have on the proposed project?
- 13C** 3) We wish to point out that our Office and not the Environmental Quality Commission (page 4) reviews the revised eis and makes a recommendation of acceptance to the Governor. If the proposing agency desires, they can request the Commission to make a recommendation regarding the acceptability of the statement.
- 13D** 4) The Pahoa area lies five miles north, not east (page 14) of the Kilauea East Rift Zone.
- 13E** 5) The historical sites in Pahoa should be identified within the section on the existing socio-economic environment.

Mr. R. Higashionna  
Page 2  
March 28, 1978

- 13F 6) The proposed routes A and E should be shown on Figure 4 for easier analysis.
- 13G 7) By how much will the figure of 240 tourist related vehicles per day increase with the reopening of the Chain of Craters Road? Is this reflected in the projected figures?
- 13H 8) The placement of road signs before the by-pass stating available to tourists should help to mitigate the economic impact of the proposed project.
- 13I 9) There should be a listing of necessary approvals and their status in the eis.

The State EIS Regulations allow the accepting authority or his authorized representative to consider responses received after the fourteen day response period. This Office will exercise that option and will consider responses after the fourteen day period.

As of this date, we have received a total of five comments as indicated on the attached list.

For brevity and fairness, this Office did not attempt to summarize comments made by other reviewers. Instead, we strongly recommend that careful consideration be given to each comment made by the reviewers. We also recommend that a copy of the revised eis be provided to those persons and agencies that have provided substantive comments on the EIS.

We trust that our comments will be helpful to you in the preparation of the revised statement. Thank you for the opportunity to review this EIS.

Attachment

cc: Ralph T. Segawa, US DOT  
with attachment



DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
BUILDING 230  
FT. SHAFTER, HAWAII 96858

PODED-PV

13 February 1978

Mr. Ralph T. Segawa  
Division Administrator  
U. S. Dept of Transportation  
Federal Highway Administration  
300 Ala Moana Blvd, Suite 4119  
P. O. Box 50206  
Honolulu, Hawaii 96850

Dear Mr. Segawa:

We have reviewed the Draft Environmental Impact Statement for Keaau-Paho Road By-Pass (Proj. No. RS-130-17). It does not appear that Corps jurisdiction is involved in this project, although we are interested in the outcome due to our present involvement in the Hilo Bay Comprehensive Study. We find that the DEIS generally treats all of the significant topics, although discussion of impacts and the data base could be expanded in some areas. Our comments are as follows:

- 14A** 1. Pg. 27-28: The discussion of existing flora and fauna, and evaluation of impacts of route alternatives on these resources, appears to be based on limited field survey, but it is unclear who participated in this work and what methodology was used.
- 14B** 2. Pg. 31: There is some question whether the " cursory study " used to estimate numbers of tourists passing through Paho is adequate for assessment of socio-economic impacts.
- 14C** 3. Pg. 67: Clarify whether the statement "there are no known sites of historical or archaeological significance along Alternatives A & E", was based upon field studies of the project site. Use of the lands in question for pasture does not preclude the possibility that historical & archaeological sites may still exist along the alternative routes. Serious consideration should be given for a archaeological reconnaissance study, particularly in light of the fact that only a small and easily accessible amount of land is involved.

13 February 1978

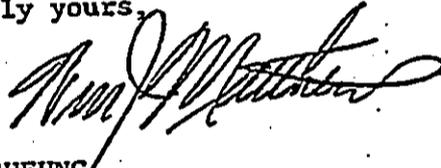
PODED-PV  
Mr. Ralph T. Segawa

14D

4. Suggest including expanded discussion of possible measures to mitigate anticipated impacts of various alternatives in your revised EIS. For example, what can be done to maintain ease of access in and out of Pahoa town if other routes are chosen? This is particularly important in light of the recognized historical significance of the town buildings and the economic impacts of the out-of-town alternatives on businesses in Pahoa.

Thank you for the opportunity to comment on the DEIS.

Sincerely yours,



*for*  
KISUK CHEUNG  
Chief, Engineering Division



UNITED STATES  
DEPARTMENT OF THE INTERIOR

OFFICE OF THE SECRETARY

PACIFIC SOUTHWEST REGION

BOX 38098 • 450 GOLDEN GATE AVENUE

SAN FRANCISCO, CALIFORNIA 94102

(415) 556-8200

ER-78/72

March 13, 1978

Mr. Ralph T. Segawa  
Division Administrator  
U.S. Department of Transportation  
Federal Highway Administration  
300 Ala Moana Blvd., Suite 4119  
Post Office Box 50206  
Honolulu, Hawaii 96850

Dear Mr. Segawa:

The Department of the Interior has received and reviewed the draft environmental impact statement for the proposed by-pass construction of a portion of the Keaau-Pahoia Road (FAS Route 130). We submit the following comments for your consideration in further evaluating the potential impacts of the proposal.

**15 A** Alternative "E" is located in very close proximity to the Pahoia Deep Wells, which are the source of the potable water supply for the area. The possibility that the proximity of the road construction and subsequent drainage may affect the quality of the waters withdrawn should be addressed in detail. We do not anticipate any significant or adverse effect on the quality and quantity of the ground water resources underlying or in proximity to project alternatives "A" and "C". Alternative "A" should have about the same nominal effect on the ground water resources as the existing road alignment.

Storm drainage and erosion control during and after construction of the proposed highway are satisfactorily discussed. We foresee no significant effect on the quality of surface and near shore waters provided the design measures necessary to protect water quality are carried out.

**15 B** According to the letter received from the State Historic Preservation Officer (Appendix F), locations in the project area previously undisturbed by cultivation or the land alterations should be intensively surveyed for archeological resources. Since the map referred to is not included in

the draft statement, we are unable to determine if any of the undisturbed areas would be affected by implementation of either Alternative "A" or Alternative "E". This issue should be clarified by including the referenced map in the final statement, showing areas previously disturbed or altered. A letter from the State Historic Preservation Officer, documenting the absence of cultural resources could also be used. If the proposed rights-of-way for Alternatives "A" and "E" have not been previously disturbed or altered, then a qualified archeologist should be contacted to conduct an intensive cultural resource survey.

15C This same letter (Appendix F), indicates that the Pahoa Historic and Commercial District is located within project area and not the converse (page 67).

We appreciate the opportunity to review the draft environmental statement.

Sincerely yours,



Patricia Sanderson Port  
Regional Environmental Officer

cc: Director, OEPR (w/c inc.)  
Director, HCRS  
Director, FWS  
Director, NPS  
Director, USGS  
Reg. Dir. HCRS  
Reg. Dir. FWS  
Reg. Dir. NPS  
Reg. Dir. USGS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 REGION IX  
 215 Fremont Street  
 San Francisco, Ca. 94105

RECD:				
APR 26 1978				
HRA				
HRS				
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Project # D-FHW-K40057-HI

F. E. Hawley, Regional Administrator  
 Federal Highway Administration  
 2 Embarcadero, Suite 530  
 San Francisco CA 94101

APR 25 1978

Dear Mr. Hawley:

The Environmental Protection Agency has received and reviewed the draft environmental statement for Keaau-Pahoa Road, Pahoa Road by-pass Project # RS-130 (17), Pahoa Village on the Island of Hawaii.

EPA's comments on the draft environmental statement have been classified as Category LO-1. Definitions of the categories are provided in the enclosure. The classification and the date of EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act. Our procedure is to categorize our comments on both environmental consequences of the proposed action and the adequacy of the environmental statement.

**16A** We have one question on the air quality section. When the Vehicle Miles Traveled (VMT) was calculated for inclusion in Table 6 (page 39), why was a 2-mile route length used? The project length was described as 4.4 miles long on page 6. This discrepancy should be clarified in the final statement.

EPA appreciates the opportunity to comment on this draft environmental statement and requests three copies of the final environmental statement when available.

-2-

If you have any questions regarding our comments, please contact Betty Jankus, Environmental Impact Statement Coordinator at (415)556-6695.

Sincerely,

*David L. Calkins*

David L. Calkins, Director  
Office of External Relations

Enclosure.



EVALUATION

HAWAIIAN TELEPHONE COMPANY

- 2A. The information provided regarding Alternates A, C, and E has been incorporated into the Final EIS. Subalternate A-1 is being recommended for further development. The Hawaiian Telephone Company will be contacted during the design phase to coordinate plans for the roadway with the facilities of the telephone company.

EVALUATION  
CONSERVATION COUNCIL FOR HAWAII

- 3A. The location of one of the cemeteries in the Pahoa Village area is shown on Figure 2, page 8 of the Draft EIS. Smaller cemeteries exist in the Village or outlying area south (mauka) of the Village. Because no cemeteries would be affected, their location was not included in the EIS.
- 3B. A sanitary landfill is located just outside of the project boundaries northwest of Pahoa Village (on the mauka side of the Keaau-Pahoa Road).
- 3C. There are no known large lava tubes in the proximity of the alternative routes.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

EVALUATION  
DEPARTMENT OF WATER SUPPLY  
COUNTY OF HAWAII

- 4A. The comments of the Department of Water Supply will be included in the Final Environmental Impact Statement as follows:

"During the Draft EIS review period, the Department of Water Supply, County of Hawaii (February 3, 1978) commented that the proposed bypass will cause minor relocations of their existing facilities (e.g. pipelines, fire hydrants) depending on which alternate route is selected and its design. Therefore, construction plans for the relocation of facilities will be submitted to their Department for approval."

- 4B. As requested, construction plans will be provided to the Department of Water Supply for review and approval during the design phase.

EVALUATION  
DEPARTMENT OF PUBLIC WORKS  
COUNTY OF HAWAII

- 5A. Alternate C, the alignment through Pahoa Town, has been eliminated from further consideration since this alternative would have a significant and adverse impact. The reasons for deletion on C were stated in the Draft EIS in Section V, F., page 60.
- 5B. Subalternate A-1, a modification of Alternate A, is being recommended for further development. Alternate A had the following significant advantages over Alternate E.
- a. Elimination of cane haul trucks from the road through Pahoa Town.
  - b. A more direct route toward Kapoho.
  - c. No potential for adverse impact on the Pahoa Deep Wells.
  - d. A higher benefit/cost ratio.
  - e. Greater community support.

Subalternate A-1 was recommended instead of Alternate A because:

1. It provides a smoother transition to the existing road.
2. It is more favorable to Pahoa School in terms of traffic noise and safety.

EVALUATION  
DEPARTMENT OF RESEARCH AND DEVELOPMENT  
COUNTY OF HAWAII

- 6A. The information provided in items 1 through 4 has been incorporated into the Final EIS document.



EVALUATION  
DEPARTMENT OF EDUCATION  
STATE OF HAWAII

- 8A. Alternate E, although bypassing Pahoa High and Elementary School, will result in some traffic hazard and create as much or more noise than Alternates A and A-1. This is because vehicles whose destinations are Kapoho will either continue to utilize the existing Pahoa Road or will have to "back-track" from the bypass in order to continue on to Kapoho. Alternates A and A-1 will not have this "back-tracking" aspect.
- 8B. Alternate A-1 has been recommended for further development. It should be emphasized that this is only a corridor selection and that the final alignment will be determined during the design phase of this project. The design of the roadway will be coordinated with the Department of Education in order to avoid any significant adverse impacts on the school and its facilities.

EVALUATION  
HISTORIC PRESERVATION OFFICER  
DEPARTMENT OF LAND AND NATURAL RESOURCES

- 9A. The section on historical/archaeological sites (page 67 of the Draft EIS) will be revised to read (in part):

"The October 12, 1976 letter (see page F-1) from the SHPO transmitted a map showing locations where potential historical/archaeological sites may be present.

"Based on a review of the map and in comparison to the recommended Alternative A-1, it was found that portions (less than 10 percent) of the proposed alignment is within the area in which an archaeological walk through survey (initial field visit to determine the possible existence of historical/archaeological sites) was recommended by SHPO. For these areas, an archaeological walk through survey will be conducted and the results provided to SHPO."

A map showing these areas will be included in the Final EIS.

This aspect of the proposed project will be further coordinated with the Historic Preservation Officer.

EVALUATION

DEPARTMENT OF LAND AND NATURAL RESOURCES

- 10A. Alternate A-1 is being recommended for further development. One of the reasons for the selection of Alternate A-1 is that it will not adversely affect the Pahoa Deep Wells through future encroachment and contamination. This recommendation seems consistent with the concern of the Department of Land and Natural Resources.

EVALUATION  
DEPARTMENT OF HEALTH

- 11A. Specifically, the concerns of the Department of Health included the need to utilize the latest mobile source emission factors which were revised by EPA and released as an interim document in June, 1977. Also, it was suggested that the air pollution impact study include actual carbon monoxide measurements and corresponding traffic counts to determine carbon monoxide concentrations at the receptor points. In responding to these concerns, the air pollution consultant, Mr. Barry Root, noted: (1) the study was conducted in May, 1977 when the interim document was not yet available; (2) the interim document was not distributed or available locally until January of this year; and (3) a review of the new emission factors indicates that although the estimated emissions would change, the change would not alter the air pollution study's conclusion.
- 11B. In response to the suggestion that actual carbon monoxide measurements and corresponding traffic counts be taken, such measurements would add information on the existing ambient air quality but would not significantly change the results of the air quality analysis. Please note that the equipment for measuring carbon monoxide is not presently available on the island of Hawaii and that the expenses required to provide such data and equipment would prove to be costly.

EVALUATION

DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

12A. Page 46 - Predicted Future Noise Levels

Connector roads to the proposed bypass road will be the responsibility of the County of Hawaii. However, plans for connector roads has not yet been developed by the County. Subalternate A-1 is being recommended for further development. The Kapoho-Kalapana traffic will continue to pass the Pahoa High and Elementary School but at a distance farther than the present roadway.

12B. Page 57 - Alternative E

The number of cars whose destination is Kapoho or in that direction is relatively significant so that "back-tracking" is expected to be a problem (e.g. noise, traffic safety). Alternate E has been eliminated from further consideration.

12C. Page 59 - Bypass Design Alternatives

No response necessary.

12D. Page C-9 - Pahoa High School

This comment is addressed in items 1 and 2 above.

In addition, the design of the proposed roadway will be coordinated with the Department of Accounting and General Services in order to avoid any significant adverse impacts on the school and its facilities.

## EVALUATION

### OFFICE OF ENVIRONMENTAL QUALITY CONTROL

- 13A. Because of Federal requirements, the cover must remain as is; however, page 3 will be revised to state that: "This EIS is also being prepared for the State's requirement for an EIS."
- 13B. Population growth projections were not directly used in projecting the ADT for future years. The primary reason for this is that much of the traffic in the area is generated by tourists passing through. A population projection alone would grossly underestimate traffic along this road. Instead, the estimated ADT is based on the historical increase in traffic data. No other primary routes through this area is planned.
- 13C. To correct the discussion on the State's EIS procedure, page 4 will be revised (in part) to read: "The document is then finalized and provided to the State Office of Environmental Quality Control for their recommendation of approval to the Governor. The Governor then accepts the Final EIS."
- 13D. The sentence on page 14 has been revised to correctly read: "The Pahoa area is located approximately 5 miles north of the Kilauea East Rift Zone."
- 13E. It is felt that the present format provides the necessary information on the historical/archaeological sites. Appendix F provides additional detail on the description and location of these sites.
- 13F. The alignments for Alternates A and E can be cross-referenced from either Figure 2 or Exhibit 1.
- 13G. The basic assumptions used in the traffic assignment are identified on page B-23 of the EIS. As stated, "Chain of Craters Road assumed to be reconstructed by 1980, enabling circuitous tourist trips."
- 13H. It is anticipated that road signs will indicate to travelers the location and distance of Pahoa Village from the bypass.
- 13I. A listing of necessary approvals will be included in the Final EIS.

## EVALUATION

### U.S. DEPARTMENT OF THE ARMY

- 14A. Discussion on existing flora and fauna was based on limited field surveys. Observations of the flora and fauna were based on conversations with the District Engineer's office, the archaeological survey team, and site visits by the EIS consultant team.
- 14B. The counting of tourist cars passing through Pahoia as indicated on page 31 was done by a socio-economic consultant. This survey was used to estimate the number of tourists passing through the area and was felt to be adequate for the purposes of assessing the socio-economic impacts.
- 14C. The State Historic Preservation Office in a letter dated October 12, 1976, indicated that there is a potential for historical/archaeological sites in certain outlying sites around Pahoia. A map was included with the letter indicating those areas in which potential historical/archaeological sites may exist. Based on a review of this map, and in comparison to the recommended Alternative A-1, it was found that portions (less than 10 percent) of the proposed alignment is within the area where an archaeological reconnaissance was recommended by the State Historic Preservation Office. For these areas, an archaeological walk-through survey will be conducted and the results provided to the State Historic Preservation Office for further coordination.
- 14D. Connector roads will be the responsibility of the County of Hawaii and is not in the scope of this highway improvement. The State will coordinate with the County of Hawaii on any plans they may have for the connector roads.

EVALUATION

U.S. DEPARTMENT OF THE INTERIOR

- 15A. Alternate "E": impact on Pahoia Deep Wells. Subalternate A-1 is being recommended for further development. One of the reasons for recommending this alignment is that it is not likely to affect the Pahoia Deep Wells.
- 15B. Historical/archaeological concerns. The section discussing historical and archaeological sites has been revised (in part) to read:

"The October 12, 1976 letter (see page F-1) from the SHPO indicated that there is a potential for historical/archaeological sites in certain areas around Pahoia. Based on a review of this map and in comparison to the recommended Alternate A-1, it was found that portions (less than 10 percent) of the proposed alignment is within the area in which an archaeological walk-through survey (initial field visit to determine the possible existence of historical/archaeological sites) was recommended by SHPO. For these areas, an archaeological walk-through survey will be conducted and the results provided to SHPO."

As indicated, a qualified archaeologist will be retained to conduct this archaeological reconnaissance.

- 15C. Pahoia Historic and Commercial District. The statement has been deleted.

The recommended Alternate A-1 will have no impact on the Pahoia Historic and Commercial District.

EVALUATION

U.S. ENVIRONMENTAL PROTECTION AGENCY

16A. In response to the question on Vehicle Miles Traveled (VMT), two miles were used (versus the 4.4 miles for the total project) because only the route through or bypassing Pahoa Town will affect the traffic assignment. The remaining 2+ miles of improvement will consist of upgrading the existing 2-lane roadway to present day design standards.

STEPHEN K. YAMASHIRO  
Chairman & Presiding Officer

JOSEPH R. GARCIA, JR.  
Vice Chairman



COUNTY COUNCIL  
COUNTY OF HAWAII  
HAWAII COUNTY BUILDING  
HILO, HAWAII 96720

JAMES L. K. DAHLBERG  
TAKASHI DOMINGO  
TOMIO FUJII  
WILLIAM S. KAWAHARA  
MERLE K. LAI  
MUNEO SAMESHIMA  
HARVEY S. TAJIRI  
Council Members

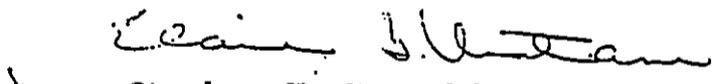
February 2, 1978

Mr. Ralph T. Segawa  
Division Administrator  
U.S. Dept. of Transportation  
Federal Highway Administration  
P. O. Box 50206  
Honolulu, Hawaii 96805

RE: FHWA-HI-EIS-77-02D, Keaau-Paho Road,  
Paho By-Pass

This will acknowledge receipt of the Draft  
Environmental Impact Statement for the above  
project and to inform you that I have forwarded  
it to the Council's Committee on Public Works  
for study and recommendation.

As soon as the Hawaii County Council acts on  
this matter, you will be notified.

  
for Stephen K. Yamashiro  
COUNCIL CHAIRMAN

GEORGE R. ARIYOSHI  
GOVERNOR



VALENTINE A. SIEFERMANN  
MAJOR GENERAL  
ADJUTANT GENERAL

STATE OF HAWAII  
DEPARTMENT OF DEFENSE  
OFFICE OF THE ADJUTANT GENERAL  
~~FORT RUGER, HONOLULU, HAWAII 96816~~  
3949 Diamond Head Road, Honolulu, Hawaii 96816

HIENG

7 FEB 1978

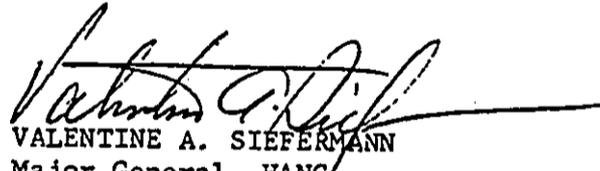
Mr. Ralph T. Segawa  
Division Administrator  
U.S. Department of Transportation  
Federal Highway Administration  
Box 50206  
Honolulu, Hawaii 96850

Dear Mr. Segawa:

Hawaii RS-0130 (17), Draft Environmental Impact  
Statement, FHWA-HI-EIS-77-02-D, Keaau-Pahoa  
Road, Pahoa By-Pass

Thank you for your letter of January 27, 1978 regarding the above subject.  
We have no comments to offer on this project at this time.

Yours truly,

  
VALENTINE A. SIEFERMANN  
Major General, HANG  
Adjutant General

GEORGE R. ARIYOSHI  
GOVERNOR



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

February 7, 1978

FRANKLIN Y. K. SUNN  
EXECUTIVE DIRECTOR

WILLIAM A. HALL  
ASSISTANT EXEC. DIRECTOR

IN REPLY REFER

TO: 0-158.1/307

U. S. Department of Transportation  
Federal Highway Administration  
300 Ala Moana Blvd., Suite 4119  
Box 50206  
Honolulu, Hawaii 96850

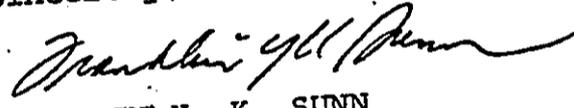
Gentlemen:

Subject: Hawaii RS 0130(17), Draft Environmental  
Impact Statement, FHWA-HI-EIS-77-02-D  
Keaau-Paho Road, Paho By-Pass

Thank you for allowing the Hawaii Housing Authority to  
comment on the above referenced draft environmental impact  
statement. We have reviewed the above draft and have no  
negative comments to the proposed action.

Should you have any questions, please refer them to Rex  
Johnson at 848-3211.

Sincerely,

  
FRANKLIN Y. K. SUNN  
Executive Director

cc: R. Lin-DSSH

HAWAII ELECTRIC LIGHT COMPANY, INC.  
P. O. BOX 1027 HILO, HAWAII-96720



78-21-2A

February 21, 1978

U.S. Department of Transportation  
Federal Highway Administration  
Box 50206  
Honolulu, Hawaii 96850

Attention: Mr. H. Kusumoto  
Assistant Division Administrator

Subject: Hawaii RS-0130(17), Draft Environmental  
Impact Statement, FHWA-HI-EIS-77-02-D,  
Keaau-Pahoa Road, Pahoa By-Pass

Gentlemen:

Thank you for sending us the booklet for the above  
subject project. Please refer to our letter of May 3,  
1977. We have no further comments.

Very truly yours,

Jitsuo Niwao, Manager  
Engineering Department

JN:bk

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

---

P. O. Box 50004, Honolulu, HI 96850

February 21, 1978

Mr. Ralph T. Segawa  
Division Administrator  
Federal Highway Administration  
Region Nine  
P. O. Box 50206  
Honolulu, Hawaii 96850

Dear Mr. Segawa:

Subject: Hawaii RS-0130(17), Draft Environmental Impact Statement,  
FHWA-HI-EIS-77-02-D, Keaau-Pahoa Road, Pahoa By-Pass

We have reviewed the above draft environmental impact statement and have no comments to offer. We request a copy of the Final EIS be sent to us.

Thank you for the opportunity to review this document.

Sincerely,

*Harry M. Man* Acting

Jack P. Kanalz  
State Conservationist





ANDREW I. T. CHANG  
DIRECTOR OF SOCIAL SERVICES & HOUSING

STATE OF HAWAII  
DEPARTMENT OF SOCIAL SERVICES AND HOUSING  
P. O. Box 339  
Honolulu, Hawaii 96809

February 23, 1978

U. S. Department of Transportation  
Federal Highway Administration  
Box 50206  
Honolulu, Hawaii 96850

Attn: H. Kusumoto, Assistant Division Administrator

Subject: Hawaii RS-0130(17), Draft Environmental Impact  
Statement, FHWA-HI-EIS-77-02-D, Keaau-Paho  
Road, Paho By-Pass

Subject EIS has been reviewed for its impact on departmental programs.

We have no comment to make and we are returning the EIS for your usage.

Thank you for the opportunity to review and comment.

Please direct future EIS' to Benjamin Y. P. Fong, our departmental liaison  
person.

Sincerely,

ANDREW I. T. CHANG  
Director

Attachment



REGION IX  
450 Golden Gate Avenue  
P.O. Box 36003  
San Francisco, California 94102

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
AREA OFFICE

300 ALA MOANA BLVD., RM. 3318, P. O. BOX 50007  
HONOLULU, HAWAII 96850

March 13, 1978

IN REPLY REFER TO:

9.7SC (JOHNSON/546-  
5554)

Mr. Ralph T. Segawa  
Division Administrator  
U.S. Department of Transportation  
Federal Highway Administration  
Box 50206  
Honolulu, Hawaii 96850

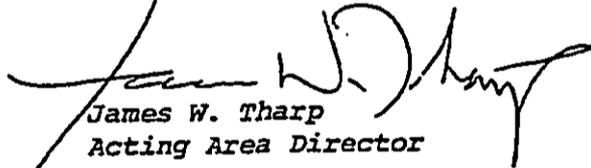
Dear Mr. Segawa:

Subject: Hawaii R S-0130(17) Draft Environmental Impact Statement  
FHWA-HI-EIS-77-02-D, Keaau-Pahoa Road, Pahoa By-Pass

The Draft EIS for the subject project was reviewed for HUD concerns. Proposed alternative A will reduce traffic congestion in Pahoa, reduce noise to acceptable levels on residential properties and has greater community support than the other alternatives.

We look forward to receiving a copy of the Final EIS.

Sincerely,

  
James W. Tharp  
Acting Area Director



DEPARTMENT OF PLANNING  
AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI  
Governor

HIDETO KONO  
Director

FRANK SKRIVANEK  
Deputy Director

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

March 22, 1978

Ref. No. 6032

Mr. Ralph T. Segawa  
Division Administrator  
U.S. Department of Transportation  
Federal Highway Administration,  
Region Nine  
P.O. Box 50206  
Honolulu, Hawaii 96850

Dear Mr. Segawa:

Subject: Hawaii RS-0130(17), Draft Environmental Impact  
Statement, FHWA-HI-EIS-77-02-D, Keaau-Pahoa Road,  
Pahoa By-Pass

We have reviewed the subject draft environmental impact statement and have found it to be reasonably adequate in its consideration of probable environmental impacts associated with the proposed action.

While we have no additional comments to offer, we do appreciate your soliciting our input on this matter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Hideto Kono".

HIDETO KONO



DEPARTMENT OF PARKS & RECREATION  
COUNTY OF HAWAII

Herbert Matayoshi, Mayor  
Milton Hakoda, Director

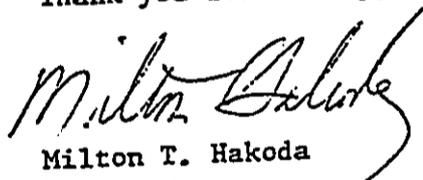
March 29, 1978

U.S. Department of Transportation  
Federal Highway Administration  
Region Nine  
300 Ala Moana Blvd., Suite 4119  
Box 50206  
Honolulu, Hawaii 96850

Subject: Keaau-Pahoa Road, Pahoa By-Pass  
Draft Environmental Impact Statement

We have no adverse comments to offer on the draft statement.

Thank you for the opportunity to review the report.

  
Milton T. Hakoda  
Director

APPENDIX K

BENEFIT/COST RATIO

<u>Corridor</u>	<u>Preliminary Engineering</u>	<u>Right of Way Cost</u>	<u>Construction Cost</u>	<u>Road Users Cost*</u>	<u>Difference in Total Annual Cost</u>	<u>Benefit/Cost Ratio</u>
Alternative "A"	457,300	482,150	3,048,500	1,875,600	317,720	1.53
Subalternative "A <sub>1</sub> "	476,000	430,450	3,173,800	1,875,600	325,710	1.49
Alternative "C"	544,800	1,136,450	3,632,100	2,104,500	415,070	0.62
Alternative "E"	483,800	290,800	3,225,600	2,028,000	319,230	1.04
Subalternative "E <sub>1</sub> "	473,000	196,650	3,153,200	2,028,000	306,820	1.08

\* Road Uses Cost for basic existing conditions - \$2,360,000.00

1. Interest Rate = 7%

2. Life of Improvements:

<u>Item</u>	<u>Term (Years)</u>
A.C. Pavement . . . . .	20
Right of Way . . . . .	60
Grading, Drainage, Structures . . . . .	40

3. Roadway Maintenance:

- a. \$2,000/mile for existing roads
- b. \$1,800/mile for new roads

Source: Park Engineering, Inc.

APPENDIX L

KEAAU-PAHOA ROAD  
PAHOA BYPASS  
PROJECT NO. RS-130(7)  
PUBLIC HEARING SUMMARY

A corridor Public Hearing was held on March 16, 1978 in Pahoa, Hawaii. The following is a summary and evaluation of the testimonies, both oral and written, which were received:

COMMENTS

EVALUATION

A. Mr. Mituso Ogata (resident and property owner): Mr. Ogata is concerned about the impact of Subalternative A-1 on his property and requests that the alignment be moved toward Pahoa School.

A. This request will be considered during design and every effort will be made to minimize any adverse impact on Mr. Ogata's property.

B. Mr. Peter Hauanio: Same request as A, above.

B. Same evaluation as A, above.

C. Mr. John Farias, Jr. (Chairman, Board of Agriculture): Alternatives A and A-1 pass directly through the State's first and only Agricultural Park. Board of Agriculture prefers that these alternatives not be used.

C. We appreciate Mr. Farias's concern; however, it should be noted that other agricultural lands would be affected if the mauka alternatives (E and E1) were implemented. After detailed evaluation, we have selected Alternative A-1. The final alignment will be determined during design and every effort will be made to minimize any adverse impact on the Agricultural Park.

D. Mr. Keiji Kobayashi (resident and property owner):

D.

1. Mr. Kobayashi is concerned about the impact of Alternatives A and A-1 on his property and improvements.

1. Every effort will be made during design to minimize any adverse impact.

2. Mr. Kobayashi believes that when an existing roadway is being widened, an equal amount of land should be taken from both sides of the road.

2. If all factors are about equal, we agree that an equal amount of land should be taken from both sides of the existing roadway. Unfortunately, these factors are usually not equal, and therefore, the acquisition must be accomplished to minimize adverse impacts.

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| E. | Mr. Raymond Hayashi (resident and property owner):<br>Mr. Hayashi is concerned about the impact of Subalternative A-1 on his property and improvements, and requests that the alignment be moved makai.   | E. | This request will be considered during design and every effort will be made to minimize any adverse impact.  |
| F. | Mr. Sidney Fuke and Mr. Norman Hayashi (County Planning Department):<br><br>1. The County General Plan does not make reference to a bypass road.<br><br>2. The Puna Community Development Plan is still a draft, thus, has not been officially accepted by the County.                        | F. | 1. We concur with this statement, however, we wish to add that the alternatives are complementary to the goals, policies and applicable standards of the General Plan Transportation element.<br><br>2. This fact was considered in the route selection. |
| G. | Mr. Sidney Fuke (Director, County Planning Department):<br>"... and suggest that consideration be given to that identified as Subalternative A-1." Mr. Fuke also suggests that, if possible, "the alignment be shifted in order that relocation of any structure or resident need not occur." | G. | Subalternative A-1 is the selected alignment. Mr. Fuke's other suggestion will be considered during design and every effort will be made to minimize impact on structures and residents.   |
| H. | Mr. Norman Hayashi: Mr. Hayashi believes that Alternative C was prematurely dropped.  | H. | We evaluated the advantages and disadvantages of Alternative C, as well as its social, economic, and environmental impacts. We then concluded that Alternative C is not a viable solution to the existing traffic problems in Pahoa Town.                |

I. Mrs. Sarah Hauanio (President, Big Island Papaya Growers Association): The Big Island Papaya Growers Association supports Subalternative A-1.

J. Mr. Raymond Smythe (Resident, of Leilani and President of Puna Credit Union):

1. Mr. Smythe believes that the Puna Community Development Plan should be adopted before a bypass alignment is selected.

2. Mr. Smythe takes issue with the following statements in the Environmental Impact Statement (EIS):

- a. "According to comments by business leaders in the Pahoia Community, residents of nearby subdivisions are not deeply involved in the Pahoia community structure as are the town residents themselves."
- b. "Leading business people in the community were consulted."
- c. "... that something in the neighborhood of \$270,000 is attributable to tourist trade."

I. This support was one of the reasons for our selection of Subalternative A-1.

J.

1. The draft Puna Community Development Plan was completed about a year ago, however, as we understand, this plan will not be reviewed until the County General Plan is revised. This draft plan does recommend a makai alignment. Therefore, we believe that we should proceed with the project since it may be years before the Puna Community Development Plan is adopted.

2. Mr. Smythe's statements and questions, regarding the EIS, will be addressed in the Final EIS by our Environmental Consultants.

3. Mr. Smythe is concerned about the establishment of new businesses along the bypass route and the lowering of commercial property values in Pahoa Town.

3. The bypass route will be a limited access road, and only two connections to County roads will be permitted between Kahakai Boulevard and Pahoa-Kapoho Road. Business establishments will not be permitted direct access to the bypass road. In addition, the establishment of new businesses could be controlled by State Land Use Laws and County Zoning Ordinances.

K. Mr. Dennis Stout: Mr. Stout is concerned about land speculation along the proposed bypass route and zoning changes along the bypass route.

K. The evaluation is the same as for Comment I.3., above.