JOHN WAIHEE
GOVERNOR

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
AL PANG
JOYCE T. OMINE
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IN REPLY REFER TO:
HWY-DS
2.6819

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

MAY 10 1991

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OFC. OF ENVIRONMENTAL
QUALITY CONTROL

MEMORANDUM

TO: MR. BRIAN CHOY, ACTING DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: EDWARD Y. HIRATA, DIRECTOR
DEPARTMENT OF TRANSPORTATION

SUBJECT: NEGATIVE DECLARATION FOR KUHIO HIGHWAY
IMPROVEMENTS, LIHUE TO KEALIA
(LEHO DRIVE TO UHELEKAWAWA BRIDGE)
PROJECT NO. 56A-02-90

We are transmitting a completed "Document for Publication in the OEQC Bulletin", together with six (6) copies of the Environmental Assessment/Negative Declaration dated April 1991, for your further processing.

Enc.

1991-05-23-KA-FEA-

NOTICE OF DETERMINATION
NEGATIVE DECLARATION FOR THE PROPOSED
KUHIO HIGHWAY WIDENING AND RESTRIPING PROJECT

A. Proposing Agency

Highways Division, Department of Transportation (DOT), State of Hawaii

B. Approving Agency

Department of Transportation, State of Hawaii

C. Description of the Proposed Action

The proposed project involves minor widening of sections of Kuhio Highway, pavement restriping, and intersection and bridge improvements to create three travel lanes. These are interim improvements designed to allow contraflow traffic movement and alleviate severe traffic congestion during peak hours of operation. Even with these improvements, projected increases in traffic volume are expected to cause severe congestion in the future along this route, and additional improvements will be required. The DOT is considering a combination of a new by-pass road and further improvements to Kuhio Highway to accommodate future traffic volumes. Specific recommendations will be developed in DOT planning studies.

The location of this project is on the windward (northeastern) side of Kauai, between the entrance to Lydgate Park (Leho Drive) and Waipouli town center (Uhelekawawa Bridge). This section of Kuhio Highway is the major route which links Lihue and Kapaa and is the only highway option for residents who commute to jobs. It is also the major route used by visitors staying at the many hotels in the Wailua-Kapaa corridor and by residents and visitors shopping in the commercial complexes along this corridor.

D. Determination

The proposed action would not have a significant effect on the environment. The "Significance Criteria," Section 12 of Hawaii Administrative Rules Title 11, Chapter 200, "Environmental Impact Statement Rules," were reviewed and analyzed. Based on the analysis, the following were concluded:

1. no irrevocable commitment to loss or destruction of any natural or cultural resource would result;

2. the action would not curtail the range of beneficial uses of the environment;

3. the proposed action does not conflict with the state's long-term environmental policies or goals and guidelines;

4. the economic or social welfare of the community or state would not be substantially affected;

5. the proposed action does not substantially affect public health;

6. no substantial secondary impacts, such as population changes or effects on public facilities, are anticipated;

7. no substantial degradation of environmental quality is anticipated;

8. the proposed action does not involve a commitment to larger actions, nor would cumulative impacts result in considerable effects on the environment;

9. no rare, threatened or endangered species or their habitats would be affected;

10. air quality, water quality or ambient noise levels would not be detrimentally affected;

11. the project would not affect environmentally sensitive areas, such as flood plains, tsunami zones, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters or coastal waters.

E. Reasons Supporting Determination

The Environmental Assessment (EA) for the proposed action, which reflects the results of the public informational meeting of July 10, 1990 and the coordination undertaken with affected agencies and interested parties, is attached to support the determination of a Negative Declaration.

The proposed project primarily involves actions that are included on the Comprehensive Exemption List for the State of Hawaii DOT, as approved by the Environmental Council on November 14, 1990. Among the actions which are generally exempt from requirements regarding preparation of an EA are "Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height and dimensions as the structure replaced" (Exemption Class #2). Actions which are specifically exempted include:

"Upgrade or replace existing roadways...roadway markings and striping, roadway shoulders and curves...to meet acceptable safety standards."

"Reconstruction of an existing highway for safety purposes by widening less than one lane width, adding shoulders, and adding auxiliary lanes for localized purposes...."

"Restriping of existing roadways to provide an additional lane for use of car pools and buses during peak hours."

"Providing a contraflow for car pools and buses during peak hours by coning the opposite direction of travel."

Exemption Class #4 exempts minor alteration in the conditions of land, water, or vegetation, including "Paving of shoulder areas within existing highway rights-of-way for driveways and subdivision street connections."

F. Name, Address and Phone Number of Contact Person

Mr. Edward Y. Hirata
Highways Division
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813
Telephone: 548-3205

CONCURRENCE

By _____ 5/10/91
Date

The project location is Kuhio Highway, the only major route connecting Lihue and Kapaa, Kauai. The section between the Lydgate Park entrance (Leho Drive) and Waipouli town center (Uhelekawawa Bridge) is a two-lane highway with some left-turn storage lanes at selected intersections. Several resorts and commercial complexes have been developed along this corridor, and it is the only possible route for residents commuting between Lihue and Kapaa.

Average daily trips through this corridor are projected to increase from 26,835 in 1989 to 49,800 in 2010, thereby worsening an already congested corridor. The purpose of this project is to provide immediate relief for some of the traffic congestion during peak hours of operation through immediate improvements within the existing Kuhio Highway right-of-way that will facilitate contraflow traffic. Construction would occur in three phases:

PHASE I Create three travel lanes along the 0.9-mile section of roadway between the Lydgate Park entrance (Leho Drive) and Haleilio Road, primarily by restriping but also through minor construction of new pavement within the existing right-of-way. Create left-turn storage lanes at the intersections with Leho Drive and Marina Road. The existing Wailua Bridge is a two-lane bridge. A third lane will be directed over the existing one-lane Lihue Plantation Bridge and for Kapaa-bound traffic during the morning and afternoon peak traffic periods. Guardrails and other improvements to the Lihue Plantation Bridge will be constructed. A right-turn storage lane will be constructed coming out of Kuamoo Road. New pavement, retaining walls, restriping, modification to the existing traffic signal system, and other miscellaneous improvements will be made at this intersection. All work will be within the existing right-of-way.

PHASE II Create three travel lanes along the 0.9-mile section of roadway between the intersection with Haleilio Road and Uhelekawawa Stream Bridge, primarily by restriping but also through minor construction of new pavement within the existing right-of-way. Create left-turn storage and acceleration lanes at selected intersections.

PHASE III Widen the existing two-lane Uhelekawawa Stream Bridge. Relocate existing utility lines.

CONTRA-FLOW OPERATION In 1990, a 2.7-mile length of Kuhio Highway, beginning at the Hanamaulu end of Kapule Highway and ending at Leho Drive, was restriped to create three travel lanes. The proposed project will complete highway widening, restriping, intersection and bridge improvements from Leho Drive to Waipouli so that the entire three-lane route can be utilized for contra-flow traffic operation during peak travel hours.

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F. Name, Address and Phone Number of Contact Person

Mr. Edward Y. Hirata
Highways Division
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Telephone: 548-3205

CONCURRENCE

By Edward Y. Hirata

5/10/91
Date

KUHIO HIGHWAY IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Prepared by:
GK & Associates
for:
Shimabukuro, Endo & Yoshizaki, Inc.

APRIL 1991

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1.0 PROJECT DESCRIPTION

The project location is Kuhio Highway, the only major route connecting towns on the windward (northeastern) side of the island of Kauai (Figure 1). The section between the Lydgate Park entrance (Leho Drive) and Waipouli town center (Uhelekawawa Bridge) is a two-lane highway with some left-turn storage lanes at selected intersections. Several resorts and commercial complexes have been developed along this corridor, and it is the only possible route for residents commuting to jobs in Lihue and Kapaa. Consequently, congestion has worsened as the result of increased traffic volume.

Average daily trips through this corridor are projected to increase from 26,835 in 1989 to 49,800 in 2010 (see Table 1)(Kaku Associates, 1990). The existing highway lacks the traffic carrying capacity to handle present and future peak hour travel demand. The purpose of this project is to provide immediate relief for some of the traffic congestion during peak hours of operation through immediate improvements within the existing Kuhio Highway right-of-way that will facilitate contraflow traffic. Construction would occur in three phases (see Figure 2a-c):

PHASE I

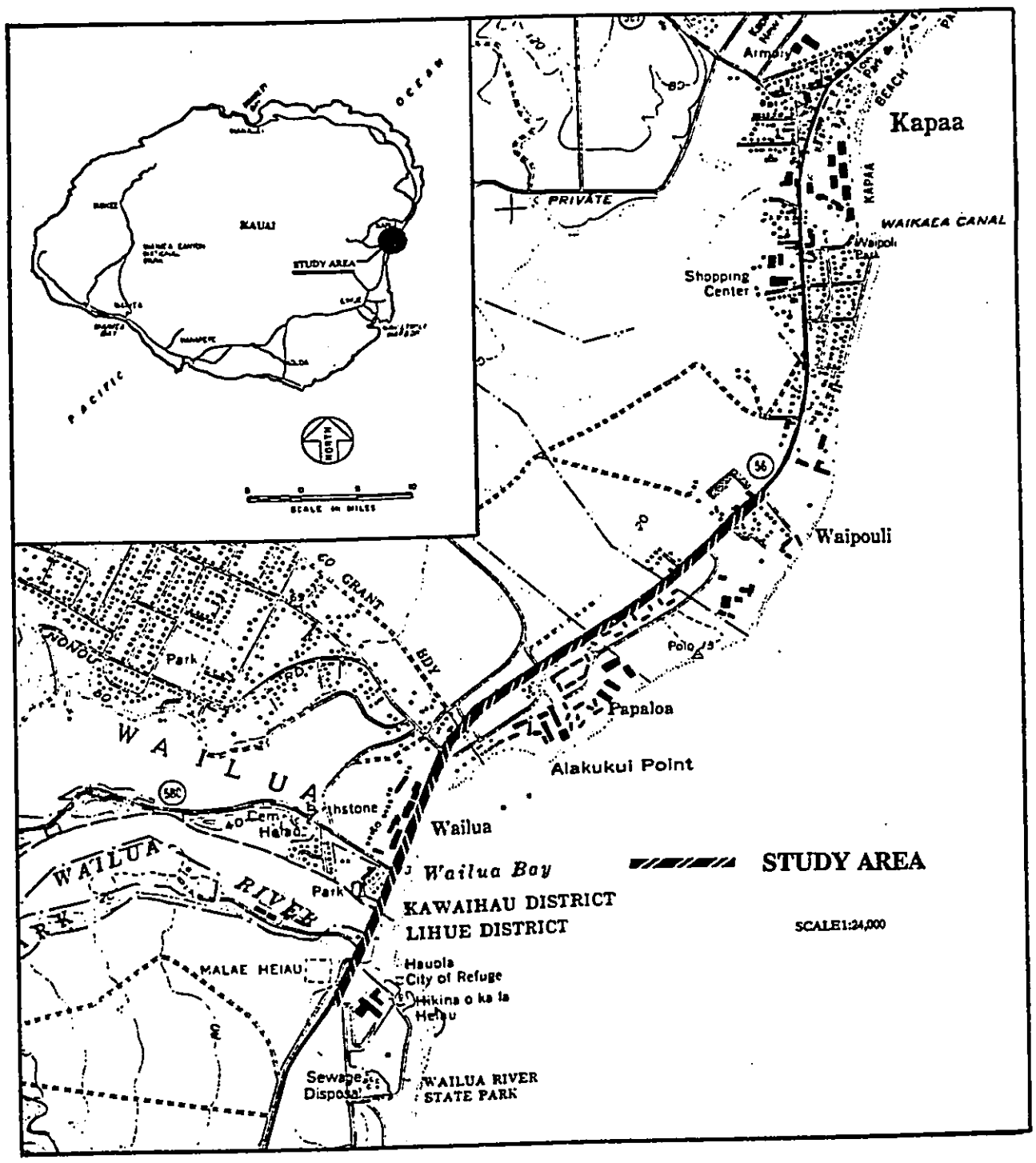
- Create three travel lanes along the 0.9-mile section of roadway between the Lydgate Park entrance (Leho Drive) and Haleilio Road, primarily by restriping but also through minor construction of new pavement within the existing right-of-way.

- Create left-turn storage lanes at the intersections with Leho Drive and Marina Road.

- The existing Wailua Bridge is a two-lane bridge. A third lane will be directed over the existing one-lane Lihue Plantation Bridge and will only be used for Kapaa-bound traffic during the morning and afternoon peak traffic periods. Guardrails and other improvements to the Lihue Plantation Bridge will be constructed, with details to be coordinated with the Lihue Plantation. This bridge was originally designed for trains and is more than capable of bearing one lane of automobile traffic. It has been inspected by DOT engineers.

- A right-turn storage lane will be constructed coming out of Kuamoo Road. New pavement, retaining walls, restriping, modification to the existing traffic signal system, and other miscellaneous improvements will be made at this intersection. All work will be within the existing right-of-way.

FIGURE 1
PROJECT LOCATION



PHASE II

- Create three travel lanes along the 0.9-mile section of roadway between the intersection with Haleilio Road and Uhelekawawa Stream Bridge, primarily by restriping but also through minor construction of new pavement within the existing right-of-way.

- Create left-turn storage and acceleration lanes at selected intersections.

PHASE III

- Widen the existing two-lane Uhelekawawa Stream Bridge. Relocate existing utility lines.

CONTRA-FLOW OPERATION

In 1990, a 2.7-mile length of Kuhio Highway, beginning at the Hanamaulu end of Kapule Highway and ending at Leho Drive, was restriped to create three travel lanes. The proposed project will complete highway widening, restriping, intersection and bridge improvements from Leho Drive to Waipouli so that the entire three-lane route can be utilized for contra-flow traffic operation during peak travel hours.

Two lanes will carry traffic in the Kapaa-bound direction during normal (off-peak) and afternoon peak hours. One lane, with left-turn storage lanes, will carry traffic in the Lihue-bound direction. The Wailua River Bridge crossing will have one lane of traffic in each direction during off-peak and afternoon peak hours. During the afternoon peak, a second lane of Kapaa-bound traffic will be directed over the Lihue Plantation Bridge.

During the morning peak hours, one regular lane and an additional contra-flow lane will carry Lihue-bound traffic and the third lane will carry Kapaa-bound traffic. The two Lihue-bound lanes will cross the Wailua River Bridge and the Kapaa-bound lane will be directed over the Lihue Plantation Bridge.

During the normal (off-peak) hours, the Lihue Plantation Bridge will be closed.

LONGER-TERM IMPROVEMENTS

Even with these improvements, projected increases in traffic volume are expected to cause severe congestion in the future, and additional improvements will be required. Peak a.m. flow through the Wailua-Kapaa corridor is projected to increase by 40% above the present volume by the year 2010, and p.m. peak flow is expected to nearly double during the same period (see Table 1). The DOT is considering a combination of a new by-pass road and further improvements to Kuhio Highway to accommodate future traffic volumes. Specific recommendations will be developed in DOT planning studies.

FIGURE 2a
PHASE I - LEHO DRIVE TO HALEILIO ROAD

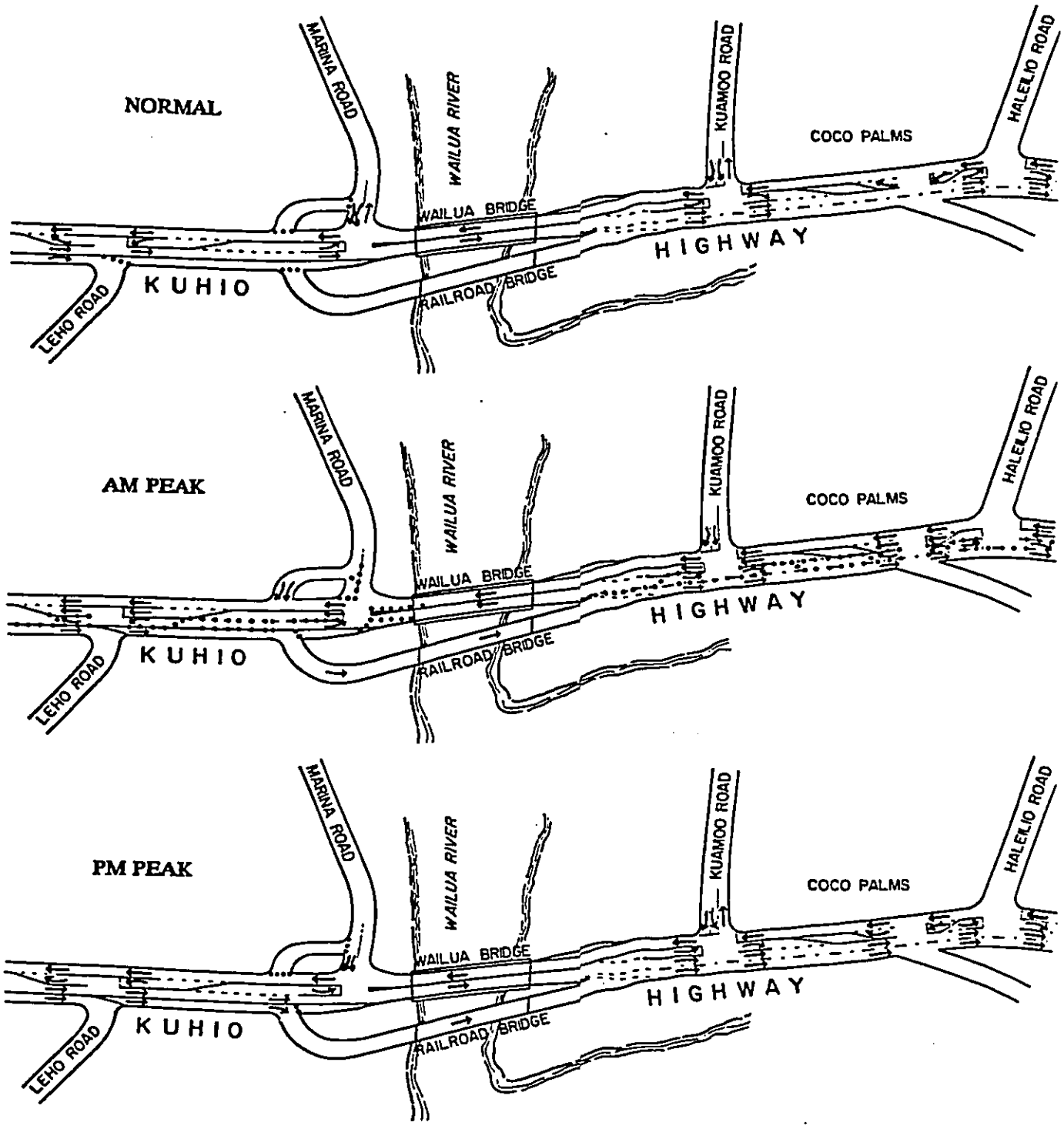
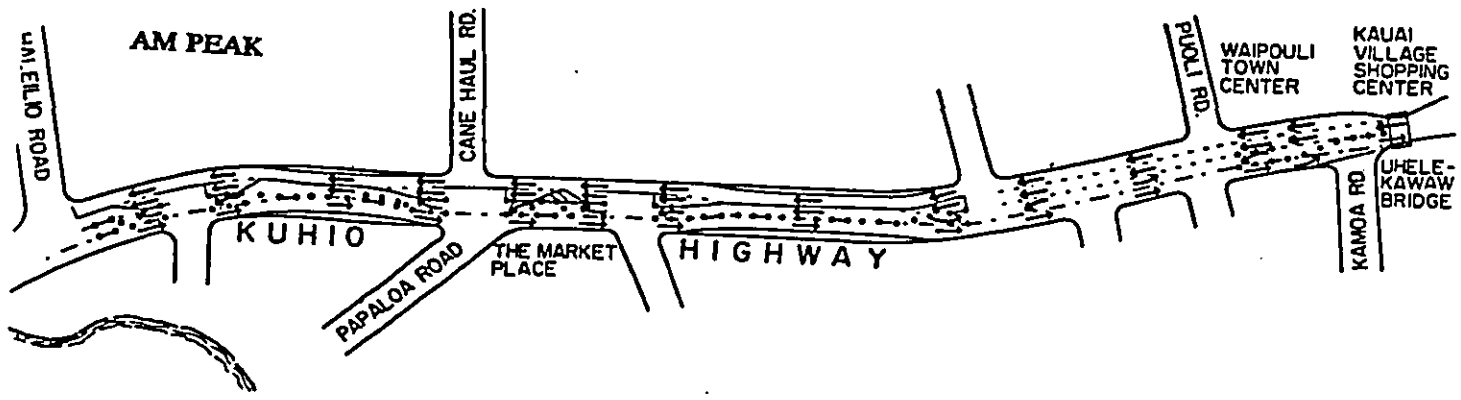


FIGURE 2b
PHASE II - HALEILIO ROAD TO UHELEKAWAWA BRIDGE



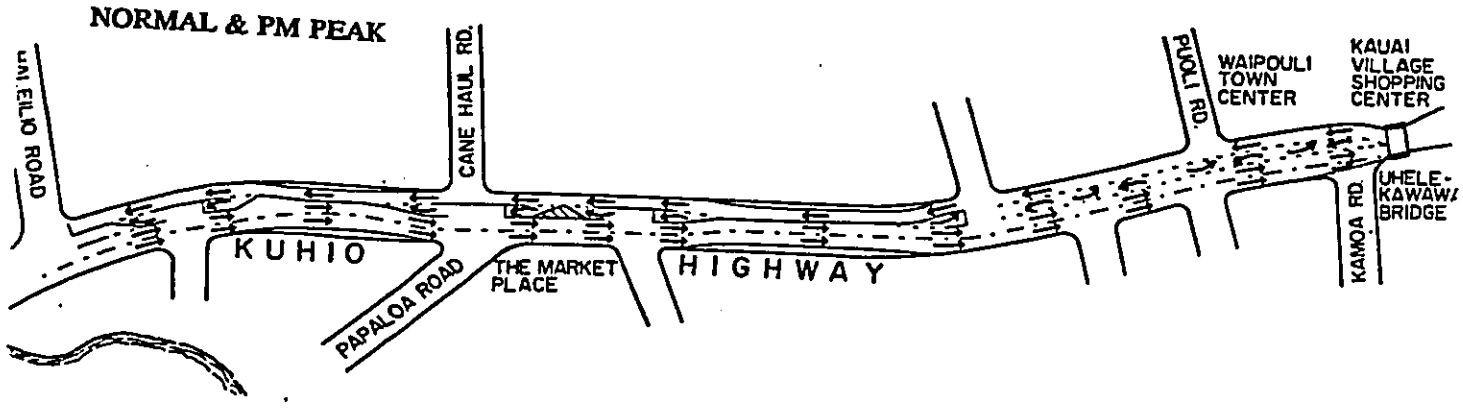
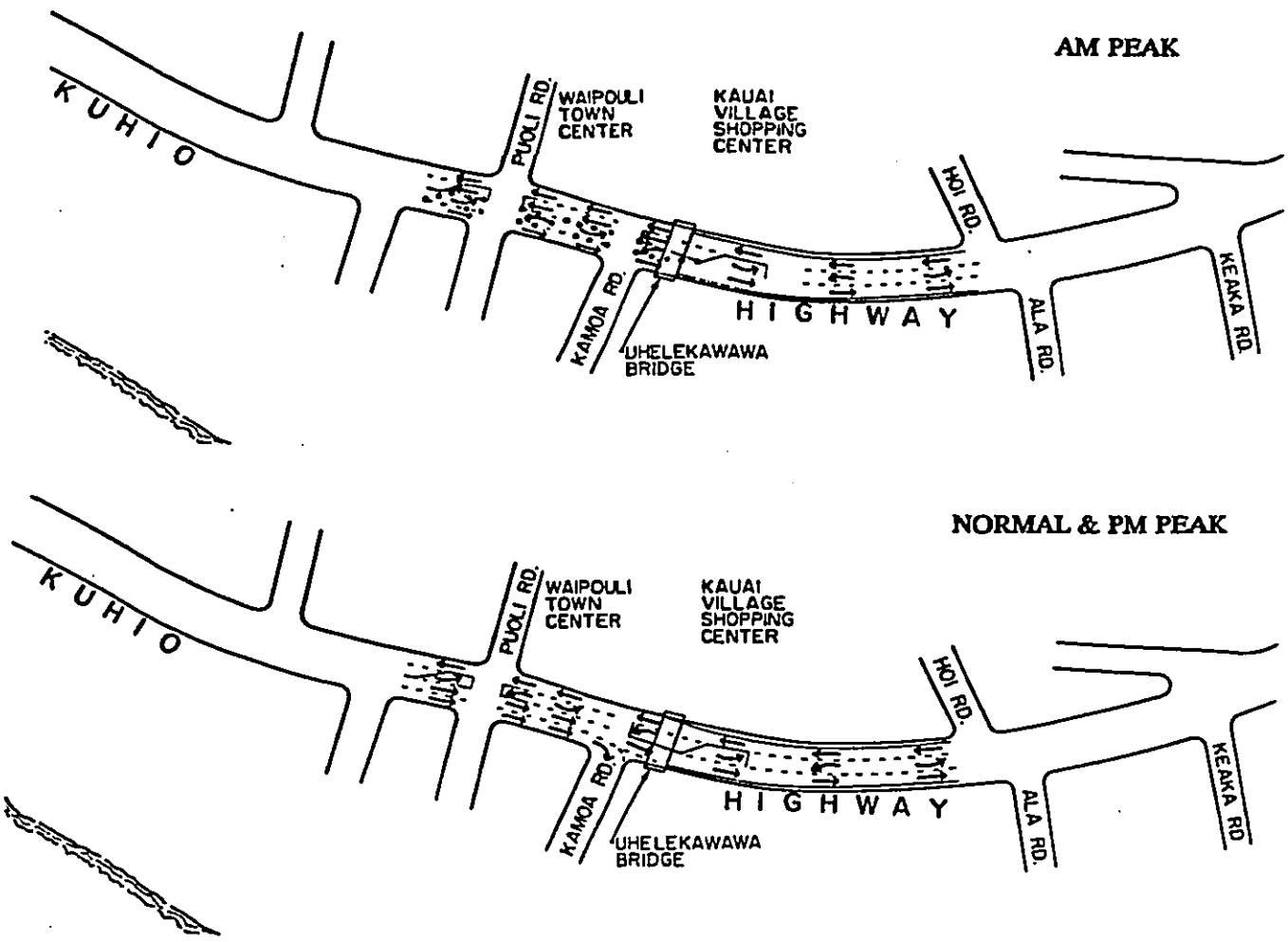


FIGURE 2c
PHASE III - UHELEKAWAWA BRIDGE



2.0 ALTERNATIVES

2.1 ALTERNATIVE A - INTERIM IMPROVEMENTS FOR CONTRAFLOW AND PLANNING STUDIES FOR LONG-TERM IMPROVEMENTS

Alternative A offers immediate relief for the severe peak-hour traffic congestion along the Wailua-Kapaa section of Kuhio Highway. Three travel lanes would be created by a combination of restriping, minor construction of new pavement within the existing right-of-way, and intersection and bridge improvements. One of the lanes would be used for contraflow operation during peak hours.

Contraflow operation alone will not accommodate long-term increases in traffic volume expected through this busy section of Kuhio Highway. The Department of Transportation is considering a combination of a new by-pass road and further improvements to Kuhio Highway. Specific recommendations will be developed in DOT planning studies. No matter what long-term plan is developed, the existing two-lane bridge over Uhelekawawa Stream at Waipouli would be a traffic bottleneck. Widening of this bridge to four lanes with a left turn lane is, therefore, one of the improvements proposed under the present project.

2.2 ALTERNATIVE B - NO INTERIM IMPROVEMENTS; FOCUS ON LONG-TERM IMPROVEMENTS

Alternative B would allocate the available funding to plan, design and construct long-term improvements to Kuhio Highway and perhaps to build a new by-pass road. This alternative assumes that funding diverted for interim improvements for contraflow operation could postpone or jeopardize longer-range improvements which will be needed to cope with projected traffic increases over the next 20 years. P.M. peak flow through the Wailua-Kapaa corridor is expected to nearly double by the year 2010.

The cost of creating a contraflow system along this route is rather small compared to the cost of building a new by-pass road or of acquiring the land necessary for a major widening of the existing Kuhio Highway right-of-way. Long-term improvements do not have to be sacrificed to accomplish interim improvements in traffic flow. For example, the final phase of Alternative A is the widening of a two-lane bridge across Uhelekawawa Stream. This improvement will be essential in any long-range plan for upgrading Kuhio Highway.

2.3 ALTERNATIVE C - TRANSPORTATION SYSTEM MANAGEMENT

In metropolitan areas, several strategies (termed transportation system management or TSM) are possible to achieve more efficient use of existing highways without new construction:

- Improve public transportation

- Encourage flex-time work hours
- Encourage ride-sharing (carpools, van-pools)

Kauai County is currently experimenting with bus service (The Kauai Bus) (TenBruggencate, 1991). Five schedules will be tested through May, 1991. The routes include "The Lihue Express" from Kapaa to Lihue in the morning; "The Kapaa Express" from Lihue to Kapaa in the afternoon; and the Wailua, Lihue and Coconut Coast Shuttles throughout the day.

The worst congestion occurs during the afternoon peak period in the Kapaa-bound direction from Lihue, the major job center on Kauai. Government programs to encourage flex-time hours could alleviate traffic during the afternoon peak to some degree, but there are a large number of businesses from which workers commute. There is no single company large enough to make an impact on traffic flow by implementing flex-time work hours.

Ride-sharing is feasible in high-density areas where neighbors have similar rush hour destinations, or for co-workers who share the same employer. The low population density on Kauai, as well as the distribution of workers among a large number of employers, will continue to discourage this approach.

2.4 ALTERNATIVE D - "NO-ACTION"

The "no-action" alternative would allow traffic congestion along this section of Kuhio Highway to continue to worsen. Time lost by motorists would constitute a negative economic impact. A general erosion of the "Aloha Spirit" of Kauai motorists could be expected as the level of inconvenience rises. The visitor industry could suffer as negative experiences due to traffic congestion are reported. Energy consumption would rise unnecessarily as a result of excessive vehicle idling. The "no-action" alternative is favored by none of the affected or responsible parties.

2.5 THE PREFERRED ALTERNATIVE

Alternative A is preferred because it allows for some immediate relief of traffic congestion while recognizing the need for long-range improvements to meet traffic needs 20 years in the future. Implementation of Alternative A will not sacrifice funding needed for the long term (Alternative B). Non-construction strategies (Alternative C) for improving the efficiency of the existing roadway can continue to be encouraged, but implementation of such strategies will probably have to await higher population densities and more concentrated employment bases on Kauai.

2.6 TENTATIVE PROJECT SCHEDULE

The projected schedule for the three phases is as follows.

PHASE I

Design Completion	1991
Begin Construction	1991
Complete Construction	1992

PHASE II

Design Completion	1991
Begin Construction	1991
Complete Construction	1992

PHASE III

Design Completion	1991
Begin Construction	1992
Complete Construction	1992

2.7 PRELIMINARY COST ESTIMATES

The estimated costs for construction and annual contraflow operations are as follows.

PHASE I

Construction	$900,000
Contraflow Annual Operation	$40,000

PHASE II

Construction	$500,000
Contraflow Annual Operation	$40,000

PHASE III

Construction	$800,000

3.0 SUMMARY DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 EXISTING HIGHWAY AND TRAFFIC

The section of Kuhio Highway between the Lydgate Park entrance (Leho Drive) and Waipouli town center is a two-lane highway with bridges crossing Wailua River and Konohiki Stream. There are left-turn storage lanes at selected intersections. The intersections with Kuamoo Road and Haleilio Road are signalized. The existing volume to capacity ratios (V/C) for a.m. and p.m. peak hours are 1.44 and 1.54, respectively. Both of these ratios correspond to a level of service F, the worst possible condition and indicative of a total breakdown of flow with stop-and-go operation. Although the p.m. peak traffic volume is presently less than the a.m. peak flow (Table 1), the level of service is worse in the p.m. because of vehicles making left-turns from Kuhio Highway at Kuamoo Road and other intersections along this corridor (Table 2).

Hotels and commercial businesses along this route are set back from the roadway except in a few areas where structures crowd the existing highway shoulders and right-of-way. Rock walls bordering Wailua Beach and the Coco Palms Hotel confine the highway along Wailua Bay. Commercial structures are built close to the existing pavement at the intersections with Papaloa and Lanikai Roads, where there are telephone poles in the right-of-way. Commercial structures also crowd the right-of-way in the Waipouli commercial center (near the intersection with Pouli Road). The right-of-way is narrowed across the Wailua River and Konohiki Stream (Uhelekawawa) bridges.

TABLE 1
EXISTING AND PROJECTED TRAFFIC VOLUMES

MEASURE	1989	2010	% CHANGE
Average Daily Trips (ADT)	26,835	49,800	85.6
A.M. Peak	1,388	1,940	39.8
P.M. Peak	1,295	2,530	95.4

Source: Kaku Associates, 1990

The Kauai County Highway Planning Study (Kaku Associates, 1990) examined three intersections in the present study area. Table 2 summarizes the levels of service at those

locations. Improvements to the highways between Lihue and Kapaa were accorded the highest priority of any area on the island.

TABLE 2
INTERSECTION LEVELS OF SERVICE

INTERSECTION	AM	PM
Kuhio Highway at Coconut Plantation	E	F
Kuhio Highway at Haleilio Road	E	F
Kuhio Highway at Kuamoo Road	D	D

Source: Kaku Associates, 1990

There is a moderate amount of pedestrian traffic across Wailua River Bridge, between the Marina and nearby hotels, and between the hotels and Wailua Beach. In most areas, there is ample space off the highway shoulder for safe walking. The pedestrian crossing from the Coco Palms Hotel to Wailua Beach can, however, be dangerous. The most dangerous areas for vehicular and pedestrian traffic are near the Papaloa Road and Waipouli commercial areas, where drivers make left turns into commercial establishments across the Kapaa-bound traffic lane.

Department of Transportation accident statistics for the project area during the period 1986-1988 show that there were 138 accidents involving 272 motor vehicles, one motorcycle, two bicycles and two pedestrians. Most of the accidents (81) involved only property damage, 55 involved some injuries to a total of 83 people, and two accidents resulted in two fatalities.

3.2 GEOLOGY, TOPOGRAPHY AND DRAINAGE

The project route lies mostly within the coastal apron of Koloa Volcanic Series lavas in the Wailua-Waipouli plain, which is characterized by narrow lowlands of alluvium extending inland to dissected hills of old lavas which mark the now-collapsed eastern flank of the original shield volcano. Thin layers of alluvium cover coastal sand deposits in most areas, but thick sedimentary material overlies the Waipouli area (Takasaki, 1977).

The Wailua River drains an area of about 53 square miles and discharges perennially into Wailua Bay, a drowned stream valley formed during a lower stand of the ocean. The other major perennial channel is Konohiki Stream, which splits into two branches upon

reaching the coastal plain. The southern branch drains a 3.5 square mile area, crossing under Uhelekawawa Bridge. The lower 2.5 miles of this channel has been realigned (Timbol and Maciolek, 1978). Only stream flow which rises above the crest gaging station at the bridge reaches the ocean. The northern branch angles toward Kapaa, discharging into the ocean through the Waikaea Canal.

Extremely heavy rainfall and stream runoff can cause flooding at the bridges crossing both streams, but is a less probable occurrence at the Wailua River Bridge. Sand deposits at the head of Wailua Bay commonly bar discharge from the river.

The coastal plain of windward Kauai is subject to tsunami flooding. The tsunami of 1957 caused flooding to elevations of 10-14 feet along the project route (Loomis, 1976). In most areas, the highway lies well below the 20-foot elevation.

3.3 SHORELINE AND NEARSHORE

Wailua Beach extends north from the mouth of Wailua River for approximately 2,500 feet. The north end of the beach is more stable than the south end, which terminates at the mouth of the Wailua River and which is subject to erosion when the river floods. The 100-foot wide beach is bounded at both ends by lava outcrops (Moberly, et al., 1963; U.S. Army Corps of Engineers, 1971).

The submerged valley of Wailua River has largely been filled with sediment to form shallow Wailua Bay (Cox and Gordon, 1970). The bay is exposed to strong tradewind-generated waves. Offshore areas consist primarily of sand deposits, in some areas overlying beachrock formations (Moberly, et al., 1963).

The shorelines of Papaloa and Waipouli are almost totally developed with resort complexes that line the narrow to moderately wide sandy beach extending from Wailua. Permanent beach erosion has occurred in several areas, evidenced by a number of seawalls and groins constructed to prevent further loss of beachfront property. The offshore bottom is moderately shallow and primarily rocky, but sandy pockets along the shoreline provide ocean access. Several beach sections are fronted by narrow outcrops of beachrock that are emergent at low tide (AECOS, 1982).

3.4 SOILS

There are four major soil types along the project route. At the head of Wailua Bay, Kuhio Highway borders a narrow strip of sandy soil (Jaucas soil series) along the backshore of Wailua Beach. The alluvial plain at the mouth of the Wailua River and in the area between the Market Place and Waipouli is characterized by fine sandy loam (Mokuleia series). Areas north of the Wailua River mouth to the Market Place have gently sloping silty clays (principally of the Lihue soil series) which formed from erosional topography of the island's original shield volcano. Silty clays that are more stony (Koloa soil series)

predominate immediately south of the Wailua River adjacent to the Wailua River Bridge and the Lihue Plantation Bridge.

All of these soil types are well drained, and their erosion hazard is slight (USDA, 1972).

3.5 HYDROLOGY AND WATER QUALITY

The project area receives an average annual rainfall of 50 inches, the majority during the October-March period.

Wailua River and Konohiki Stream are the only perennial channels in the project area. The lower reaches of Wailua River are estuarine (tidally influenced) where the river crosses the coastal plain into Wailua Bay. A sand bar extending from Wailua Beach commonly restricts the mouth of the river, ponding stream flow in a large "muliwai" behind the sand deposits. Water in the muliwai under the Wailua River Bridge and Lihue Plantation Bridge is restricted in circulation. Trade winds mix the upper few inches of ponded water, but sub-surface waters had a distinct green appearance at low tide (0') on March 3, 1991. This suggests high nutrient concentrations and high phytoplankton productivity.

Surface runoff from drainage areas north of the Wailua River is intercepted in upland areas for sugarcane irrigation. A few smaller, intermittent channels cross the project area.

Koloa Volcanic Series lavas carry many discontinuous perched-water bodies which seep to the surface at upper elevations and carry basal water near the coast where lavas extend below sea level. Basal groundwater is locally important for domestic well supply (Takasaki, 1977). The County of Kauai plans to connect the Kapaa-Waipouli area to a sewage treatment plant in the Lydgate Park area which already services the Wailua area. Treated effluent is pumped to sea through an outfall extending 600 feet from shore to a 30-foot depth.

The sewer project will eliminate many of the cesspools and injection wells in the Kapaa-Waipouli area, which have been a source of concern about coastal water quality along this coast (Takasaki, 1977). Coastal waters fronting the Wailua-Kapaa coast are classified "A" for purposes of State Department of Health water quality regulations.

The Department of Health has recently initiated sampling for bacterial concentrations at two locations, in Wailua River behind Wailua Beach Park and offshore of the beach park in marine waters. The data indicate a potential public health hazard in both the Wailua River and Wailua Beach Park recreational areas.

3.6 FLORA AND FAUNA

Existing vegetation along the margins of Kuhio Highway, within the project area, is mostly introduced grasses, weeds, shrubs and sugar cane largely adapted to frequent roadside disturbances. The major exception is along the highway margin fronting Wailua Bay, where low backshore dunes are vegetated by a mixture of tree heliotrope (*Messerschmidia agentea*), ironwood (*Casuarina* sp.), hala or screwpine (*Pandanus odoratissimus*), beach naupaka (*Scaevola taccada*), and koa haole (*Leucaena leucocephala*). The native plants along this section of roadside are not listed as threatened or endangered species.

A plantation of coconut palms (*Cocos nucifera*) borders both sides of Kuhio Highway just north of the Market Place.

Roadside environments vegetated by introduced grasses and shrubs or sugarcane provide some degree of habitat for the typical array of exotic birds and mammals that one would expect at coastal elevations and in this type of environment throughout the island.

A dense overgrowth of hau (*Hibiscus tiliaceus*) lines the banks of the Wailua River along much of its lower reaches. The shores of the river drop steeply towards the center. The lowest flatland along Wailua River, once a tidal marsh, was modified considerably in the 1960's by the construction of a tropical botanical garden containing seven shallow ponds. A portion of the undeveloped marshlands can still be found adjacent to the botanical garden. The various wetland areas in the Wailua River bottomland provide a diversity of habitat for waterbirds, especially the gallinule (*Gallinula chloropus sandvicensis*)(Ahuimanu Productions, 1977).

Wailua River and Konohiki Stream have been evaluated as having an ecological rating of III: moderate to low natural and/or water quality (well exploited, modified or degraded). The stream fauna of the lower reaches of Wailua River are primarily exotic species, especially small mouth black bass (*Micropterus dolomieui*)(Timbol and Maciolek, 1978).

3.7 ARCHAEOLOGY AND HISTORICAL SITES

The Wailua area is rich in archaeological remains, including major heiau, mostly in the Wailua Valley between the coast and the 200-foot elevation. The heiau complex in the vicinity of Wailua State Park has been recognized by the U.S. National Park Service as a National Historic Landmark. The complex consists of 5 discontiguous properties: Hikinaakala Heiau (including Haola, a sacred place of refuge, and several petroglyph boulders in Wailua River), Malae Heiau, Holoholoku Heiau and Pohaku Hoohanau, Poliahu Heiau and the Bellstone. These features are described by Dunbar (1988). None are in the Kuhio Highway right-of-way.

Nearest the project area are Malae Heiau, in a cane field inland of the highway on the south side of Wailua River, and Hikinaakala Heiau, in the Lydgate Park area seaward of the highway along the south bank of the Wailua River. Approximately 130 feet north of Hikinaakala Heiau are a series of petroglyphs that are visible at low tide on river boulders.

The Kuhio Highway right-of-way crosses an area of concern to archaeologists because of the possibility of ancient burials. Burial deposits along the backshore at Waipouli (site #1836, State Historic Preservation Division) may extend inland as far as Kuhio Highway, near its intersections with Puoli Road and Kamoa Road. Portions of this area have been developed for residential and commercial uses, but if there were no large-scale disturbance of existing topography, deposits may still exist under the developed areas and the highway right-of-way.

The County of Kauai plans to install a sewer line beneath Kuhio Highway from Kapaa to Wailua State Park, where the sewage treatment plant is located. The results of the archaeological survey for that project (Cultural Surveys Hawaii, 1991) are directly relevant to the highway project, and are summarized here with the kind permission of Dr. Hallett H. Hammatt, Principal Archaeologist, Cultural Surveys Hawaii (CSH).

In the CSH survey, thirteen backhoe trenches and 15 hand-dug trenches were excavated within the alignment of a proposed sewerline along Kuhio Highway from the Wailua Sewage Treatment Plant south of the Wailua River Bridge to Kapa'a Town, an area encompassing the entire study area for this environmental assessment. CSH divided the area into seven segments, four of which are of relevance here. The paragraphs below summarize the CSH findings in the segments of interest to this assessment.

Section 1: Leho Drive to Wailua Bridge. Most of the sediment near the bridge is modern fill placed for bridge and highway construction. The Leho Drive area has been heavily modified by resort and highway construction. The area was formerly used for sugar cane cultivation. All sediments are clay loam alluvial deposits and archaeological sensitivity is low.

Section 2: Wailua Bridge to Papaloa Road. A backhoe trench to the north of Wailua Bridge showed an abandoned roadbed east of the present bridge. Eight hand-dug trenches dug *makai* of the road berm (where the sewer line is planned) all showed modern beach sand with no cultural layer below the modern A Horizon. Despite the absence of a cultural layer, there is the possibility in this section of locating burials in natural shoreline sand deposits. The archaeological sensitivity of this segment is rated moderate.

Section 3: Papaloa Road Between its Southern and Northern Intersections With Kuhio Highway. The weathered clay loam soils and alluvium comprising an ancient lava flow were formerly used for cane cultivation. The archaeological sensitivity is low as a result of the heavy terrestrial soils and

extensive impact of cultivation.

Section 4: Kuhio Highway from Papaloa Road to Konohiki (Waipouli) Stream. This section is similar to Section 2 in that modern A Horizons overlay beach sand, and no buried cultural layers were found. Again, despite the probability that the area has been heavily disturbed in modern times, the possibility of uncovering isolated burials remains, and the archaeological sensitive of this section is rated moderate.

The Lihue Plantation Bridge was constructed as a railroad bridge in 1932, but has been modified to accommodate vehicular traffic.

3.8 LAND USE AND DEVELOPMENT PLANS

The land corridor which borders the Kuhio Highway project area is developing rapidly. Present land uses include:

- RESORT (Kauai Aston, Coco Palms, Coconut Plantation)
- PUBLIC RECREATION (Lydgate Park, Wailua River State Park, Wailua Beach)
- COMMERCIAL (complex of convenience stores, restaurants, shopping village at Haleilio Road intersection; the Market Place; Waipouli commercial complex)
- AGRICULTURE (sugarcane, pasture north of Haleilio Road intersection to Coconut Plantation)
- RESIDENTIAL (scattered houselots along main highway north of Haleilio Road intersection and in Waipouli; higher-density buildings on side roads east of the main highway in Waipouli).

State and County land use classifications provide an indication of future development potential in the area. The land bordering the Kuhio Highway project area is classified as Urban under the State Land Use Law except that the land beneath the Wailua River is classified Conservation.

The 1982 Kauai General Plan Update (Planners Collaborative, et al., 1982) describes the area as Resort along the shore and Public Facilities, Open, Urban Residential and Agriculture inland of Kuhio Highway.

The Kapaa Wailua Development Plan (LMNI, 1973) indicates a mixture of residential, resort, commercial, special treatment-public, and open along this section of Kuhio Highway.

As a State highway, the right-of-way itself does not have a tax map key number (TMK). The TMKs of parcels adjacent to the highway in the area of the proposed

improvements are as follows: 3-9-02:13,21,28; 3-9-04:6; 3-9-06:12,16; 4-1-03:7,17,39,44; 4-1-04:5,6,7,8,20; 4-1-05:3,4,5,7,8,9,14,17,21; 4-3-01:1,5,6,7,8,9,14,19; 4-3-02:6,8,17,18; 4-3-06:1,2,3,7; 4-3-07:3,4,14,16,17,18,19,22,26,27,29,30; and 4-3-08:1,2,9,14.

3.9 RECREATIONAL LANDS

The entire Wailua River area is one of exceptional interest from geological, archaeological, historical, aesthetic and recreational points of view. The Wailua River State Park comprises 1,113 acres, with over half of the acreage in reserve. The remaining lands, situated primarily on the banks near the river mouth at Wailua Beach, support a variety of developed commercial, recreational, and historical sites that receive heavy usage from both tourist and local populations. These sites include Lydgate State Park, the Wailua River Marina, the Wailua River State Park - Kaumuali'i Area, and the Wailua Complex of Heiau (AECOS, 1982).

The Wailua River Marina provides a center for the commercial activity taking place on the Wailua River, often called the only navigable river in the state. Excursion boats carry visitors from the marina to the headwaters of the South Fork estuary and a fern grotto nearby (Grace, 1974). In addition to providing docking space and support facilities for the excursion boats, the marina offers a variety of concessions, a restaurant, and ample parking.

Located directly across the river from the marina, the Kaumuali'i area of the park provides access to the river for the general public with a boat ramp, parking for automobiles and trailers, and a small park for picnickers. Boaters launch here usually to fish or water ski in the river, which is navigable for several miles upstream. A shallow sand bar usually prevents any vessels, except those with very shallow drafts, from entering the ocean, even at high tide (Grace, 1974). The sandbar occasionally disappears for short periods of time, usually after several days of heavy rain which results in the river flooding and eroding away all of the sand at its mouth. Jet skiers and outrigger canoe paddlers also use the river for practicing and racing (AECOS, 1982).

Wailua Beach, with its constant shorebreak spread out over a lengthy, shallow sandbar, is a popular destination for tourists from the surrounding resort complexes. The Coco Palms Hotel is situated directly across Kuhio Highway from the beach. A beach concession offers a variety of rental equipment for aquatic activities. The most popular pastimes at Wailua Beach in addition to sunbathing and swimming, are bodysurfing, bellyboarding, and board surfing (AECOS, 1982).

Sand deposits block the Wailua River mouth during dry periods, closing the channel to the ocean and ponding stream flow in a large "muliwai" which extends under the Kuhio Highway bridge. The sand bar is periodically dredged to clear a channel to the ocean.

The section of beach between Papaloa and Waipouli attracts tourists for swimming, sunbathing and strolling. Local fishermen also visit this area for shorecasting and sometimes

for skindiving when the ocean is calm and underwater visibility is good. There are public rights-of-way to the ocean off Papaloa Road and off Kuhio Highway (AECOS, 1982).

3.10 AESTHETICS/VIEWS

Kuhio Highway affords excellent views of the ocean where it crosses Wailua River and borders Wailua Bay. The road is shielded from ocean views where it turns inland at Waipouli, but views of the Nonou Ridge ("Sleeping Giant") are unobstructed along the entire project route. The coconut plantation on both sides of Kuhio Highway north of the Market Place is another scenic point along the Waipouli portion of the project route.

4.0 IMPACTS AND MITIGATING MEASURES

4.1 AIR QUALITY

The rural environment of windward Kauai and exposure to tradewinds maintains good circulation and air quality. There is no reason to believe that carbon monoxide from vehicle exhaust emissions is presently a problem. This project is expected to improve the traffic flow rate, not increase the total volume. Total emissions should remain the same or decrease due to more efficient traffic movement, therefore mitigation measures are not necessary.

4.2 NOISE

The most sensitive receptor locations for traffic noise are resorts and recreational sites along the project route where there is outdoor activity. Most of the resorts are set back from the highway and are shielded by vegetation. The hotel closest to the road (Coco Palms) is well buffered by vegetation. Rush hour traffic can be heard in the hotel's driveway and parking areas but is not noticeable inside the complex. Wailua Beach is likewise well buffered by vegetation planted along the roadside, and this tends to mitigate the impact of traffic noise. Restaurants and shops which are close to the right-of-way near the intersections with Papaloa Road and in Waipouli are enclosed, so traffic noise does not affect their customers. The Kuhio Highway improvements are expected to change the traffic flow rate but not the total volume.

In most areas, noise levels should remain the same or decrease with more efficient traffic movement. Stop-and-go traffic is generally more noisy that free-flowing traffic, especially when heavy vehicles are a significant proportion of the vehicle mix.

4.3 UTILITIES AND PUBLIC SERVICES

Telephone/electric poles are close to the existing pavement near the Wailua River and fronting Wailua Beach and they are inside the paved right-of-way at the Papaloa and Lanikai Road intersections and in the Waipouli town center. Planned for relocation are the

following:

- Kuamoo Road - 2 each
- Kuamoo/Kuhio intersection - 1 each
- Those along Kuhio Highway between Haleilio Road and Uhelekawawa Bridge

The widening of Uhelekawawa Bridge will require relocation of underground utilities.

The County of Kauai is planning to install a sewer line under Kuhio Highway from Kapaa to the sewage treatment plant at Lydgate Park. Pavement widening and restriping along this route will not affect the design or schedule of the sewer project, except perhaps at Uhelekawawa Bridge, where coordination of the two project will be required.

No other disruption of public services is anticipated as a result of the proposed action.

4.4 EROSION, SEDIMENTATION AND WATER QUALITY

Little excavation is anticipated during this project. The area of greatest land surface disruption will be near the Lihue Plantation Bridge as a result of approach ramp construction. Minor widening of the existing pavement to create three traffic lanes along Kuhio Highway will occur within the existing right-of-way, which is already developed. Soils in the project area are rated low in erosion hazard (USDA, 1972) and the level slope of the right-of-way will generate little runoff if soil is exposed during the project.

4.5 FLORA AND FAUNA

The project will require minor widening of pavement along the existing Kuhio Highway right-of-way. Along most of the project route, only roadside weeds will be affected. No native flora is present in these areas, and the quality and amount of habitat provided to introduced fauna by roadside weeds is insignificant. The only exception is the stretch of highway which borders Wailua Beach. Backshore vegetation in this section includes several native plants, including naupaka, hau, and hala. Widening the paved highway in this area would require removal of some of this vegetation. No endangered or threatened plant species would be affected, but if backshore vegetation is cut back, it would be desirable to restore a strip of vegetation (with native plants already found in the area).

4.6 LAND USE AND NEIGHBORING PROPERTIES

No additional land acquisition is necessary for this project, which will occur within the existing Kuhio Highway right-of-way. Improvements at intersections with County roads will also occur in the existing right-of-way. It may be necessary, however, to use small portions of neighboring properties for construction activities.

No existing land uses would be forced to relocate as a result of the project, although in a few areas (Papaloa intersection, Waipouli town center) where existing structures crowd the right-of-way, commercial businesses will be closer to traffic after the highway is widened to three travel lanes. Highway widening through the narrow corridor which borders Wailua Beach will mostly involve lands *mauka* of the existing highway and will not require the removal of the rock wall which lines Wailua Beach.

Above-surface and below-surface utility lines will have to be relocated in some areas.

4.7 DEVELOPMENT PLANS

It is generally recognized that provision of enlarged public facilities and roadways may contribute to urbanization and growth. This project will improve traffic on an existing highway which is already heavily traveled and which has already experienced urban development. There are still large properties adjacent to the highway which are in agricultural uses and remain undeveloped. Long-range development of this land would have to conform to State Land Use District and County General Plan and zoning designations.

Urbanization along the project route will be driven by the County's long-range development plans, not by Kuhio Highway improvements. Improvements will continue to be made, however, to keep pace with the traffic needs which are generated as a result of the County's land use planning and development process.

4.8 RECREATIONAL LANDS

No recreational lands would be acquired for this project. Air quality and noise impacts were previously discussed. It is likely that improved air quality due to more efficient traffic flow and possibly reduced noise levels would be positive impacts for recreational activities. Pavement widening and restriping of Kuhio Highway will not alter scenic views. Access to the Wailua River State Park lands and waters would not be impaired. Minor traffic related inconveniences may occur during construction, but these would be short lived.

The Wailua River State Park is considered public recreational land under the definitions of Section 4(f) of the Department of Transportation Act. It does not appear that the Kuhio Highway project would significantly impair or reduce the functions of this recreational facility, and therefore, a Section 4(f) statement is not required.

4.9 ARCHAEOLOGY AND HISTORIC SITES

Kuhio Highway is built over a sub-base which involved excavation of the original ground surface and which presumably disturbed any burial remains near the surface. Yet, there is a possibility that burial deposits still exist under the highway right-of-way. The

project involves minor widening of A.C. pavement and restriping. These improvements will be made within the existing right-of-way, and relatively little excavation is anticipated.

The recommendations (provisional, pending approval of the State Historic Preservation Office) contained in the Cultural Surveys Hawaii (1991) report on subsurface testing for the sewer line project are also appropriate for the highway widening project. Two types of monitoring are specified in the CSH report, but only one of those applies to the sections affected by the road widening project. This is "on-call monitoring," in which the contractor calls an archaeologist and/or the State Historic Preservation Office if findings are discovered.

In developing plans for improvements to the Lihue Plantation Bridge, the DOT will consult with the Historic Preservation Division to determine if any precautions or mitigation measures are necessary to protect its historic value.

4.10 SOCIO-ECONOMIC IMPACTS

Long-term beneficial impacts would include savings of valuable commuter time and increased traffic safety. Also, eliminating stop-and-go conditions during peak flows would result in energy savings as vehicles would operate more efficiently.

4.11 AESTHETICS/VIEWS

Most of the proposed improvements to Kuhio Highway would occur at the existing grade and there should not be any impact on views. The presence of construction equipment during the project may create short-term unsightly conditions, but no unnecessary clearing and grubbing of vegetation will be allowed. Above-surface utility lines will have to be relocated in some areas, and repositioning of telephone poles may alter viewplanes on a small scale.

Existing vegetation along the highway bordering Wailua Beach may be cut back, but the disturbed area will be replanted, preferably with native species already found nearby. Views from Wailua Beach will be temporarily disrupted by the presence of equipment used in the construction of approach ramps and other improvements to the Lihue Plantation Bridge.

4.12 CONSTRUCTION RELATED IMPACTS

4.12.1 Air

Exhaust emissions during construction would be generated from construction machinery. Dust emissions may occur during the construction of approach ramps to the Lihue Plantation Bridge and during the pouring of A.C. pavement. Impacts should be minimized by keeping all equipment properly tuned and maintained, as well as by

minimizing unnecessary idle time. To reduce fugitive dust emissions, exposed surfaces should be kept well watered whenever feasible.

4.12.2 Noise

The operation of construction equipment will raise noise levels in the project vicinity. Construction equipment and on-site vehicles or devices requiring an exhaust of gas or air would have to be equipped with mufflers. In addition, all construction-related vehicles traveling on roadways must meet the vehicle noise level requirements set by the State.

4.12.3 Water Quality

Land disturbance will be minimal during the project, so soil erosion is not expected to be a problem. Potential problems due to soil exposure during construction would be reduced by adherence to the County grading ordinance. Adequate controls would be incorporated on-site, at the potential source of any problems associated with construction. Prompt revegetation of any disturbed sites would provide long-term protection.

4.12.4 Socio-Economic

The construction project would create short-term benefits by providing a temporary source of jobs. Construction would also entail short-term adverse impacts by temporarily disrupting traffic, but this impact could be minimized by limiting construction to off-peak hours. The peak hours would then only be affected by the temporary reduction in the level of service associated with work in progress.

5.0 LIST OF AGENCIES CONSULTED

The following agencies, organizations and individuals were consulted in preparation of the EA.

STATE AGENCIES

Historic Preservation Division, Department of Land and Natural Resources -- Nancy McMahon, Kauai County Archaeologist

Clean Water Branch, Department of Health -- Dan Hori

Office of State Planning --Mary Lou Kobayashi

COUNTY AGENCIES

County of Kauai Public Works Department, Engineering Division -- Kenneth Kitabayashi, CE VI

6.0 PUBLIC INFORMATIONAL MEETING

A public informational meeting concerning this project was held at the Kapaa High School, Kauai, on July 10, 1990.

7.0 LIST OF REFERENCES

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NOTICE OF DETERMINATION
NEGATIVE DECLARATION FOR THE PROPOSED
KUHIO HIGHWAY WIDENING AND RESTRIPING PROJECT

A. Proposing Agency

Highways Division, Department of Transportation (DOT), State of Hawaii

B. Approving Agency

Department of Transportation, State of Hawaii

C. Description of the Proposed Action

The proposed project involves minor widening of sections of Kuhio Highway, pavement restriping, and intersection and bridge improvements to create three travel lanes. These are interim improvements designed to allow contraflow traffic movement and alleviate severe traffic congestion during peak hours of operation. Even with these improvements, projected increases in traffic volume are expected to cause severe congestion in the future along this route, and additional improvements will be required. The DOT is considering a combination of a new by-pass road and further improvements to Kuhio Highway to accommodate future traffic volumes. Specific recommendations will be developed in DOT planning studies.

The location of this project is on the windward (northeastern) side of Kauai, between the entrance to Lydgate Park (Leho Drive) and Waipouli town center (Uhelekawawa Bridge). This section of Kuhio Highway is the major route which links Lihue and Kapaa and is the only highway option for residents who commute to jobs. It is also the major route used by visitors staying at the many hotels in the Wailua-Kapaa corridor and by residents and visitors shopping in the commercial complexes along this corridor.

D. Determination

The proposed action would not have a significant effect on the environment. The "Significance Criteria," Section 12 of Hawaii Administrative Rules Title 11, Chapter 200, "Environmental Impact Statement Rules," were reviewed and analyzed. Based on the analysis, the following were concluded:

1. no irrevocable commitment to loss or destruction of any natural or cultural resource would result;

2. the action would not curtail the range of beneficial uses of the environment;

3. the proposed action does not conflict with the state's long-term environmental policies or goals and guidelines;

4. the economic or social welfare of the community or state would not be substantially affected;

5. the proposed action does not substantially affect public health;

6. no substantial secondary impacts, such as population changes or effects on public facilities, are anticipated;

7. no substantial degradation of environmental quality is anticipated;

8. the proposed action does not involve a commitment to larger actions, nor would cumulative impacts result in considerable effects on the environment;

9. no rare, threatened or endangered species or their habitats would be affected;

10. air quality, water quality or ambient noise levels would not be detrimentally affected;

11. the project would not affect environmentally sensitive areas, such as flood plains, tsunami zones, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters or coastal waters.

E. Reasons Supporting Determination

The Environmental Assessment (EA) for the proposed action, which reflects the results of the public informational meeting of July 10, 1990 and the coordination undertaken with affected agencies and interested parties, is attached to support the determination of a Negative Declaration.

The proposed project primarily involves actions that are included on the Comprehensive Exemption List for the State of Hawaii DOT, as approved by the Environmental Council on November 14, 1990. Among the actions which are generally exempt from requirements regarding preparation of an EA are "Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height and dimensions as the structure replaced" (Exemption Class #2). Actions which are specifically exempted include:

"Upgrade or replace existing roadways...roadway markings and striping, roadway shoulders and curves...to meet acceptable safety standards."

"Reconstruction of an existing highway for safety purposes by widening less than one lane width, adding shoulders, and adding auxiliary lanes for localized purposes...."

"Restriping of existing roadways to provide an additional lane for use of car pools and buses during peak hours."

"Providing a contraflow for car pools and buses during peak hours by coning the opposite direction of travel."

Exemption Class #4 exempts minor alteration in the conditions of land, water, or vegetation, including "Paving of shoulder areas within existing highway rights-of-way for driveways and subdivision street connections."

F. Name, Address and Phone Number of Contact Person

Mr. Edward Y. Hirata
Highways Division
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813
Telephone: 548-3205

CONCURRENCE

By _____ 5/10/91
Date

KUHIO HIGHWAY IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Prepared by:
GK & Associates
for:
Shimabukuro, Endo & Yoshizaki, Inc.

APRIL 1991

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1.0 PROJECT DESCRIPTION

The project location is Kuhio Highway, the only major route connecting towns on the windward (northeastern) side of the island of Kauai (Figure 1). The section between the Lydgate Park entrance (Leho Drive) and Waipouli town center (Uhelekawawa Bridge) is a two-lane highway with some left-turn storage lanes at selected intersections. Several resorts and commercial complexes have been developed along this corridor, and it is the only possible route for residents commuting to jobs in Lihue and Kapaa. Consequently, congestion has worsened as the result of increased traffic volume.

Average daily trips through this corridor are projected to increase from 26,835 in 1989 to 49,800 in 2010 (see Table 1)(Kaku Associates, 1990). The existing highway lacks the traffic carrying capacity to handle present and future peak hour travel demand. The purpose of this project is to provide immediate relief for some of the traffic congestion during peak hours of operation through immediate improvements within the existing Kuhio Highway right-of-way that will facilitate contraflow traffic. Construction would occur in three phases (see Figure 2a-c):

PHASE I

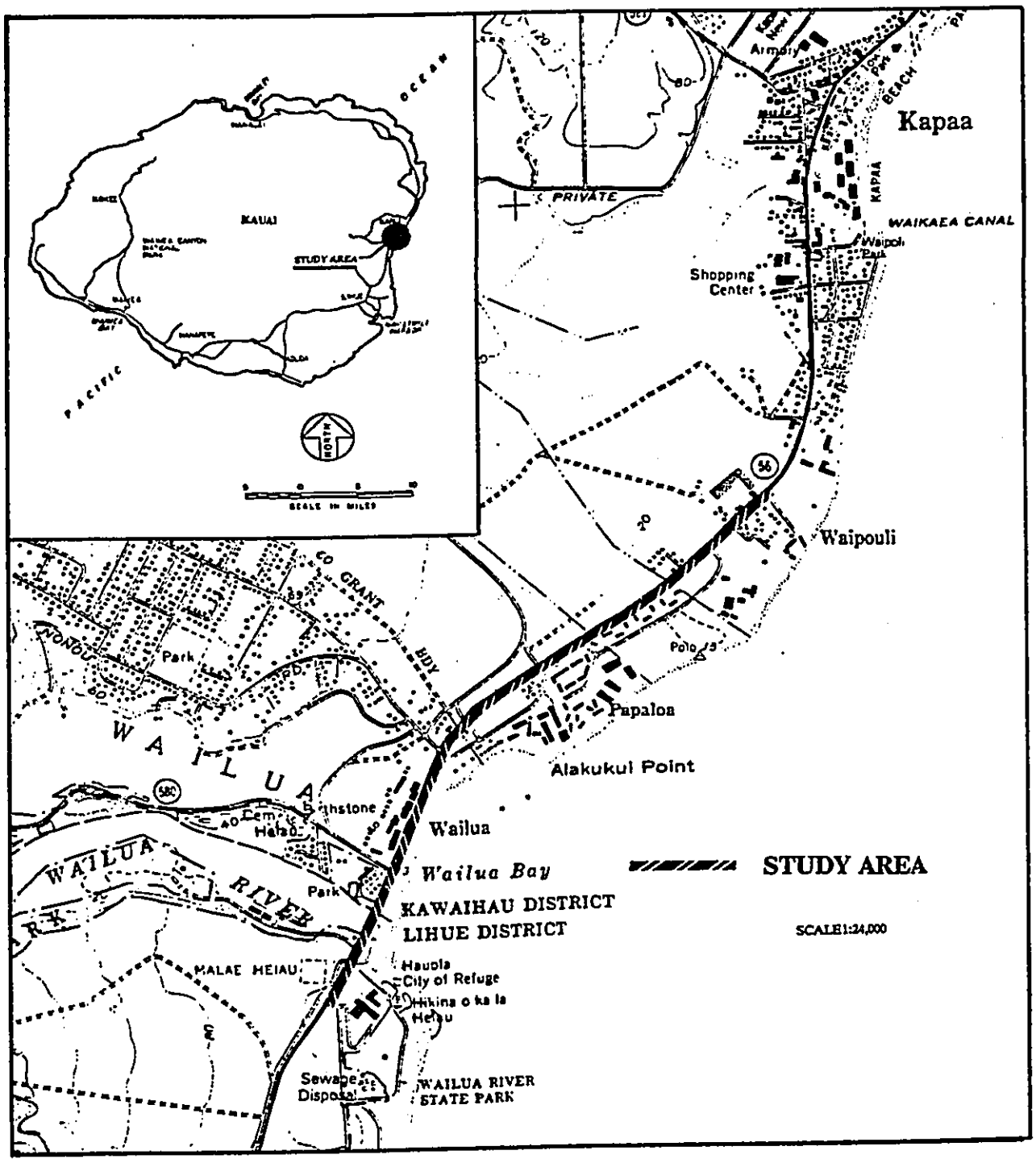
- Create three travel lanes along the 0.9-mile section of roadway between the Lydgate Park entrance (Leho Drive) and Haleilio Road, primarily by restriping but also through minor construction of new pavement within the existing right-of-way.

- Create left-turn storage lanes at the intersections with Leho Drive and Marina Road.

- The existing Wailua Bridge is a two-lane bridge. A third lane will be directed over the existing one-lane Lihue Plantation Bridge and will only be used for Kapaa-bound traffic during the morning and afternoon peak traffic periods. Guardrails and other improvements to the Lihue Plantation Bridge will be constructed, with details to be coordinated with the Lihue Plantation. This bridge was originally designed for trains and is more than capable of bearing one lane of automobile traffic. It has been inspected by DOT engineers.

- A right-turn storage lane will be constructed coming out of Kuamoo Road. New pavement, retaining walls, restriping, modification to the existing traffic signal system, and other miscellaneous improvements will be made at this intersection. All work will be within the existing right-of-way.

FIGURE 1
PROJECT LOCATION



PHASE II

- Create three travel lanes along the 0.9-mile section of roadway between the intersection with Haleilio Road and Uhelekawawa Stream Bridge, primarily by restriping but also through minor construction of new pavement within the existing right-of-way.

- Create left-turn storage and acceleration lanes at selected intersections.

PHASE III

- Widen the existing two-lane Uhelekawawa Stream Bridge. Relocate existing utility lines.

CONTRA-FLOW OPERATION

In 1990, a 2.7-mile length of Kuhio Highway, beginning at the Hanamaulu end of Kapule Highway and ending at Leho Drive, was restriped to create three travel lanes. The proposed project will complete highway widening, restriping, intersection and bridge improvements from Leho Drive to Waipouli so that the entire three-lane route can be utilized for contra-flow traffic operation during peak travel hours.

Two lanes will carry traffic in the Kapaa-bound direction during normal (off-peak) and afternoon peak hours. One lane, with left-turn storage lanes, will carry traffic in the Lihue-bound direction. The Wailua River Bridge crossing will have one lane of traffic in each direction during off-peak and afternoon peak hours. During the afternoon peak, a second lane of Kapaa-bound traffic will be directed over the Lihue Plantation Bridge.

During the morning peak hours, one regular lane and an additional contra-flow lane will carry Lihue-bound traffic and the third lane will carry Kapaa-bound traffic. The two Lihue-bound lanes will cross the Wailua River Bridge and the Kapaa-bound lane will be directed over the Lihue Plantation Bridge.

During the normal (off-peak) hours, the Lihue Plantation Bridge will be closed.

LONGER-TERM IMPROVEMENTS

Even with these improvements, projected increases in traffic volume are expected to cause severe congestion in the future, and additional improvements will be required. Peak a.m. flow through the Wailua-Kapaa corridor is projected to increase by 40% above the present volume by the year 2010, and p.m. peak flow is expected to nearly double during the same period (see Table 1). The DOT is considering a combination of a new by-pass road and further improvements to Kuhio Highway to accommodate future traffic volumes. Specific recommendations will be developed in DOT planning studies.

FIGURE 2a
PHASE I - LEHO DRIVE TO HALEILIO ROAD

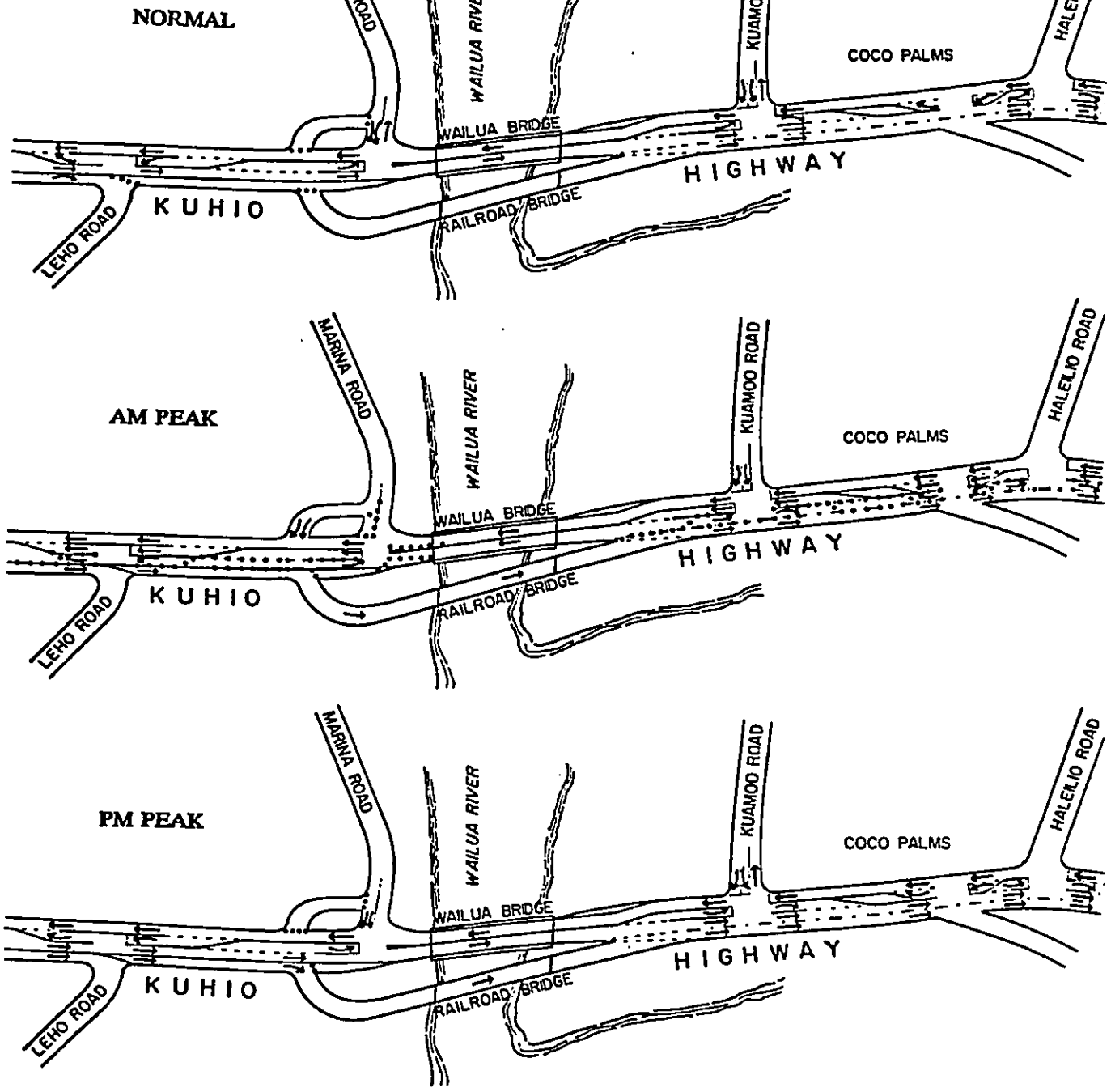


FIGURE 2b
PHASE II - HALEILIO ROAD TO UHELEKAWAWA BRIDGE

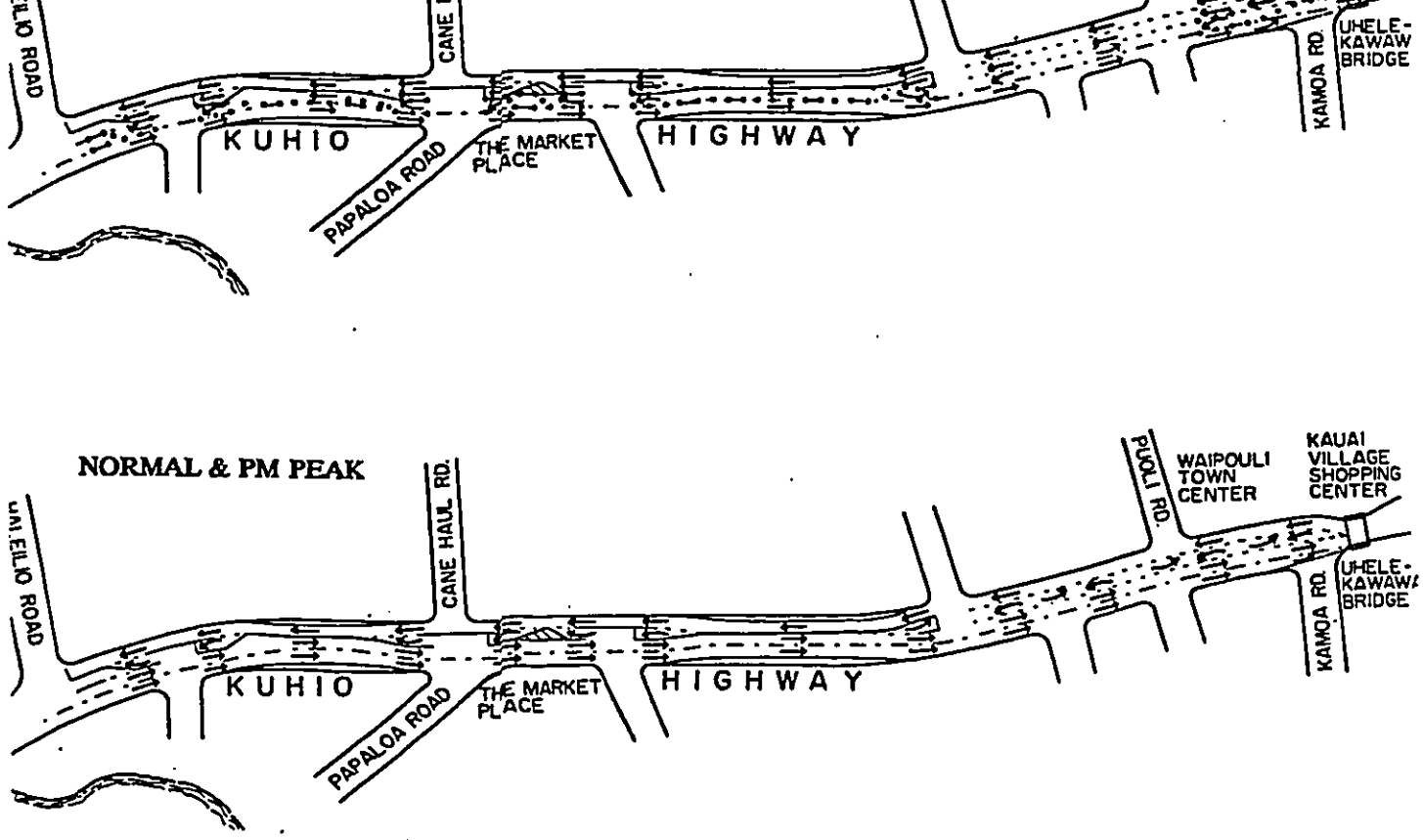
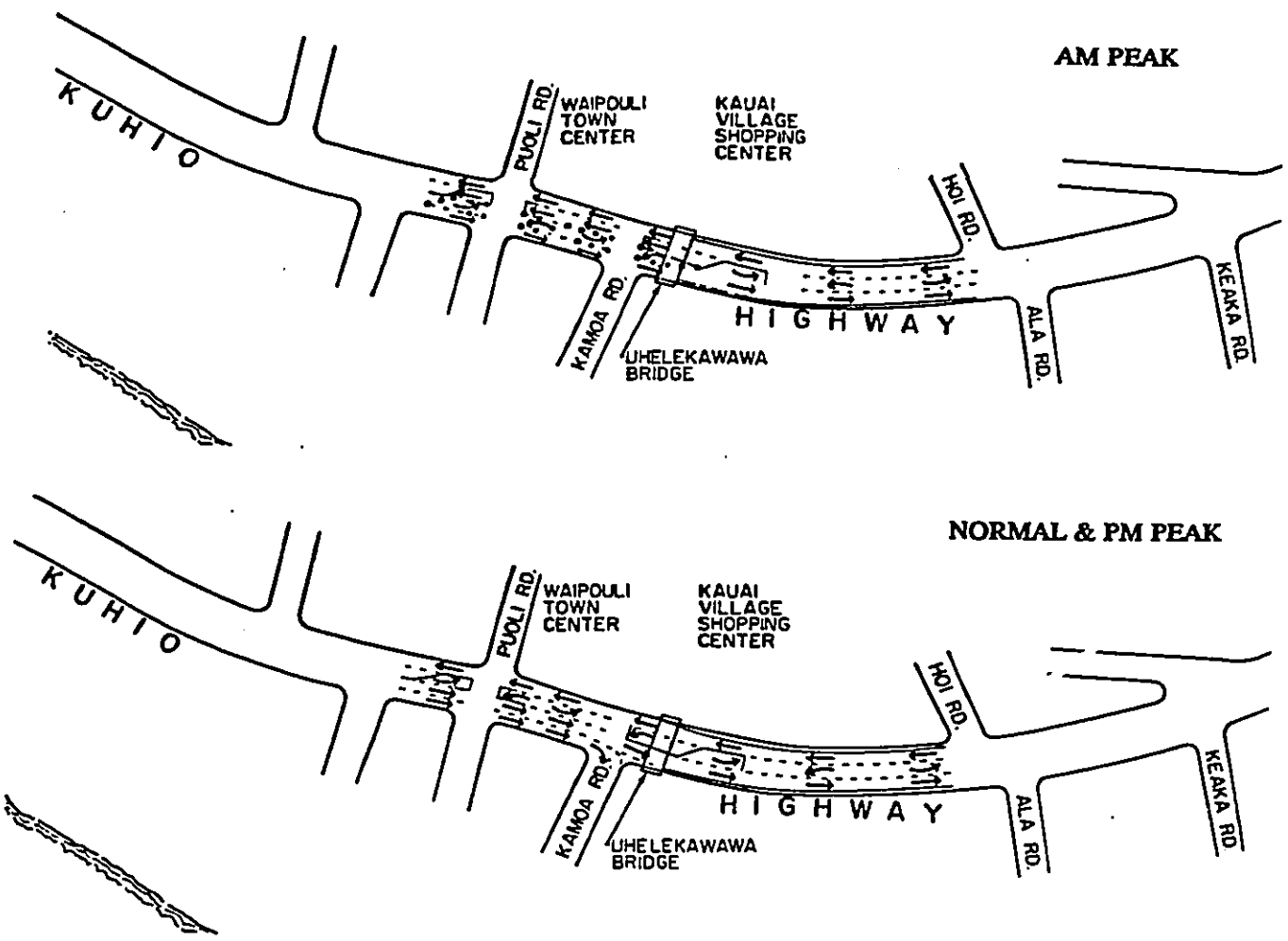


FIGURE 2c
PHASE III - UHELEKAWAWA BRIDGE



2.0 ALTERNATIVES

2.1 ALTERNATIVE A - INTERIM IMPROVEMENTS FOR CONTRAFLOW AND PLANNING STUDIES FOR LONG-TERM IMPROVEMENTS

Alternative A offers immediate relief for the severe peak-hour traffic congestion along the Wailua-Kapaa section of Kuhio Highway. Three travel lanes would be created by a combination of restriping, minor construction of new pavement within the existing right-of-way, and intersection and bridge improvements. One of the lanes would be used for contraflow operation during peak hours.

Contraflow operation alone will not accommodate long-term increases in traffic volume expected through this busy section of Kuhio Highway. The Department of Transportation is considering a combination of a new by-pass road and further improvements to Kuhio Highway. Specific recommendations will be developed in DOT planning studies. No matter what long-term plan is developed, the existing two-lane bridge over Uhelekawawa Stream at Waipouli would be a traffic bottleneck. Widening of this bridge to four lanes with a left turn lane is, therefore, one of the improvements proposed under the present project.

2.2 ALTERNATIVE B - NO INTERIM IMPROVEMENTS; FOCUS ON LONG-TERM IMPROVEMENTS

Alternative B would allocate the available funding to plan, design and construct long-term improvements to Kuhio Highway and perhaps to build a new by-pass road. This alternative assumes that funding diverted for interim improvements for contraflow operation could postpone or jeopardize longer-range improvements which will be needed to cope with projected traffic increases over the next 20 years. P.M. peak flow through the Wailua-Kapaa corridor is expected to nearly double by the year 2010.

The cost of creating a contraflow system along this route is rather small compared to the cost of building a new by-pass road or of acquiring the land necessary for a major widening of the existing Kuhio Highway right-of-way. Long-term improvements do not have to be sacrificed to accomplish interim improvements in traffic flow. For example, the final phase of Alternative A is the widening of a two-lane bridge across Uhelekawawa Stream. This improvement will be essential in any long-range plan for upgrading Kuhio Highway.

2.3 ALTERNATIVE C - TRANSPORTATION SYSTEM MANAGEMENT

In metropolitan areas, several strategies (termed transportation system management or TSM) are possible to achieve more efficient use of existing highways without new construction:

- Improve public transportation

- Encourage flex-time work hours
- Encourage ride-sharing (carpools, van-pools)

Kauai County is currently experimenting with bus service (The Kauai Bus) (TenBruggencate, 1991). Five schedules will be tested through May, 1991. The routes include "The Lihue Express" from Kapaa to Lihue in the morning; "The Kapaa Express" from Lihue to Kapaa in the afternoon; and the Wailua, Lihue and Coconut Coast Shuttles throughout the day.

The worst congestion occurs during the afternoon peak period in the Kapaa-bound direction from Lihue, the major job center on Kauai. Government programs to encourage flex-time hours could alleviate traffic during the afternoon peak to some degree, but there are a large number of businesses from which workers commute. There is no single company large enough to make an impact on traffic flow by implementing flex-time work hours.

Ride-sharing is feasible in high-density areas where neighbors have similar rush hour destinations, or for co-workers who share the same employer. The low population density on Kauai, as well as the distribution of workers among a large number of employers, will continue to discourage this approach.

2.4 ALTERNATIVE D - "NO-ACTION"

The "no-action" alternative would allow traffic congestion along this section of Kuhio Highway to continue to worsen. Time lost by motorists would constitute a negative economic impact. A general erosion of the "Aloha Spirit" of Kauai motorists could be expected as the level of inconvenience rises. The visitor industry could suffer as negative experiences due to traffic congestion are reported. Energy consumption would rise unnecessarily as a result of excessive vehicle idling. The "no-action" alternative is favored by none of the affected or responsible parties.

2.5 THE PREFERRED ALTERNATIVE

Alternative A is preferred because it allows for some immediate relief of traffic congestion while recognizing the need for long-range improvements to meet traffic needs 20 years in the future. Implementation of Alternative A will not sacrifice funding needed for the long term (Alternative B). Non-construction strategies (Alternative C) for improving the efficiency of the existing roadway can continue to be encouraged, but implementation of such strategies will probably have to await higher population densities and more concentrated employment bases on Kauai.

2.6 TENTATIVE PROJECT SCHEDULE

The projected schedule for the three phases is as follows.

PHASE I

Design Completion	1991
Begin Construction	1991
Complete Construction	1992

PHASE II

Design Completion	1991
Begin Construction	1991
Complete Construction	1992

PHASE III

Design Completion	1991
Begin Construction	1992
Complete Construction	1992

2.7 PRELIMINARY COST ESTIMATES

The estimated costs for construction and annual contraflow operations are as follows.

PHASE I

Construction	$900,000
Contraflow Annual Operation	$40,000

PHASE II

Construction	$500,000
Contraflow Annual Operation	$40,000

PHASE III

Construction	$800,000

3.0 SUMMARY DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 EXISTING HIGHWAY AND TRAFFIC

The section of Kuhio Highway between the Lydgate Park entrance (Leho Drive) and Waipouli town center is a two-lane highway with bridges crossing Wailua River and Konohiki Stream. There are left-turn storage lanes at selected intersections. The intersections with Kuamoo Road and Haleilio Road are signalized. The existing volume to capacity ratios (V/C) for a.m. and p.m. peak hours are 1.44 and 1.54, respectively. Both of these ratios correspond to a level of service F, the worst possible condition and indicative of a total breakdown of flow with stop-and-go operation. Although the p.m. peak traffic volume is presently less than the a.m. peak flow (Table 1), the level of service is worse in the p.m. because of vehicles making left-turns from Kuhio Highway at Kuamoo Road and other intersections along this corridor (Table 2).

Hotels and commercial businesses along this route are set back from the roadway except in a few areas where structures crowd the existing highway shoulders and right-of-way. Rock walls bordering Wailua Beach and the Coco Palms Hotel confine the highway along Wailua Bay. Commercial structures are built close to the existing pavement at the intersections with Papaloa and Lanikai Roads, where there are telephone poles in the right-of-way. Commercial structures also crowd the right-of-way in the Waipouli commercial center (near the intersection with Pouli Road). The right-of-way is narrowed across the Wailua River and Konohiki Stream (Uhelekawawa) bridges.

TABLE 1
EXISTING AND PROJECTED TRAFFIC VOLUMES

MEASURE	1989	2010	% CHANGE
Average Daily Trips (ADT)	26,835	49,800	85.6
A.M. Peak	1,388	1,940	39.8
P.M. Peak	1,295	2,530	95.4

Source: Kaku Associates, 1990

The Kauai County Highway Planning Study (Kaku Associates, 1990) examined three intersections in the present study area. Table 2 summarizes the levels of service at those

locations. Improvements to the highways between Lihue and Kapaa were accorded the highest priority of any area on the island.

TABLE 2
INTERSECTION LEVELS OF SERVICE

INTERSECTION	AM	PM
Kuhio Highway at Coconut Plantation	E	F
Kuhio Highway at Haleilio Road	E	F
Kuhio Highway at Kuamoo Road	D	D

Source: Kaku Associates, 1990

There is a moderate amount of pedestrian traffic across Wailua River Bridge, between the Marina and nearby hotels, and between the hotels and Wailua Beach. In most areas, there is ample space off the highway shoulder for safe walking. The pedestrian crossing from the Coco Palms Hotel to Wailua Beach can, however, be dangerous. The most dangerous areas for vehicular and pedestrian traffic are near the Papaloa Road and Waipouli commercial areas, where drivers make left turns into commercial establishments across the Kapaa-bound traffic lane.

Department of Transportation accident statistics for the project area during the period 1986-1988 show that there were 138 accidents involving 272 motor vehicles, one motorcycle, two bicycles and two pedestrians. Most of the accidents (81) involved only property damage, 55 involved some injuries to a total of 83 people, and two accidents resulted in two fatalities.

3.2 GEOLOGY, TOPOGRAPHY AND DRAINAGE

The project route lies mostly within the coastal apron of Koloa Volcanic Series lavas in the Wailua-Waipouli plain, which is characterized by narrow lowlands of alluvium extending inland to dissected hills of old lavas which mark the now-collapsed eastern flank of the original shield volcano. Thin layers of alluvium cover coastal sand deposits in most areas, but thick sedimentary material overlies the Waipouli area (Takasaki, 1977).

The Wailua River drains an area of about 53 square miles and discharges perennially into Wailua Bay, a drowned stream valley formed during a lower stand of the ocean. The other major perennial channel is Konohiki Stream, which splits into two branches upon

reaching the coastal plain. The southern branch drains a 3.5 square mile area, crossing under Uhelekawawa Bridge. The lower 2.5 miles of this channel has been realigned (Timbol and Maciolek, 1978). Only stream flow which rises above the crest gaging station at the bridge reaches the ocean. The northern branch angles toward Kapaa, discharging into the ocean through the Waikaea Canal.

Extremely heavy rainfall and stream runoff can cause flooding at the bridges crossing both streams, but is a less probable occurrence at the Wailua River Bridge. Sand deposits at the head of Wailua Bay commonly bar discharge from the river.

The coastal plain of windward Kauai is subject to tsunami flooding. The tsunami of 1957 caused flooding to elevations of 10-14 feet along the project route (Loomis, 1976). In most areas, the highway lies well below the 20-foot elevation.

3.3 SHORELINE AND NEARSHORE

Wailua Beach extends north from the mouth of Wailua River for approximately 2,500 feet. The north end of the beach is more stable than the south end, which terminates at the mouth of the Wailua River and which is subject to erosion when the river floods. The 100-foot wide beach is bounded at both ends by lava outcrops (Moberly, et al., 1963; U.S. Army Corps of Engineers, 1971).

The submerged valley of Wailua River has largely been filled with sediment to form shallow Wailua Bay (Cox and Gordon, 1970). The bay is exposed to strong tradewind-generated waves. Offshore areas consist primarily of sand deposits, in some areas overlying beachrock formations (Moberly, et al., 1963).

The shorelines of Papaloa and Waipouli are almost totally developed with resort complexes that line the narrow to moderately wide sandy beach extending from Wailua. Permanent beach erosion has occurred in several areas, evidenced by a number of seawalls and groins constructed to prevent further loss of beachfront property. The offshore bottom is moderately shallow and primarily rocky, but sandy pockets along the shoreline provide ocean access. Several beach sections are fronted by narrow outcrops of beachrock that are emergent at low tide (AECOS, 1982).

3.4 SOILS

There are four major soil types along the project route. At the head of Wailua Bay, Kuhio Highway borders a narrow strip of sandy soil (Jaucas soil series) along the backshore of Wailua Beach. The alluvial plain at the mouth of the Wailua River and in the area between the Market Place and Waipouli is characterized by fine sandy loam (Mokuleia series). Areas north of the Wailua River mouth to the Market Place have gently sloping silty clays (principally of the Lihue soil series) which formed from erosional topography of the island's original shield volcano. Silty clays that are more stony (Koloa soil series)

predominate immediately south of the Wailua River adjacent to the Wailua River Bridge and the Lihue Plantation Bridge.

All of these soil types are well drained, and their erosion hazard is slight (USDA, 1972).

3.5 HYDROLOGY AND WATER QUALITY

The project area receives an average annual rainfall of 50 inches, the majority during the October-March period.

Wailua River and Konohiki Stream are the only perennial channels in the project area. The lower reaches of Wailua River are estuarine (tidally influenced) where the river crosses the coastal plain into Wailua Bay. A sand bar extending from Wailua Beach commonly restricts the mouth of the river, ponding stream flow in a large "muliwai" behind the sand deposits. Water in the muliwai under the Wailua River Bridge and Lihue Plantation Bridge is restricted in circulation. Trade winds mix the upper few inches of ponded water, but sub-surface waters had a distinct green appearance at low tide (0') on March 3, 1991. This suggests high nutrient concentrations and high phytoplankton productivity.

Surface runoff from drainage areas north of the Wailua River is intercepted in upland areas for sugarcane irrigation. A few smaller, intermittent channels cross the project area.

Koloa Volcanic Series lavas carry many discontinuous perched-water bodies which seep to the surface at upper elevations and carry basal water near the coast where lavas extend below sea level. Basal groundwater is locally important for domestic well supply (Takasaki, 1977). The County of Kauai plans to connect the Kapaa-Waipouli area to a sewage treatment plant in the Lydgate Park area which already services the Wailua area. Treated effluent is pumped to sea through an outfall extending 600 feet from shore to a 30-foot depth.

The sewer project will eliminate many of the cesspools and injection wells in the Kapaa-Waipouli area, which have been a source of concern about coastal water quality along this coast (Takasaki, 1977). Coastal waters fronting the Wailua-Kapaa coast are classified "A" for purposes of State Department of Health water quality regulations.

The Department of Health has recently initiated sampling for bacterial concentrations at two locations, in Wailua River behind Wailua Beach Park and offshore of the beach park in marine waters. The data indicate a potential public health hazard in both the Wailua River and Wailua Beach Park recreational areas.

3.6 FLORA AND FAUNA

Existing vegetation along the margins of Kuhio Highway, within the project area, is mostly introduced grasses, weeds, shrubs and sugar cane largely adapted to frequent roadside disturbances. The major exception is along the highway margin fronting Wailua Bay, where low backshore dunes are vegetated by a mixture of tree heliotrope (*Messerschmidia agentea*), ironwood (*Casuarina* sp.), hala or screwpine (*Pandanus odoratissimus*), beach naupaka (*Scaevola taccada*), and koa haole (*Leucaena leucocephala*). The native plants along this section of roadside are not listed as threatened or endangered species.

A plantation of coconut palms (*Cocos nucifera*) borders both sides of Kuhio Highway just north of the Market Place.

Roadside environments vegetated by introduced grasses and shrubs or sugarcane provide some degree of habitat for the typical array of exotic birds and mammals that one would expect at coastal elevations and in this type of environment throughout the island.

A dense overgrowth of hau (*Hibiscus tiliaceus*) lines the banks of the Wailua River along much of its lower reaches. The shores of the river drop steeply towards the center. The lowest flatland along Wailua River, once a tidal marsh, was modified considerably in the 1960's by the construction of a tropical botanical garden containing seven shallow ponds. A portion of the undeveloped marshlands can still be found adjacent to the botanical garden. The various wetland areas in the Wailua River bottomland provide a diversity of habitat for waterbirds, especially the gallinule (*Gallinula chloropus sandvicensis*)(Ahuimanu Productions, 1977).

Wailua River and Konohiki Stream have been evaluated as having an ecological rating of III: moderate to low natural and/or water quality (well exploited, modified or degraded). The stream fauna of the lower reaches of Wailua River are primarily exotic species, especially small mouth black bass (*Micropterus dolomieui*)(Timbol and Maciolek, 1978).

3.7 ARCHAEOLOGY AND HISTORICAL SITES

The Wailua area is rich in archaeological remains, including major heiau, mostly in the Wailua Valley between the coast and the 200-foot elevation. The heiau complex in the vicinity of Wailua State Park has been recognized by the U.S. National Park Service as a National Historic Landmark. The complex consists of 5 discontiguous properties: Hikinaakala Heiau (including Haola, a sacred place of refuge, and several petroglyph boulders in Wailua River), Malae Heiau, Holoholoku Heiau and Pohaku Hoohanau, Poliahu Heiau and the Bellstone. These features are described by Dunbar (1988). None are in the Kuhio Highway right-of-way.

Nearest the project area are Malae Heiau, in a cane field inland of the highway on the south side of Wailua River, and Hikinaakala Heiau, in the Lydgate Park area seaward of the highway along the south bank of the Wailua River. Approximately 130 feet north of Hikinaakala Heiau are a series of petroglyphs that are visible at low tide on river boulders.

The Kuhio Highway right-of-way crosses an area of concern to archaeologists because of the possibility of ancient burials. Burial deposits along the backshore at Waipouli (site #1836, State Historic Preservation Division) may extend inland as far as Kuhio Highway, near its intersections with Puoli Road and Kamoa Road. Portions of this area have been developed for residential and commercial uses, but if there were no large-scale disturbance of existing topography, deposits may still exist under the developed areas and the highway right-of-way.

The County of Kauai plans to install a sewer line beneath Kuhio Highway from Kapaa to Wailua State Park, where the sewage treatment plant is located. The results of the archaeological survey for that project (Cultural Surveys Hawaii, 1991) are directly relevant to the highway project, and are summarized here with the kind permission of Dr. Hallett H. Hammatt, Principal Archaeologist, Cultural Surveys Hawaii (CSH).

In the CSH survey, thirteen backhoe trenches and 15 hand-dug trenches were excavated within the alignment of a proposed sewerline along Kuhio Highway from the Wailua Sewage Treatment Plant south of the Wailua River Bridge to Kapa'a Town, an area encompassing the entire study area for this environmental assessment. CSH divided the area into seven segments, four of which are of relevance here. The paragraphs below summarize the CSH findings in the segments of interest to this assessment.

Section 1: Leho Drive to Wailua Bridge. Most of the sediment near the bridge is modern fill placed for bridge and highway construction. The Leho Drive area has been heavily modified by resort and highway construction. The area was formerly used for sugar cane cultivation. All sediments are clay loam alluvial deposits and archaeological sensitivity is low.

Section 2: Wailua Bridge to Papaloa Road. A backhoe trench to the north of Wailua Bridge showed an abandoned roadbed east of the present bridge. Eight hand-dug trenches dug *makai* of the road berm (where the sewer line is planned) all showed modern beach sand with no cultural layer below the modern A Horizon. Despite the absence of a cultural layer, there is the possibility in this section of locating burials in natural shoreline sand deposits. The archaeological sensitivity of this segment is rated moderate.

Section 3: Papaloa Road Between its Southern and Northern Intersections With Kuhio Highway. The weathered clay loam soils and alluvium comprising an ancient lava flow were formerly used for cane cultivation. The archaeological sensitivity is low as a result of the heavy terrestrial soils and

extensive impact of cultivation.

Section 4: Kuhio Highway from Papaloa Road to Konohiki (Waipouli) Stream. This section is similar to Section 2 in that modern A Horizons overlay beach sand, and no buried cultural layers were found. Again, despite the probability that the area has been heavily disturbed in modern times, the possibility of uncovering isolated burials remains, and the archaeological sensitive of this section is rated moderate.

The Lihue Plantation Bridge was constructed as a railroad bridge in 1932, but has been modified to accommodate vehicular traffic.

3.8 LAND USE AND DEVELOPMENT PLANS

The land corridor which borders the Kuhio Highway project area is developing rapidly. Present land uses include:

- RESORT (Kauai Aston, Coco Palms, Coconut Plantation)
- PUBLIC RECREATION (Lydgate Park, Wailua River State Park, Wailua Beach)
- COMMERCIAL (complex of convenience stores, restaurants, shopping village at Haleilio Road intersection; the Market Place; Waipouli commercial complex)
- AGRICULTURE (sugarcane, pasture north of Haleilio Road intersection to Coconut Plantation)
- RESIDENTIAL (scattered houselots along main highway north of Haleilio Road intersection and in Waipouli; higher-density buildings on side roads east of the main highway in Waipouli).

State and County land use classifications provide an indication of future development potential in the area. The land bordering the Kuhio Highway project area is classified as Urban under the State Land Use Law except that the land beneath the Wailua River is classified Conservation.

The 1982 Kauai General Plan Update (Planners Collaborative, et al., 1982) describes the area as Resort along the shore and Public Facilities, Open, Urban Residential and Agriculture inland of Kuhio Highway.

The Kapaa Wailua Development Plan (LMNI, 1973) indicates a mixture of residential, resort, commercial, special treatment-public, and open along this section of Kuhio Highway.

As a State highway, the right-of-way itself does not have a tax map key number (TMK). The TMKs of parcels adjacent to the highway in the area of the proposed

improvements are as follows: 3-9-02:13,21,28; 3-9-04:6; 3-9-06:12,16; 4-1-03:7,17,39,44; 4-1-04:5,6,7,8,20; 4-1-05:3,4,5,7,8,9,14,17,21; 4-3-01:1,5,6,7,8,9,14,19; 4-3-02:6,8,17,18; 4-3-06:1,2,3,7; 4-3-07:3,4,14,16,17,18,19,22,26,27,29,30; and 4-3-08:1,2,9,14.

3.9 RECREATIONAL LANDS

The entire Wailua River area is one of exceptional interest from geological, archaeological, historical, aesthetic and recreational points of view. The Wailua River State Park comprises 1,113 acres, with over half of the acreage in reserve. The remaining lands, situated primarily on the banks near the river mouth at Wailua Beach, support a variety of developed commercial, recreational, and historical sites that receive heavy usage from both tourist and local populations. These sites include Lydgate State Park, the Wailua River Marina, the Wailua River State Park - Kaumuali'i Area, and the Wailua Complex of Heiau (*AECOS, 1982*).

The Wailua River Marina provides a center for the commercial activity taking place on the Wailua River, often called the only navigable river in the state. Excursion boats carry visitors from the marina to the headwaters of the South Fork estuary and a fern grotto nearby (Grace, 1974). In addition to providing docking space and support facilities for the excursion boats, the marina offers a variety of concessions, a restaurant, and ample parking.

Located directly across the river from the marina, the Kaumuali'i area of the park provides access to the river for the general public with a boat ramp, parking for automobiles and trailers, and a small park for picnickers. Boaters launch here usually to fish or water ski in the river, which is navigable for several miles upstream. A shallow sand bar usually prevents any vessels, except those with very shallow drafts, from entering the ocean, even at high tide (Grace, 1974). The sandbar occasionally disappears for short periods of time, usually after several days of heavy rain which results in the river flooding and eroding away all of the sand at its mouth. Jet skiers and outrigger canoe paddlers also use the river for practicing and racing (AECOS, 1982).

Wailua Beach, with its constant shorebreak spread out over a lengthy, shallow sandbar, is a popular destination for tourists from the surrounding resort complexes. The Coco Palms Hotel is situated directly across Kuhio Highway from the beach. A beach concession offers a variety of rental equipment for aquatic activities. The most popular pastimes at Wailua Beach in addition to sunbathing and swimming, are bodysurfing, bellyboarding, and board surfing (AECOS, 1982).

Sand deposits block the Wailua River mouth during dry periods, closing the channel to the ocean and ponding stream flow in a large "muliwai" which extends under the Kuhio Highway bridge. The sand bar is periodically dredged to clear a channel to the ocean.

The section of beach between Papaloa and Waipouli attracts tourists for swimming, sunbathing and strolling. Local fishermen also visit this area for shorecasting and sometimes

for skindiving when the ocean is calm and underwater visibility is good. There are public rights-of-way to the ocean off Papaloa Road and off Kuhio Highway (AECOS, 1982).

3.10 AESTHETICS/VIEWS

Kuhio Highway affords excellent views of the ocean where it crosses Wailua River and borders Wailua Bay. The road is shielded from ocean views where it turns inland at Waipouli, but views of the Nonou Ridge ("Sleeping Giant") are unobstructed along the entire project route. The coconut plantation on both sides of Kuhio Highway north of the Market Place is another scenic point along the Waipouli portion of the project route.

4.0 IMPACTS AND MITIGATING MEASURES

4.1 AIR QUALITY

The rural environment of windward Kauai and exposure to tradewinds maintains good circulation and air quality. There is no reason to believe that carbon monoxide from vehicle exhaust emissions is presently a problem. This project is expected to improve the traffic flow rate, not increase the total volume. Total emissions should remain the same or decrease due to more efficient traffic movement, therefore mitigation measures are not necessary.

4.2 NOISE

The most sensitive receptor locations for traffic noise are resorts and recreational sites along the project route where there is outdoor activity. Most of the resorts are set back from the highway and are shielded by vegetation. The hotel closest to the road (Coco Palms) is well buffered by vegetation. Rush hour traffic can be heard in the hotel's driveway and parking areas but is not noticeable inside the complex. Wailua Beach is likewise well buffered by vegetation planted along the roadside, and this tends to mitigate the impact of traffic noise. Restaurants and shops which are close to the right-of-way near the intersections with Papaloa Road and in Waipouli are enclosed, so traffic noise does not affect their customers. The Kuhio Highway improvements are expected to change the traffic flow rate but not the total volume.

In most areas, noise levels should remain the same or decrease with more efficient traffic movement. Stop-and-go traffic is generally more noisy that free-flowing traffic, especially when heavy vehicles are a significant proportion of the vehicle mix.

4.3 UTILITIES AND PUBLIC SERVICES

Telephone/electric poles are close to the existing pavement near the Wailua River and fronting Wailua Beach and they are inside the paved right-of-way at the Papaloa and Lanikai Road intersections and in the Waipouli town center. Planned for relocation are the

following:

- Kuamoo Road - 2 each
- Kuamoo/Kuhio intersection - 1 each
- Those along Kuhio Highway between Haleilio Road and Uhelekawawa Bridge

The widening of Uhelekawawa Bridge will require relocation of underground utilities.

The County of Kauai is planning to install a sewer line under Kuhio Highway from Kapaa to the sewage treatment plant at Lydgate Park. Pavement widening and restriping along this route will not affect the design or schedule of the sewer project, except perhaps at Uhelekawawa Bridge, where coordination of the two project will be required.

No other disruption of public services is anticipated as a result of the proposed action.

4.4 EROSION, SEDIMENTATION AND WATER QUALITY

Little excavation is anticipated during this project. The area of greatest land surface disruption will be near the Lihue Plantation Bridge as a result of approach ramp construction. Minor widening of the existing pavement to create three traffic lanes along Kuhio Highway will occur within the existing right-of-way, which is already developed. Soils in the project area are rated low in erosion hazard (USDA, 1972) and the level slope of the right-of-way will generate little runoff if soil is exposed during the project.

4.5 FLORA AND FAUNA

The project will require minor widening of pavement along the existing Kuhio Highway right-of-way. Along most of the project route, only roadside weeds will be affected. No native flora is present in these areas, and the quality and amount of habitat provided to introduced fauna by roadside weeds is insignificant. The only exception is the stretch of highway which borders Wailua Beach. Backshore vegetation in this section includes several native plants, including naupaka, hau, and hala. Widening the paved highway in this area would require removal of some of this vegetation. No endangered or threatened plant species would be affected, but if backshore vegetation is cut back, it would be desirable to restore a strip of vegetation (with native plants already found in the area).

4.6 LAND USE AND NEIGHBORING PROPERTIES

No additional land acquisition is necessary for this project, which will occur within the existing Kuhio Highway right-of-way. Improvements at intersections with County roads will also occur in the existing right-of-way. It may be necessary, however, to use small portions of neighboring properties for construction activities.

No existing land uses would be forced to relocate as a result of the project, although in a few areas (Papaloa intersection, Waipouli town center) where existing structures crowd the right-of-way, commercial businesses will be closer to traffic after the highway is widened to three travel lanes. Highway widening through the narrow corridor which borders Wailua Beach will mostly involve lands *mauka* of the existing highway and will not require the removal of the rock wall which lines Wailua Beach.

Above-surface and below-surface utility lines will have to be relocated in some areas.

4.7 DEVELOPMENT PLANS

It is generally recognized that provision of enlarged public facilities and roadways may contribute to urbanization and growth. This project will improve traffic on an existing highway which is already heavily traveled and which has already experienced urban development. There are still large properties adjacent to the highway which are in agricultural uses and remain undeveloped. Long-range development of this land would have to conform to State Land Use District and County General Plan and zoning designations.

Urbanization along the project route will be driven by the County's long-range development plans, not by Kuhio Highway improvements. Improvements will continue to be made, however, to keep pace with the traffic needs which are generated as a result of the County's land use planning and development process.

4.8 RECREATIONAL LANDS

No recreational lands would be acquired for this project. Air quality and noise impacts were previously discussed. It is likely that improved air quality due to more efficient traffic flow and possibly reduced noise levels would be positive impacts for recreational activities. Pavement widening and restriping of Kuhio Highway will not alter scenic views. Access to the Wailua River State Park lands and waters would not be impaired. Minor traffic related inconveniences may occur during construction, but these would be short lived.

The Wailua River State Park is considered public recreational land under the definitions of Section 4(f) of the Department of Transportation Act. It does not appear that the Kuhio Highway project would significantly impair or reduce the functions of this recreational facility, and therefore, a Section 4(f) statement is not required.

4.9 ARCHAEOLOGY AND HISTORIC SITES

Kuhio Highway is built over a sub-base which involved excavation of the original ground surface and which presumably disturbed any burial remains near the surface. Yet, there is a possibility that burial deposits still exist under the highway right-of-way. The

project involves minor widening of A.C. pavement and restriping. These improvements will be made within the existing right-of-way, and relatively little excavation is anticipated.

The recommendations (provisional, pending approval of the State Historic Preservation Office) contained in the Cultural Surveys Hawaii (1991) report on subsurface testing for the sewer line project are also appropriate for the highway widening project. Two types of monitoring are specified in the CSH report, but only one of those applies to the sections affected by the road widening project. This is "on-call monitoring," in which the contractor calls an archaeologist and/or the State Historic Preservation Office if findings are discovered.

In developing plans for improvements to the Lihue Plantation Bridge, the DOT will consult with the Historic Preservation Division to determine if any precautions or mitigation measures are necessary to protect its historic value.

4.10 SOCIO-ECONOMIC IMPACTS

Long-term beneficial impacts would include savings of valuable commuter time and increased traffic safety. Also, eliminating stop-and-go conditions during peak flows would result in energy savings as vehicles would operate more efficiently.

4.11 AESTHETICS/VIEWS

Most of the proposed improvements to Kuhio Highway would occur at the existing grade and there should not be any impact on views. The presence of construction equipment during the project may create short-term unsightly conditions, but no unnecessary clearing and grubbing of vegetation will be allowed. Above-surface utility lines will have to be relocated in some areas, and repositioning of telephone poles may alter viewplanes on a small scale.

Existing vegetation along the highway bordering Wailua Beach may be cut back, but the disturbed area will be replanted, preferably with native species already found nearby. Views from Wailua Beach will be temporarily disrupted by the presence of equipment used in the construction of approach ramps and other improvements to the Lihue Plantation Bridge.

4.12 CONSTRUCTION RELATED IMPACTS

4.12.1 Air

Exhaust emissions during construction would be generated from construction machinery. Dust emissions may occur during the construction of approach ramps to the Lihue Plantation Bridge and during the pouring of A.C. pavement. Impacts should be minimized by keeping all equipment properly tuned and maintained, as well as by

minimizing unnecessary idle time. To reduce fugitive dust emissions, exposed surfaces should be kept well watered whenever feasible.

4.12.2 Noise

The operation of construction equipment will raise noise levels in the project vicinity. Construction equipment and on-site vehicles or devices requiring an exhaust of gas or air would have to be equipped with mufflers. In addition, all construction-related vehicles traveling on roadways must meet the vehicle noise level requirements set by the State.

4.12.3 Water Quality

Land disturbance will be minimal during the project, so soil erosion is not expected to be a problem. Potential problems due to soil exposure during construction would be reduced by adherence to the County grading ordinance. Adequate controls would be incorporated on-site, at the potential source of any problems associated with construction. Prompt revegetation of any disturbed sites would provide long-term protection.

4.12.4 Socio-Economic

The construction project would create short-term benefits by providing a temporary source of jobs. Construction would also entail short-term adverse impacts by temporarily disrupting traffic, but this impact could be minimized by limiting construction to off-peak hours. The peak hours would then only be affected by the temporary reduction in the level of service associated with work in progress.

5.0 LIST OF AGENCIES CONSULTED

The following agencies, organizations and individuals were consulted in preparation of the EA.

STATE AGENCIES

Historic Preservation Division, Department of Land and Natural Resources -- Nancy McMahon, Kauai County Archaeologist

Clean Water Branch, Department of Health -- Dan Hori

Office of State Planning --Mary Lou Kobayashi

COUNTY AGENCIES

County of Kauai Public Works Department, Engineering Division -- Kenneth Kitabayashi, CE VI

6.0 PUBLIC INFORMATIONAL MEETING

A public informational meeting concerning this project was held at the Kapaa High School, Kauai, on July 10, 1990.

7.0 LIST OF REFERENCES

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