



## EXECUTIVE CHAMBERS

HONOLULU

JOHN WAIHEE  
GOVERNOR

August 5, 1992

Honorable Rex D. Johnson, Director  
Department of Transportation  
869 Punchbowl Street  
Honolulu, Hawaii 96813-5097

Dear Mr. Johnson:

SUBJECT: Final Environmental Impact Statement for  
the Kahului Airport Master Plan Update

I am pleased to accept the Final Environmental Impact Statement for the Kahului Airport Master Plan Update as satisfactory fulfillment of the requirement of Chapter 343, Hawaii Revised Statutes. This environmental impact statement will be a useful tool in the process of deciding if the action described therein should be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws and does not constitute an endorsement of the proposed action.

When the decision is made regarding the proposed action itself, I expect the appropriate legislative bodies and governmental agencies to consider if the societal benefits justify the economic, social and environmental impacts which will likely occur. These impacts are adequately described in the statement, and together with the comments made by reviewers, provide useful analysis of the proposed action.

With kindest regards,

Sincerely,

A handwritten signature in black ink, appearing to read "John Waihee".

JOHN WAIHEE

cc: Mr. Brian J.J. Choy

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**FINAL ENVIRONMENTAL IMPACT STATEMENT  
KAHULUI AIRPORT MASTER PLAN UPDATE**

**KAHULUI, MAUI, HAWAII**

**JULY 1992**



**GOVERNOR JOHN D. WAIHEE**

**STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
AIRPORTS DIVISION**

**PACIFIC PLANNING  
ENGINEERING, INC**

**FINAL ENVIRONMENTAL IMPACT STATEMENT**

**KAHULUI AIRPORT MASTER PLAN UPDATE**

**KAHULUI, MAUI, HAWAII**

**JULY 1992**

**Prepared For:  
State Of Hawaii  
Department Of Transportation  
Airports Division**

**Prepared By:  
Pacific Planning & Engineering, Inc.  
1221 Kapiolani Boulevard, Suite 740  
Honolulu, Hawaii 96814**

**FINAL ENVIRONMENTAL IMPACT STATEMENT**

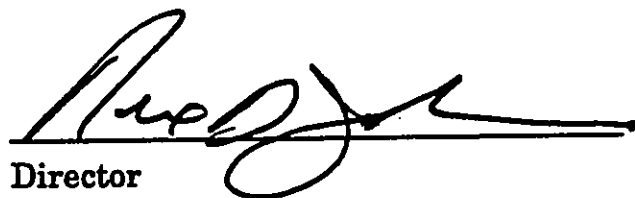
**KAHULUI AIRPORT MASTER PLAN UPDATE**

**KAHULUI, MAUI, HAWAII**

**JULY 1992**

This Environmental Impact Statement is submitted for acceptance pursuant to Chapter 343, Hawaii Revised Statutes.

Submitted By:



Director  
State of Hawaii, Department of Transportation

7-17-92  
Date

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## 1.0 INTRODUCTION AND SUMMARY

### 1.1 INTRODUCTION

This Environmental Impact Statement (EIS) describes the probable environmental effects of the various airport improvements recommended by the Kahului Airport Master Plan Update Study between now and 2010. Within this context, it describes with particularity the probable environmental effects of five (5) actions that may be undertaken within the next five years that require Federal Aviation Administration (FAA) approval. Those five actions are identified in Section 1.4, Proposed Action. The five year time frame is the reasonable foreseeable limitation required for actions submitted to the FAA for its approval.

The EIS has been prepared pursuant to the Hawaii Environmental Impact Statement Law - Chapter 343, Hawaii Revised Statutes; and Title 11, Chapter 200, of the State Department of Health Administrative Rules. It is intended to comply fully with the requirements of such state statutes and regulations. Guidance was provided by FAA Order 5050.4A, Airport Environmental Handbook, particularly with respect to noise impacts. Such guidance was useful in two respects. This EIS is not, in and by itself, intended to comply with the National Environmental Policy Act, 42 U.S.C. Section 4321, et seq. (NEPA). The FAA advised us, in response to its review of the Draft EIS (DEIS) and its own internal requirements, that the format and purpose of the EIS did not warrant formal Federal cooperation and participation at this time. By utilizing FAA Order 5050.4A, Airport Environmental Handbook, however, we sought to assure as full an analysis as possible comparable to Federal requirements. This comparability, as well as recognition of the FAA's five year time frame, allows the State of Hawaii, Department of Transportation, Airports Division (DOT) - upon acceptance of the EIS - to consider the appropriate timing and form for seeking FAA approval and compliance with NEPA.

The EIS contains the following information and descriptions: (1) the purpose of the Proposed Action; (2) the Proposed Action (including the five actions proposed with the next five years that require FAA approval); (3) the alternatives studied; (4) the existing environmental conditions; (5) the probable environmental impacts which could result from the Proposed Action; (6) the potential mitigation measures which could be employed to minimize potential adverse impacts; (7) the unresolved issues; and (8) the relationship of the Proposed Action to existing airport planning, land use plans, policies, and controls.

## 1.2 SUMMARY

### Proposing and Lead Agency:

State of Hawaii  
Department of Transportation  
Airports Division  
Honolulu International Airport  
Honolulu, Hawaii 96819

### Accepting Authority:

John Waihee, Governor  
State of Hawaii

### Project Location:

Kahului Airport, Maui, Hawaii

### Tax Map Keys:

3-8-1: 3, 4, 5, 15, 19, 23, 24, 73, 134, 135, and 166  
3-8-1: por. 2, 7, 8, 14, and 16  
3-8-2: 3-10, 33, 34, 41, 44, 47, 49, 68, 72, 80-84, and 93  
3-8-6: por. 4 and 7

### Project Area:

Approximately 2,138 acres

### 1.3 PURPOSE OF THE PROPOSED ACTION

DOT is in the process of updating the Kahului Airport Master Plan. This EIS is intended to serve as an informational and analytical base in that process. The Master Plan Update Study identifies the improvements that DOT believes are needed to meet its objective of providing safe, efficient, economical and convenient transportation facilities, while mitigating significant environmental impacts.

The purpose of the improvements recommended in the Master Plan Update Study and in this EIS is to insure that safe, efficient, economical, convenient, air transportation facilities are available to the residents of, and visitors to, Maui through the year 2010 and to recognize and safely accommodate technological and policy changes concerning aircraft development, Federal noise requirements, and the airline industry. Moreover, in order to attain this purpose in a reasoned fashion consistent with the FAA's procedural and approval requirements, including compliance with NEPA, the improvements essential within the next five years that require FAA approval are specifically identified.

### 1.4 PROPOSED ACTION

The Master Plan Update Study recommends the following actions through the year 2010:

- Extend existing Runway 2-20 (future 2L-20R) to a total length of 9,600 feet.
- Construct an 8,500 foot long runway parallel to Runway 2-20 (2R-20L).
- Construct a parking apron for large transient aircraft.
- Construct a new Airport Access Road.
- Provide new general aviation facilities.
- Provide new scenic air tour facilities.
- Provide commercial aviation/fixed based operator facilities.
- Provide new air cargo facilities.

- Relocate helicopter facilities.
- Provide additional ground transportation facilities.
- Provide space for new commercial development, including flight kitchen facilities.
- Provide new fuel storage and delivery facilities.
- Provide improvements to Kanaha Beach Park.
- Provide other support improvements (e.g. infrastructure, navigational aids, on-site roads, etc.) as necessary.

These actions are recommended to be undertaken in phases. See Section 3.5 Description of Proposed Action. In order to comply with the FAA's requirements on procedure and timing, as described above, and in light of the substantive information deduced throughout the entire EIS process as described herein, the DOT is recommending to undertake the following five actions that require FAA approval within the next five years:

- Extend existing Runway 2-20 (future 2L-20R) to a total length of 9,600 feet.
- Strengthen existing Runway 2-20
- Construct a new Airport Access Road.
- Provide essential technical support improvements i.e., navigational aids and related infrastructure.
- Acquire the land necessary to accomplish these actions only.

No construction will be initiated on these five recommended actions until a formal proposal is made to the FAA, there is compliance with NEPA and related federal requirements, and FAA approval is obtained.

## 1.5 ALTERNATIVES STUDIED

### NO-ACTION ALTERNATIVE

This alternative evaluates the probable impacts if the improvements, particularly the actions recommended within the next five years that require FAA approval and are described in Section 1.4, are not implemented. Under this alternative, the existing passenger terminal building, Runway 2-20, Keolani Place, utilities and various facilities for general aviation, scenic air tour, air cargo, ground transportation, and fueling facilities would remain unchanged.

DOT believes that the increased number of passengers forecast for Kahului Airport is likely to be achieved without further airport improvements. It also acknowledges, based on the comments received and subsequent analysis, that there is sufficient concern over the extent to which passenger and visitor volumes might be lower without the improvements to warrant evaluating two No-Action Alternatives in the Final EIS. Accordingly, the Final EIS studied a Base No-Action Scenario and a Constrained No-Action Scenario. Both are explained and summarized below.

#### *Base No-Action Scenario (Use of SASP Forecasts)*

The Hawaii Statewide Airport System Plan (SASP), dated December 1990, presents forecasts for passengers, air cargo and mail, aircraft operations, and based aircraft for all of the airports in the State. Based on these forecasts, it recommends the aviation facilities needed to meet the long-term demands of the State through 2010. The SASP annual forecast for Kahului Airport for the year 2010 is 9,059,000 passengers.

The DEIS concluded that limiting the Airport to the two existing runways (7,000 foot long Runway 2-20 and 4,990 foot long Runway 5-23) and terminal facilities would not prevent the increased number of passenger forecast for Kahului Airport (SASP) from being realized. Accordingly, the Final EIS uses the SASP annual forecast for Kahului Airport for the year 2010 of 9,059,000 passengers as the Base No-Action Activity Level. The use of the relatively high SASP forecasts is believed to be reasonable and prudent because it will insure that: (1) adequate airport facilities are planned for; and (2) the level of activity whose impacts are evaluated in the EIS is unlikely to be exceeded.

*Constrained No-Action Scenario (Use of Reduced SASP Forecasts)*

There was general agreement that the SASP forecast figures constituted a reasonable upper limit for the No-Action Scenario. Establishing the low end forecast of passenger for the "No-Action" (Constrained No-Action Scenario) was more difficult. Some insights were provided by a report entitled "Airport Expansion, Direct Flights, and Consumer Choice of Travel Destinations: The Case of Hawaii's Neighbor Islands," prepared by University of Hawaii Department of Economics professors Edwin Fujii, Eric Im and James Mak in February, 1991. The specific question addressed by the study was the extent to which the availability of "direct" flights between the Mainland and Maui, Kauai and Hawaii influenced the total number of visitors to those islands. (Note that the term "direct flights" included non-stop flights from neighbor islands (including Maui) to the Mainland, one-stop same-plane service through Honolulu, and same-airline/change-of-plane service through Honolulu; the study did not distinguish between these).

The report concludes that up to 9 percent more visitors may now be coming to Maui than would be the case if there were no "direct" flights between Maui and the Mainland. Using the same analytical techniques, it concludes that the initiation of "direct" flights between the Mainland and Kauai and Hawaii Islands produced a substantially smaller effect on visitor arrivals on those islands (2 and 3 percent, respectively). A critical assumption made by the researchers was that the improvement in airline service was the only significant factor that might have altered visitors' choice of travel destinations in the Hawaiian visitor market (i.e., whether they would visit the neighbor islands or would stay only on Oahu) that occurred during the study period.

The University study has several significant limitations as an indicator of the possible differences between visitor levels with and without a longer runway at Kahului Airport. These limitations include the following: (1) the institution of direct Maui-Mainland flights was not associated with any improvements to airport facilities; (2) the assumption that the higher visitor arrivals observed following the initiation of direct flights to Maui was attributable solely to those direct flights is questionable; (3) unlike the situation the University studied, the change currently under consideration is one which would simply increase the number of Mainland cities that could be served with non-stop flights; and (4) although the runways at Honolulu International Airport are long enough to give airlines complete freedom of choice to Mainland destinations, approximately 75 percent of these Mainland flights operate through West Coast gateways.

It appears certain that only a small part of the growth in passenger traffic forecast in the SASP could be attributed to longer runways. Most of the evidence suggests that if there is an effect, it would be on the order of a few percent or less. Even if all of the increased visitor traffic observed following the initiation of direct mainland service in 1983 was attributable to that service (rather than to the many other factors at work), and even if expanding the number of Mainland cities served by non-stop flights had as great an effect as did the original service, the "Constrained No-Action" passenger volumes would be no more than 10 percent below the level of the

"Base No-Action Scenario."

Hence, for the purpose of the Final EIS, it was decided to include a sensitivity analysis of the secondary and other impacts that could be attributable to a runway extension to 9,600 feet if passenger volumes without it were 10 percent lower than those forecast in the SASP. Accordingly, the Final EIS uses 8,153,000 passengers as the Constrained No-Action Activity Level for the year 2010. It is considered extremely unlikely that the difference attributable to airport improvements would reach or exceed this level. Nonetheless, the scenario was included as a means of identifying the environmental impacts that might be attributable to Airport improvements if they did, in fact, result in higher passenger volumes.

#### PROPOSED ACTION

The Proposed Action evaluates the probable impacts if the improvements - that require FAA approval - described in Section 1.4 were implemented. These recommended improvements include, within the next five years: (1) strengthening existing Runway 2L-20R to accommodate wide-bodied aircraft including DC-10, L-1011, B-767, B-757 and MD-11 aircraft with fewer payload restrictions; (2) extending the runway to 9,600 feet, (3) constructing a new Airport Access Road; (4) providing essential technical support improvements, particularly navigational aids and related infrastructure; and (5) acquire the land necessary to accomplish these actions.

International Arrivals Facilities would not be constructed within the planning horizon of the Master Plan Update Study (2010). In addition, although it is recommended that a new 8,500 foot runway parallel to existing Runway 2L-20R be constructed between the year 2000 and 2010, such an action will be properly and further examined at the appropriate time and in accordance with all applicable Federal laws. See also Section 3.5 Description of the Proposed Action for descriptions of other recommended improvements.



1.6 SUMMARY OF IMPACTS AND MITIGATION MEASURES

GEOLOGY, SOILS AND AGRICULTURAL LANDS

Recommended airport improvements with the potential to affect agricultural lands are the Airport Access Road, extension to existing Runway 2-20, improvements to the area adjacent to the East Ramp, and a parallel runway. The 691 acres of agricultural lands that would be acquired would eventually be permanently withdrawn from sugar cane production if the improvements are built. According to the State Department of Agriculture, the withdrawals, would be permanent and irreversible, and over time, would have a negative cumulative effect upon agricultural resources.

Although Alexander & Baldwin, Inc. (A & B) has long-term plans to convert approximately 340 acres of its land near the Airport from Agriculture to Industrial and other Urban uses, they have indicated that the withdrawal of 691 acres from cultivation is significant to their sugar operations. DOT is expected to lease back any property it acquires from A & B until the land is needed for actual construction. The lease back arrangements would enable A & B time to undertake an orderly transition from its current sugar operations and to productively use its land until construction starts.

Grading would be required for the extension of Runway 2-20 and the parallel runway, and filling for the expansion of the ground transportation subdivision along Keolani Place and air cargo facilities. Only the construction of the parallel runway is expected to significantly alter drainage at the Airport.

## GROUND, SURFACE WATER AND DRAINAGE

The Proposed Action is not expected to contribute significant amounts of nutrients to ground or surface waters. A new drainage outlet to serve the parallel runway could degrade water quality slightly in the vicinity of the new outlet. A detailed environmental assessment evaluating the potential effects of the additional outlet will be prepared and processed if and when a decision is made to develop the parallel runway.

To prevent fuel spills from draining into Kalialinui Channel, DOT implemented a storm drainage system for the ramp area composed of a dual-level fuel catchment system designed to effectively "catch" such spills. The catchment system is maintained in accordance with a regular schedule. The development of additional on-site fuel storage facilities would include berms and impermeable membranes that would keep petroleum products that accidentally escaped from the storage tanks from contaminating soil or groundwater. In addition, a concrete drainage channel separates the proposed fuel storage area from Kanaha Pond and provides positive protection against the spread of contaminants into the Pond. A detailed environmental assessment for these fuel storage facilities and fuel lines (from the storage facilities to the passenger terminal apron) will be prepared when specific plans are available.

## NATURAL HAZARDS

The Proposed Action would not increase the magnitude or frequency of earthquakes. Proposed facilities will be designed to resist the stresses that can reasonably be anticipated in accordance with established building standards.

New facilities susceptible to flood damage will be situated outside the Kalialinui Gulch and other existing floodways. However, several proposed actions are within the coastal high hazard area identified on the map. These include the Kanaha Beach Park Improvements, the transient aircraft parking apron, the relocated VORTAC, portions of the new cargo

area access road, and a few taxiway segments. None of these projects would involve a high concentration of people, and can be designed to minimize adverse structural effects from a tsunami.

The Alahao Street/Old Stable Road Emergency Access connection would provide a major improvement in the event of a natural hazard such as a tsunami by providing alternative routes for evacuation of the area. It would also serve as a bypass road for vehicular traffic in the event flooding occurs along Hana Highway.

### VISUAL ATTRIBUTES

Under both the Base and Constrained No-Action Scenarios, there would be no impact to the existing visual qualities of identified visual resources. Overall, the Proposed Action should have minor impacts to existing visual resources identified near Kahului Airport. The most important visual resources should retain their existing high visual qualities. The main impacts are expected to be the open space area around the Airport and line of trees at the intersection of Hana Highway with Kala Road. The Airport Access Road's proposed interchange with Hana Highway may decrease the visual quality of the mauka view of Haleakala from the highway between Kaahumanu Avenue and the interchange location.

To minimize the visual impacts to the line of trees along Kala Road, the remaining trees located mauka of the highway will be preserved and those needing to be removed could be relocated next to the remaining trees. Appropriate landscaping and providing an open space buffer between Hana Highway and the parallel runway will be implemented to mitigate the removal of existing agricultural land serving as an open space visual resource. Airport facilities will be constructed with appropriate setback distances to minimize view obstructions from internal roadways such as Keolani Place. Further, these improvements will be appropriately designed and landscaped to minimize its view within the surrounding environment and visual sight lines.

### TERRESTRIAL FLORA

No officially listed threatened and endangered plants were found at the Airport. Although no significant diminishment of native species will occur, an effort will be made to mitigate their loss by cultivating their growth elsewhere on the site. Almost all of the remaining vegetation within the areas being considered for development has been disturbed at one time or another. The Proposed Action may involve the loss of some of this existing vegetation. However, no significant negative impacts are expected because the vegetation consists primarily of introduced species. The few native vegetation species found on the site occur throughout the islands in similar environmental conditions. The probable impacts of ground and surface waters is discussed in Section 5.2, and the introduction of plant pests and animals is discussed in Section 9.5.

### TERRESTRIAL FAUNA

The Proposed Action does not include extending Runway 5-23 and does not infringe upon the 50 meter vegetation buffer and thereby minimizes noise and other disturbances to bird habitats. The Proposed Action is not expected to increase noise levels at the Pond compared to the No-Action Alternatives.

The four new facilities that would be nearest to Kanaha Pond (i.e., bulk fuel storage facility, flight kitchen facility, ground transportation subdivision facilities, and lease lots) will be designed and constructed to contain leaks and to minimize storm water runoff. In addition, three of the facilities would be separated from Kanaha Pond by an existing concrete drainage ditch that would impede the underground movement of spilled fuel towards Kanaha Pond.

## HISTORICAL AND ARCHAEOLOGICAL RESOURCES

The majority of the areas surveyed (undertaken in cooperation with the State Historic Preservation Office and identified in Section 6.3) did not contain significant historic or cultural resources. The extension of existing Runway 2L-20R to 9,600 feet is not expected to have any impact on archaeological resources. The land is former sugar cane land and has been heavily altered with repeated plowing for commercial agriculture.

The new 8,500 foot runway parallel to existing Runway 2L-20R would be constructed between 2000 and 2010. No archaeological sites are expected to be found in the runway portion of the parallel runway because the land is either abandoned or presently cultivated sugar cane fields. The northeast end of the parallel runway protection zone near the homes in East Spreckelsville probably contain archaeological sites which will need to be investigated further.

Moreover, implementation of the Proposed Action will require the preparation of an Historic Sites Mitigation Plan to ensure its conformance with all applicable State, County, and Federal regulations concerning historic sites.

## NOISE

Future traffic noise levels are expected to be high in the residential areas fronting Kuihelani Highway and the sections of Dairy Road near Puunene Avenue regardless of whether or not the Proposed Action is implemented at Kahului Airport.

The Proposed Action is expected to increase traffic noise levels by 0.4 to 0.5 dB along Kuihelani Highway, but traffic noise levels along Dairy Road and Keolani Place are expected to decline by 1.5 to 3.9 dB due to the transfer of airport traffic to the new Airport Access Road.

The Proposed Action along with a 8,500 foot runway parallel to Runway 2L-20R constructed between the years 2000 and 2010, are expected to significantly increase noise levels (7 Ldn) in Puunene. In the East Spreckelsville area, a significant increase in noise level (up to 4 Ldn) is expected to occur with a 8,500 foot parallel runway. The increase in noise levels at both Puunene and East Spreckelsville may be mitigated by increasing the sound attenuation treatments such as thicker glass windows, insulating roofs and exterior walls, and adding air conditioning. As stated at the outset, however, such consequences will be subject to further review at the appropriate time and consistent with the applicable laws.

#### CLIMATE, METEOROLOGY AND AIR QUALITY

Implementation of the Maui Long-Range Transportation Plan is expected to improve traffic flow and lessen air quality impacts due to ground traffic. In general, ground transportation improvements which bring about an increase in speeds and a lower vehicle queue length will tend to lessen air quality impacts for the same traffic volumes moving at slower speeds and queuing for longer times.

Under both the Base and Constrained No-Action Scenarios, no violations of the Hawaii State or National Ambient Air Quality Standards (NAAQS) are forecast. The average annual impacts for the Constrained No-Action Scenario would be approximately 10 percent lower than the Base No-Action Scenario. With the Proposed Action, no violations of the Hawaii State or NAAQS are also forecasted since the maximum one-hour air quality impacts are the same as for the No-Action Alternatives.

Since no violations of the Hawaii State or NAAQS are expected for vehicular and aircraft traffic, no special mitigation measures are considered to be necessary.

## SOCIO-ECONOMIC FACTORS

Under the No Action Alternatives, there would be no land acquisition resulting in the displacement of existing land uses. Up to 50 percent of the projected increase in general aviation local (training) operations would be discontinued because of the increased air traffic reducing opportunities for career advancements as commercial pilots. Under the Constrained No Action Scenario, there would be eleven percent less passenger activities occurring at Kahului Airport than for the Base No Action Scenario. There would also be eight percent less visitor arrivals for Maui Island which translates into approximately 6,500 fewer visitors daily.

By the year 2010, Maui County will not have the facilities needed to support the level of forecasted activity based on the amount of predictable resort development. Over 3,100 visitor units will be needed in addition to what is already existing and proposed and is 6,000 units for the Base No Action Scenario. The projected level of passenger traffic for both No-Action Alternatives will not be realized if the visitor facilities and resort workers do not exist to meet the needs of projected visitors.

With the Proposed Action, agricultural land would need to be acquired for the Airport Access Road, the extension of Runway 2L-20R, and the construction of a new parallel Runway 2R-20L and connecting taxiways affecting Alexander and Baldwin, Inc. Spreckelsville homeowners in the 60 Ldn contour may have the option of selling their properties to the State or receiving sound attenuation treatment for their homes under the FAR Part 150 Noise Compatibility Program. However, some of those property owners electing to receive sound attenuation treatment under the FAR Part 150 Noise Compatibility Program could be displaced by the 8,500 foot parallel runway.

The parallel runway and supporting taxiways would allow the level of general aviation operations forecast to be accommodated at Kahului Airport and not impact the future opportunities for career advancements as commercial pilots.

The increased passenger activity forecast under the Proposed Action could result in up to 9,400 more jobs for Maui County. The number of annual construction jobs generated was estimated to be 232 jobs per year producing a total annual income of \$9,397,000. Regardless of the level of airport improvements, Maui County's population would need to grow by between 35,000 to 52,400 persons to provide the labor force necessary to provide and support the estimated demand for visitor units.

The DOT will follow the requirements specified in the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended for any displacement of property owners resulting from the proposed project. This law provides for expeditious negotiation in the acquisition of real property, relocation benefits, payment for moving expenses, and replacement housing payment. The DOT is required to fully inform affected parties of the full requirements and entitlements under this law.

Other socio-economic factors and effects are identified and summarized in the Sections on Police and Fire Protection Services (Section 8.7), Health Care Facilities (Section 8.8), Recreational Facilities (Section 8.9), and Educational Facilities (Section 8.10).

#### GROUND TRANSPORTATION

Traffic volumes in the vicinity of the Airport are expected to increase whether or not the Proposed Action is implemented. The projected traffic volumes at the three signalized intersections studied would exceed the existing intersections' operational capacity. Generally, the Level-of-Service (LOS) for vehicle turning movements at unsignalized intersections studied decreases due to longer delays caused by higher traffic volumes. Ramp analyses conducted for the Airport Access Road interchange with Hana Highway indicate the ramps and freeway would generally operate at LOS D or better during the morning and afternoon peak hours.



Traffic impacts resulting from increased volumes due to regional growth, which includes airport-related traffic, could be mitigated in various ways. Two possible methods are as follows:

1. Non-Diversion of Traffic - Increase capacity to fully meet the projected traffic volumes at the study intersections by adding laneage and/or traffic signals.
2. Diversion of Traffic - As traffic volumes increase, motorists could choose to divert to lesser used or proposed routes which would lessen the amount of improvements to the existing regional highway system.

### HARBORS

The expected increase in resident, visitor and Airport activities will increase activity at the Harbor. Increased fuel needs for Airport and non Airport-related activities will increase the need for fuel barge shipments and increase the potential for fuel spills during shipping and at the Harbor. The increased number of fuel barges entering Kahului Harbor will create additional demand for a fixed number of berthing spaces. The expected increase in visitors through the Airport should result in a similar increase in rental car operations, thereby increasing the volume of rental cars arriving/departing from Kahului Harbor. If Kahului Harbor is unable to store the increased number of rental cars, the rental cars could be stored outside of the Harbor area.

The Proposed Action is expected to increase airline fuel consumption and number of fuel barges by 14 percent, but not increase the volume of rental cars in the Harbor area under the Base No-Action Scenario. Compared to the Constrained No-Action Scenario, airline fuel consumption and number of fuel barges may increase by up to 21 percent, and the volume of rental cars in the Harbor area may increase by up to ten percent with the Proposed Action.

The amount of non Airport-related activity at the Harbor would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in non Airport-related activity at the Harbor would occur.

#### WATER SUPPLY

Kahului Airport's water usage is projected to increase from 0.3 million gallons per day (mgd) in 1991 to 0.6 mgd in 2010 under the Base No-Action Scenario, and 0.54 mgd under the Constrained No-Action Scenario.

The Proposed Action is not expected to increase water demand (Base No-Action Scenario). Compared to the Constrained No-Action Scenario, water demand may increase by up to 0.06 mgd with the Proposed Action. Water demand would not change significantly for on-Airport flight kitchen and commercial development facilities because these facilities could have been provided off-Airport and supplied with essentially the same amount of water under the No-Action Alternatives.

The water demand outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in water demand outside of the Airport would occur.

#### WASTEWATER TREATMENT AND DISPOSAL

Sewage generated by Kahului Airport's operations is projected to increase from 0.25 mgd in 1991 to 0.5 mgd in 2010 under the Base No-Action Scenario, and 0.45 mgd under the Constrained No-Action Scenario. The Wailuku-Kahului Wastewater Reclamation Facility is currently being expanded to 7.9 mgd, which should accommodate the increased sewage

from Airport operations.

The Proposed Action is not expected to increase sewage (Base No-Action Scenario). Compared to the Constrained No-Action Scenario, sewage may increase by up to 0.05 mgd with the Proposed Action. Sewage would not change significantly for on-Airport flight kitchen and commercial development facilities because these facilities could have been provided off-Airport under the No-Action Alternatives and generated the same amount of sewage.

The amount of sewage generated outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in sewage generated outside of the Airport would occur.

#### SOLID WASTE COLLECTION AND DISPOSAL

Solid waste generated by Kahului Airport's operations is projected to increase from 3.5 tons per day (tpd) in 1991 to 6.5 tpd in 2010 (one percent of the daily solid waste generated by commercial activities on Maui) under the Base No-Action Scenario, and 5.7 tpd under the Constrained No-Action Scenario. It is expected that private disposal companies will handle the increase in Airport solid waste, and the County collection system will therefore not be affected.

The Proposed Action is not expected to increase solid waste (Base No-Action Scenario). Compared to the Constrained No-Action Scenario, solid waste may increase by up to 0.8 tpd with the Proposed Action. The amount of solid waste generated would not change significantly for on-Airport flight kitchen and commercial development facilities because these facilities could have been provided off-Airport under the No-Action Alternatives and generated the same amount of solid waste.

The amount of solid waste generated outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in solid waste generated outside of the Airport would occur.

#### POWER AND COMMUNICATIONS

The addition of Holdrooms C - F (currently in progress) and the recently completed new baggage claim area will increase electrical power consumption by an additional 477,000 kilowatt hours (KWH) per month under the Base No-Action Scenario. Under the Constrained No-Action Scenario, the Airport facilities would be the same and the amount of electricity used should be relatively the same (i.e., 477,000 KWH per month). Maui Electric Company's (MECO) Kanaha Substation #2 has sufficient capacity to accommodate the increased demand.

The Proposed Action is expected to increase electrical demand slightly due to additional airfield lighting and navigational aids for both the Base and Constrained No-Action Scenarios. The amount of electrical demand would not change significantly for on-Airport rental car, flight kitchen and commercial development activities because these facilities could have been provided off-Airport under the No-Action Alternatives and used the same amount of electricity.

According to Hawaiian Telephone, the Airport has sufficient capacity to accommodate the communication requirements for the Proposed Action.

The electrical demand and need for telephone services outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in electrical demand and need for telephone services outside of the Airport would occur.

## POLICE AND FIRE PROTECTION SERVICES

The Proposed Action is not expected to increase the need for police protection services compared to the Base No-Action Scenario, except during construction of the proposed projects if in-migration of construction workers occurs. Compared to the Constrained No-Action Scenario, the need for police protection services may increase due to the increase of up to 17,000 residents and up to 6,500 additional visitors per day by 2010.

The total number of aircraft operations is projected to increase from 177,803 aircraft operations in 1989 to 306,000 aircraft operations in 2010 for the Proposed Action. Based on the increase in number of aircraft operations, the Proposed Action may increase the need for fire protection services by up to 14 percent under the Base No-Action Scenario. Compared to the Constrained No-Action Scenario, the need for County fire protection services may increase by up to 21 percent with the Proposed Action.

The need for police and fire protection services outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in police and fire protection services outside of the Airport would be needed.

## HEALTH CARE FACILITIES

The Maui Hospital system currently has numerous problems which hamper the efficient delivery of medical services that are unrelated to the Airport and Airport operations. Unless these problems are addressed, the expected increase in residents and visitors will further strain the delivery of medical services.

In addition, the forecast increase in the number of aircraft operations will increase the potential for aircraft emergencies and the corresponding need for emergency medical services. The Proposed Action would increase the length of Runway 2L-20R to 9,600 feet in order, among other purposes, to enhance safety in the immediate and long-term. Regarding the potential for a major aircraft emergency involving more than 200 passengers, the projected number of daily DC-10 and L-1011 type aircraft operations is the same for the Proposed Action and the Base No-Action Scenario. Compared to the Constrained No-Action Scenario, up to eight more daily DC-10 and L-1011 type aircraft operations may occur with the Proposed Action.

A Rapid Deployment Team (RDT) comprised of emergency physicians, nurses, and paramedics is currently available to respond to emergencies at the Airport. Increased support for Maui Memorial Hospital and the RDT will assist in meeting current and future medical requirements.

The need for medical services outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in medical services outside of the Airport would be needed.

#### RECREATIONAL FACILITIES

Under both the Base and Constrained No-Action Scenarios, there should be no impacts to the existing access of recreational facilities. The projected number of daily visitors to Kanaha Beach Park and Spreckelsville Beach are expected to increase congestion which would further aggravate existing problems. Windsurfers would continue to comprise the majority of visitors at both beach parks. Under the Constrained No Action Scenario, a decrease of about 20 people on weekdays and 40 people on weekends could occur at both parks. This difference should not result in a major change in the expected problems and level of congestion occurring.

The Proposed Action should not result in major changes to the level of congestion and activity occurring at beach parks due to additional visitors discussed above. The new parallel runway and connecting taxiways would not result in major impacts to fishing and diving activities in the area associated with occasional runoff from the new drainage outlet at Spreckelsville Beach. Under the Proposed Action, the Kanaha Beach Park improvement would increase the amount of developed park land accessible for public use and alleviate some congestion associated with parking, picnic tables, and facilities. The remaining airport projects proposed would not eliminate existing access to recreational facilities available for the public.

Adequate facilities should be provided with the proposed Kanaha Beach Park improvements to help alleviate some of the congestion. However, this improvement may not be enough to meet the future demand, thus, additional developed park areas should be planned for along the western shoreline of Kanaha Beach Park. The County of Maui should work with the State Department of Transportation in pursuing the potential expansion of Kanaha Beach Park along this shoreline. A Shoreline Recreational Plan that is being prepared should be incorporated into the future planning and development of the shoreline area.

#### EDUCATIONAL FACILITIES

Under both the Base No-Action Scenario and the Proposed Action, approximately 4,000 students more would be added to the school system based upon the estimated 13,000 additional housing units required by the year 2010. Under the Constrained No-Action Scenario, approximately 2,100 students would be added to the school system. Therefore, with the Proposed Action, up to 1,900 more students could be added compared to the Constrained No-Action Scenario.

To mitigate the increased level of student enrollments on Maui projected in the year 2010, additional school facilities will need to be provided beyond what is currently planned for. In planning for future school facilities, the State Department of Education's projections should be incorporated to ensure the proper planning and phasing of school facilities to meet changing demographics and community needs.

#### OPERATIONAL AND OTHER ISSUES

##### Runway 2L-20R Length Of 7,000 Feet

A review of DOT's Aircraft Rescue and Firefighting records (1982-1990) determined that four aircraft crashes occurred at Kahului Airport during the nine year period. None of the four crashes were related to insufficient runway length.

The Airline Pilots Association does believe, however, that Runway 2L-20R should be lengthened to a minimum of 8,500 feet to "enhance the safety aspect of (current) air operations." The Proposed Action would increase the length of Runway 2L-20R to 9,600 feet in order, among other purposes, to enhance safety in the immediate and long-term.

##### Aircraft Rescue and Firefighting

Overseas passengers are forecast to increase from 1,081,411 passengers in 1989 to 2,377,000 passengers in 2010 which will increase the number of wide-bodied jets (e.g. DC-10, L-1011). ARFF personnel believe they have adequate equipment to handle a wide-bodied jet emergency, but may not have sufficient manpower for certain emergencies such as passenger rescue at the Airport. DOT is attempting to increase its Kahului Airport ARFF staff.



### Interisland Travel

Regarding the effects of the cost of the Proposed Action on interisland airfares, DOT operates and maintains 14 State airports as a single integrated system for financial purposes. Historically, the Neighbor Island airports, including Kahului Airport, have received subsidies from the Airports System as a whole, and this policy is expected to continue. According to a recent Airport Bond Prospectus, airline costs per enplaned passenger for the Statewide Airports System is forecast to be considerably higher than current costs due to the large capital improvement program planned for all State airports and the forecast reduction in duty free revenues. The increased airline costs could result in increased airline fares.

### Introduction of Plant Pests and Animals

New pests have become established in Hawaii at a steady rate of 20 new pests per year. Agriculture officials believe increases in statewide air traffic and cargo will increase the potential for introduction of such pests. Increases in the number of direct overseas flights from the U.S. mainland to Maui will increase the potential for direct and "quicker" pest introductions to Maui. Over a period of time, however, a large number of pests are eventually transported to and become established on other neighbor islands.

The State Department of Agriculture's (DOA) report to the 1989 State Legislature commented on the potential impacts of newly established harmful pests or animals:

"The establishment of a new crop pest can result in higher produce prices, lower produce quality, greater pesticide usage, increased concern over pesticide residues in the environment, or individuals giving up farming, to name a few. The establishment of an illegal harmful animal could endanger the public or affect the quality of our "outdoors" way of life."

In addition to agricultural lands, important natural areas such as Kanaha Pond and Haleakala National Park could be affected.

The State DOA has developed several recommendations to mitigate this problem and to strengthen their inspection program with more effective equipment and procedures. In addition, the State Legislature has authorized additional inspection personnel. DOT also should consider funding assistance to the existing Federal and State inspection programs to ensure adequate resources are available to meet the anticipated growth in inspection service requirements.

Runway 2L-20R Closure

Runway 2L-20R could be closed periodically for normal or emergency maintenance, construction, or an aircraft accident. The new 8,500-foot parallel runway, projected for the year 2000 to 2010, would provide valuable backup capability that would allow the Airport to continue most of its normal operations (e.g., passenger and cargo flights) without serious disruptions with the closure of existing Runway 2L-20R.

**1.7 SUMMARY OF UNRESOLVED ISSUES**

The "General Plan of the County of Maui, 1990 Update" (General Plan), policy to "maintain current and future runway lengths to no more than 7,000 feet..." does conflict with the proposed extension of existing Runway 2L-20R to 9,600 feet during the five year time frame, and the construction of a new parallel runway of 8,500 feet during the years 2000 to 2010. The basis for this requirement was to a large degree due to the County's concern for the internationalization of the Airport. DOT has determined that an International Arrivals Facility will not be provided.

DOT is aware of Maui's governmental and public concerns regarding the Proposed Action. DOT has and will continue to work with the various governmental agencies and public organizations through the Federal EIS process. DOT also will assure that the Proposed Action meets the State's project objectives and purpose.

**1.8 SUMMARY OF COMPATIBILITY WITH LAND USE PLANS AND POLICIES**

The Proposed Action is consistent with the Hawaii State Plan and the State Functional Plans. The Proposed Action supports the land use plans and policies of the County General Plan, *except* for the above policy to maintain current and future runway lengths to no more than 7,000 feet. To the extent the County's policy is based on the concern for internationalization, the Proposed Action by not including an International Arrivals Facility provides a degree of compatibility with the County's policy.

The Proposed Action also conforms to and supports the Hawaii Coastal Zone Management Program's objectives to protect and maintain valuable coastal resources, outlined in Chapter 205-A, Hawaii Revised Statutes by maintaining access to the shoreline, improving Kanaha Beach Park facilities and not adversely impacting nearby coastal resources.

## 1.9 COMPARABLE COMPLIANCE WITH FAA ORDER 5050.4A

Due to the requirements of the Hawaii EIS Law, the format of this EIS follows its requirements. The EIS has also been written with the guidance of FAA Order 5050.4A, Airport Environmental Handbook. This section is included for those reviewers who need the information as required under FAA Order 5050.4A, Airport Environmental Handbook with the understanding, as explained at the outset, that this EIS has been prepared in a timing sequence vis-a-vis the FAA and format that does not purport to comply with NEPA at this time.

### NOISE

The probable noise impacts from the Proposed Action are discussed in Section 6.4.

### COMPATIBLE LAND USE

The relationship of the Proposed Action to land use plans, policies and controls are discussed in Section 11.0.

### SOCIAL IMPACTS

The probable socioeconomic impacts from the Proposed Action are discussed in Section 7.0.

### INDUCED SOCIOECONOMIC IMPACTS

The probable induced socioeconomic impacts from the Proposed Action are discussed in Section 7.0.

### AIR QUALITY

The probable air quality impacts from the Proposed Action are discussed in Section 6.5. No violations of Hawaii State or National Ambient Air Quality Standards are expected.

WATER QUALITY

The probable groundwater, surface water and drainage impacts from the Proposed Action are discussed in Section 5.2.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

Kanaha Pond is classified as a wildlife refuge under Section 4 (f). Kanaha Pond *will* remain strictly a wildlife refuge, and no direct impacts are expected from the Proposed Action.

HISTORIC, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

The probable historic, archaeological and cultural impacts from the Proposed Action are discussed in Section 6.3.

BIOTIC COMMUNITIES

The probable terrestrial biota and marine biota impacts from the Proposed Action are discussed in Sections 6.1 and 5.2, respectively.

ENDANGERED AND THREATENED SPECIES OF FLORA AND FAUNA

No probable impacts to endangered and threatened species of flora and fauna are expected from the Proposed Action as discussed in Sections 6.1 and 6.2.

WETLANDS

Kanaha Pond is designated a wetlands area by the U. S. Army Corps of Engineers. No probable impacts to Kanaha Pond are expected from the Proposed Action.

FLOOD PLAINS

Flood plain and tsunami zone hazards, and their probable impacts on the Proposed Action are discussed in Section 5.3.

#### COASTAL ZONE MANAGEMENT PROGRAM

The State of Hawaii Coastal Zone Management Act is discussed in Section 12.2.10. The Proposed Action is in compliance with the intent, objectives, and policies of the Act.

#### COASTAL BARRIERS

This section is not applicable due to Hawaii's geographic location in the middle of the Pacific Ocean.

#### WILD AND SCENIC RIVERS

There are no wild and scenic rivers within the project area and, therefore, this section is not applicable.

#### FARMLAND

The probable impacts to agricultural lands from the Recommended Alternative are discussed in Section 5.1. Coordination with the U.S. Department of Agriculture is required to determine whether the agricultural lands to be acquired and converted to Urban land use are considered to be lands protected by the Farmland Protection Policy Act, P.L. 97-98.

#### ENERGY SUPPLY AND NATURAL RESOURCES

The probable electrical resource impacts from the Recommended Alternative are discussed in Section 8.6.

#### LIGHT EMISSIONS

It is expected that the Proposed Action, although generating additional light emissions, will be designed to minimize probable lighting emissions, intensity, and impacts to both the Airport and the surrounding areas.

#### SOLID WASTE IMPACTS

The probable solid waste impacts from the Proposed Action are discussed in Section 8.5.

## CONSTRUCTION IMPACTS

Construction impacts from the Proposed Action are discussed in the various sections for water quality and drainage (Section 5.2), noise (Section 6.4), and air quality (Section 6.5). Sections 7.3 and 8.7 discuss the socioeconomic and police protection impacts from short-term construction activity.

### 1.10 NECESSARY APPROVALS AND PERMITS

#### Federal

Federal Aviation Administration      Approval of Airport Layout Plan

#### State

State Land Use Commission      Land Use Boundary Amendment  
Department of Health      NPDES Permit

#### County of Maui

Planning Department

Wailuku-Kahului Community Plan  
Amendment; Rezoning; SMA Permit

Department of Public Works

Grading Permit

Building Department

Building Permit

### 1.11 ACTUAL CONSTRUCTION

No actual construction of the the five Recommended Actions within Phase 1 that require FAA approval, as identified in Section 1.4, Proposed Action, will begin until a formal proposal is made to the FAA, an EIS is prepared pursuant to NEPA and the proposal receives the FAA's formal approval.

## 2.0 PROJECT OBJECTIVES AND NEED

### 2.1 PROJECT OBJECTIVES AND NEED

DOT operates Kahului Airport for the purpose of providing safe, efficient, and economical air transportation facilities to the people and visitors of Maui. This is done by constructing and operating airport ground facilities needed by the Airport's users (airlines, ground transportation operators, general aviation operators, individual pilots, and aircraft owners, etc.).

The Kahului Airport Master Plan was last updated over 10 years ago. Since that time, the Airport has experienced substantial, documented increases in aviation activity and passenger usage. The Kahului Airport Master Plan Update Study reviewed the Airport's existing conditions and needs, forecast future activity, usage and needs and recommended airport improvements and other actions required to meet those needs, and to significantly enhance margins of safety and efficiency. As we described at the outset, Section 1.4 Proposed Action, although all such needs are identified, only those proposed during the next five years (Phase 1) are recommended for action in the near-term.

The specific new and/or upgraded facilities need to satisfy these needs are dependent upon the forecast level of activity (defined by such things as number of passengers, number and type of aircraft operations, number of based aircraft, origins and destinations served, ground transportation preferences of airport users, etc.). This Section includes a review of historical air traffic activity and the forecast level of activity the Airport facilities would need to accommodate. The activity forecasts were developed for the Hawaii Statewide Airport System Plan and assume that visitor industry activity (the principal determinant of passenger volumes and, therefore, air carrier activity) will continue to grow substantially through the planning period.



## 2.2 HISTORICAL AIR TRAFFIC ACTIVITY

Kahului Airport is the principal airport serving air travelers to the Island of Maui. The total number of passengers using Kahului Airport [i.e., both enplaning (departing) and deplaning (arriving) passengers] increased from 1,166,494 passengers in 1970 to 3,005,032 passengers in 1980, and 4,936,971 passengers in 1990 (a 423 percent increase).

Direct overseas scheduled service to Kahului Airport started in January, 1983. Total overseas passengers increased from 321,085 passengers in 1983 to 1,117,242 passengers in 1990. During the same period, interisland passengers increased from 3,343,653 to 3,819,729.

The total volume (i.e., incoming and outgoing) of air cargo at the Airport increased from 10,404 tons in 1970 to 24,220 tons in 1980, and to 35,820 tons in 1990. Nearly three times as much cargo is flown into Kahului Airport as is flown out. In 1990, overseas air cargo volumes were 13,166 tons, and interisland air cargo volumes were 22,654 tons. The air cargo volume to the Mainland is limited by the cargo capacity of the aircraft flying the routes. Because of takeoff weight restrictions imposed by the existing 7,000 foot runway at Kahului Airport, airlines flying non-stop to the Mainland are unable to accommodate all of the cargo shippers would like to send.

A significant amount of cargo is transported on passenger aircraft. In addition, interisland air cargo also moves on all-cargo flights, many of which are currently scheduled at night. Incoming flights deliver a wide variety of perishable food items, newspapers, and manufactured goods. Outgoing cargo consists primarily of perishables such as fruits and vegetables.

Total interisland air mail volumes increased from 2,008 tons in 1970 to 2,338 tons in 1980, and to 4,117 tons in 1990. Overseas air mail volume was 31 tons in 1989 (however, only 1 ton was actually reported to DOT in 1990).

Helicopter operations at Kahului Airport during 1989 numbered approximately 37,400. According to DOT Landing Reports, helicopter operations accounted for about 20 percent of the total aircraft operations at Kahului Airport during that year. Helicopter operations at the Airport have increased in recent years because of rising interest in helicopter sightseeing flights and because of the closure of other heliports on Maui.

Total aircraft operations (i.e., passenger airline, commuter/air taxi, cargo general aviation, helicopter and military flights, in and out of the Airport increased from 77,451 in 1970 to 182,686 operations in 1990, an overall increase of 136 percent.

## 2.3 FORECAST METHODOLOGY AND ASSUMPTIONS

The Hawaii Statewide Airport System Plan (SASP), dated December 1990, presents forecasts for passengers, air cargo and mail, aircraft operations, and based aircraft for all of the airports in the State. Based on these forecasts, it recommends the aviation facilities needed to meet the long-term demands of the State through 2010.

The SASP forecasts were derived from long-range visitor and population forecasts prepared by the State of Hawaii, Department of Business & Economic Development (DBED). They take into consideration the most important factors believed to affect future aviation activity in the State. The actual level of activity experienced will be affected by fluctuating economic conditions and policy choices. Consequently, the forecasts are made within the reality of such parameters.

### 2.3.1 FORECAST METHODOLOGY

The SASP used several multiple regression analyses to forecast total passengers both Statewide and for the individual counties. The regression analyses were prepared using historical passenger data and, as applicable, historical and forecast data for visitor arrivals, resident population, and average daily visitor census as the independent variables.

The first set of regression analyses was prepared using the Population and Economic Projections for the State of Hawaii to 2010 (Series M-K) prepared by the DBED in November 1988. Current State policy is to use the M-K Series forecasts as a basis for facility planning, with adjustments made as necessary to insure that the public facilities needed to accommodate anticipated demand are developed in a timely manner. The 1988 M-K Series forecasts provide for a continuing high rate of visitor growth during the late 1980's, with lower growth rates thereafter. These published visitor industry projections to the State of Hawaii are shown in Table 2.3.1.

Table 2.3.1.  
M-K Series and SASP Statewide Visitor Forecasts  
1990-2010

<u>Period</u>	<u>DBED M-K Series (1)</u>		<u>SASP</u>	
	<u>Ave. Annual Increase (%)</u>	<u>Annual Visitors at End of Period</u>	<u>Ave. Annual Increase (%)</u>	<u>Annual Visitors at End of Period</u>
1985-1990	6.0	6,521,000	3.9	6,971,000
1991-1995	3.5	7,746,000	3.4	8,112,000
1996-2000	3.0	8,979,000	3.0	9,500,000
2001-2005	2.5	10,159,000	2.5	10,700,000
2006-2010	2.5	11,494,000	2.5	12,100,000

Note: 1. Population and Economic Projections for the State of Hawaii to 2010 (Series M-K), Department of Business and Economic Development, State of Hawaii, November, 1988

The M-K Series projections are essentially demand forecasts based on economic activity and trends. They take into consideration the economies of the United States and Japan, Hawaii's primary visitor-generating regions. They assume airline equipment, airport facilities, visitor accommodations, and other factors will not constrain demand. They do not necessarily

represent State or County goals and do not take into account State or County land use policies that might limit demand.

Higher levels of Neighbor Island tourism have been projected in the M-K Series, a reflection of the higher level of tourism projected for the State through 2010. The levels of tourism to the Neighbor Islands are distributed primarily on the basis of estimates of occupied visitor rooms among the individual counties.

During preparation of the SASP, a review of data provided by the Hawaii Visitors Bureau (HVB) indicated the total overall visitor growth to the State during the past few years had averaged 8 percent, which was more than the 6 percent estimate incorporated in the DBED M-K Series projections. Based on discussions with DBED representatives, a second set of regression analyses was prepared using more recent DBED short-term economic forecasts for the State through 1995. The SASP used the more recent DBED forecasts to arrive at a revised short-term forecast of 8,112,000 visitor arrivals in 1995; this is 5 percent higher than the 7,746,000 in the M-K Series. The SASP then used the average annual passenger growth rates from the M-K Series for the 1995 through 2010 period to arrive at its forecast of visitor levels. These are also shown in Table 2.3.1.

### 2.3.2 FORECAST ASSUMPTIONS

During preparation of the SASP, discussions were held with representatives of the Office of State Planning, DBED, HVB and the individual County Planning Departments. In addition, discussions were held with representatives of the Hawaii Hotel Association, Airlines Committee of Hawaii, airlines providing overseas and interisland service to the State, and various tour operators. As a result of the discussions with the above organizations and representatives of DOT, future Statewide aviation activity was prepared assuming all international flights would continue to arrive and depart through Honolulu International Airport.

The following assumptions were used:

1. The economic, demographic and visitor projections based on the DBED M-K Series, adjusted to reflect higher than anticipated growth during the early part of the period, are the bases for the aviation demand forecasts. (Note: the SASP's 2010 Statewide forecast of 36,956,000 passengers is only about 5 percent higher than the 35,105,000 passengers in the published M-K Series projections. Even with a very modest rate of increase, the difference between the adjusted and unadjusted forecasts would be made up in just a year or two, and it was believed that the higher numbers were more appropriate for airport planning purposes.)
2. Overseas passengers have accounted for an increasing share of the total passengers in recent years. Overseas passengers are forecast to account for an increasing share of the total Statewide passengers through the forecast period, rising from 43 percent in 1989 to 50 percent by 2010.
3. Eastbound passengers have accounted for an increasing percentage of the total passengers to Hawaii in recent years, rising from approximately 25 percent in 1980 to 29 percent in 1989. The forecast of strong economic growth in Pacific Rim countries such as Japan, Korea, Taiwan, Hong Kong, and Singapore is expected to provide increasing eastbound visitors to the State, and raising eastbound visitors share of the total passengers. In addition, there is the potential for increased international visitors from other areas, and for direct flights from other parts of the world such as Europe. Overall, the SASP forecasts that international passengers will increase from 29 percent of the total overseas passengers in 1989 to approximately 35 percent of the total overseas passengers in 2010. As a corollary, the Mainland's share of total passengers is forecast to decline from 71 percent to 65 percent of the total. Honolulu International Airport's (HIA) share of total overseas westbound passengers is forecast to continue to decline, from 86 percent of the total in 1989 to 78 percent in 2010. This reflects a trend toward more non-stop flights directly to and from the Neighbor Islands.

4. Overseas mainland passengers to Keahole and Lihue Airports are assumed to increase at a higher percentage rate than at Kahului Airport. In 1988, the overseas passenger distribution for the Neighbor Islands was 80 percent at Kahului, 13 percent at Keahole and 7 percent at Lihue. For 1989, the percentages were approximately 76 percent at Kahului, 15 percent at Keahole and 9 percent at Lihue. This distribution is expected to change over time to 55 percent for Kahului, 25 percent for Keahole and 20 percent for Lihue by 2010.
5. As previously noted, it was assumed that overseas mainland service to the Neighbor Island airports would not be constrained by the adequacy of airport facilities and services.
6. The forecasts of air carrier operations reflect DHC-7 aircraft operations being counted as commuter/air taxi by FAA at all airports in the future rather than as air carrier. This reporting change was initiated by FAA in 1989. Also, the interisland passenger forecasts do not include helicopter air taxi passengers because such data are not reported separately to the State. However, commuter/air taxi operation forecasts include such helicopter air taxi operations and air cargo, air taxi operations.
7. Based on airline questionnaires and discussions with airline representatives, it was assumed that overseas flights at HIA will be primarily by B-747/DC-10/L-1011/MD-11/B-767/B-757 type aircraft in the future. At the Neighbor Island airports, overseas flights are expected to be by DC-10/L-1011/DC-8 type aircraft over the next 5 years and DC-10/L-1011/MD-11/B-767/B-757 type aircraft through the year 2010.
8. Based on current technology and economic projections, interisland air carrier operations are expected to be by B-737, DC-9, MD-80, and BAe 146 type aircraft in the reasonably foreseeable future. Interisland commuter/air taxi operations are expected to be by DHC-6, DHC-7, DHC-8, Cessna 402, and Piper-31 type aircraft in the reasonably foreseeable future. When the SASP forecasts were prepared, there was scheduled interisland air carrier service by three airlines. As a result, lower passenger load factors were assumed initially with a gradual return to the current passenger load factors over the forecast period. If there is service by only two airlines as currently occurs, then the number of air carrier operations

may be somewhat over-estimated for the initial forecast periods.

9. Air cargo and mail volumes are forecast to increase in proportion to forecast population and average daily visitor census increases in each County. With specific reference to air cargo volumes at Neighbor Island airports, it likely would increase with the greater availability of direct overseas service to and from the Mainland. All "all-cargo" aircraft operations included in the forecasts of air carrier and commuter/air taxi operations are done so according to the type of aircraft normally being used (i.e. B-747, DC-8 and B-737 versus Cessna 208).

10. The number of fixed wing-based aircraft are assumed to increase at approximately the same rate as the resident population for each County from 1990 to 2010. The number of helicopter based aircraft is forecast to increase in proportion to the increase in average daily visitor census for each County as the helicopters are used primarily for visitor sightseeing flights.

11. Military operations are forecast to be constant through 2010.

#### 2.4 FORECASTS FOR KAHULUI AIRPORT

The SASP assumed that Kahului Airport will remain the principal airport on the Island of Maui, and estimated passenger and aircraft activity levels at Kahului Airport on that basis. The SASP forecasts represent "unconstrained" demand, i.e., they assume that airport facilities necessary to accommodate the forecast level of activity will be provided.

As illustrated in Table 2.4.1 and Figure 2.4.1, the total number of passengers (enplaned and deplaned) at Kahului Airport is estimated to increase from 4,745,514 in 1989 to 9,059,000 by 2010, an overall increase of 91 percent. Overseas (i.e. Mainland) passengers are forecast to increase from 1,081,411 in 1989 to 2,377,000 passengers by 2010 (a 120 percent increase). Interisland passengers are expected to continue to account for the majority of the passengers in the future, increasing from 3,664,104 in 1989 to 6,682,000 passengers by 2010, an overall increase of 82 percent.

Table 2.4.1. Statewide Airport System Plan Forecasts: Kahului Airport

ITEM	Actual	Annual Forecasts			
	1989 (1)	1995	2000	2005	2010
<b>Passengers</b>					
<b>(Enplaned and Deplaned)</b>					
Overseas-Mainland	1,081,411	1,392,000	1,726,000	2,052,000	2,377,000
Interisland	<u>3,664,104</u>	<u>4,811,000</u>	<u>5,424,000</u>	<u>6,000,000</u>	<u>6,682,000</u>
<b>Total</b>	<b>4,745,515</b>	<b>6,203,000</b>	<b>7,150,000</b>	<b>8,052,000</b>	<b>9,059,000</b>
<b>Cargo and Mail</b>					
<b>(Enplaned and Deplaned)</b>					
Cargo (tons)	34,558	39,800	46,400	53,000	58,500
Mail (tons)	<u>3,851</u>	<u>4,200</u>	<u>4,600</u>	<u>5,000</u>	<u>5,500</u>
<b>Total</b>	<b>38,409</b>	<b>44,000</b>	<b>51,000</b>	<b>58,000</b>	<b>64,000</b>
<b>Aircraft Operations</b>					
Air carrier	56,981	88,100	93,900	98,500	104,000
Commuter/air taxi	63,444	89,900	102,100	108,500	120,000
General aviation	49,823	57,000	63,000	68,000	74,000
Military	<u>7,555</u>	<u>8,000</u>	<u>8,000</u>	<u>8,000</u>	<u>8,000</u>
<b>Total</b>	<b>177,803</b>	<b>235,000</b>	<b>267,000</b>	<b>283,000</b>	<b>306,000</b>
<b>Based Aircraft</b>	<b>48</b>	<b>56</b>	<b>62</b>	<b>67</b>	<b>75</b>

Note 1: Data from Department of Transportation, State of Hawaii, and FAA Air Traffic Control Tower

Source: "Hawaii Statewide Airport System Plan," dated December, 1990, prepared for DOT by Wilson Okamoto & Associates, Inc. and Aries Consultants Ltd.



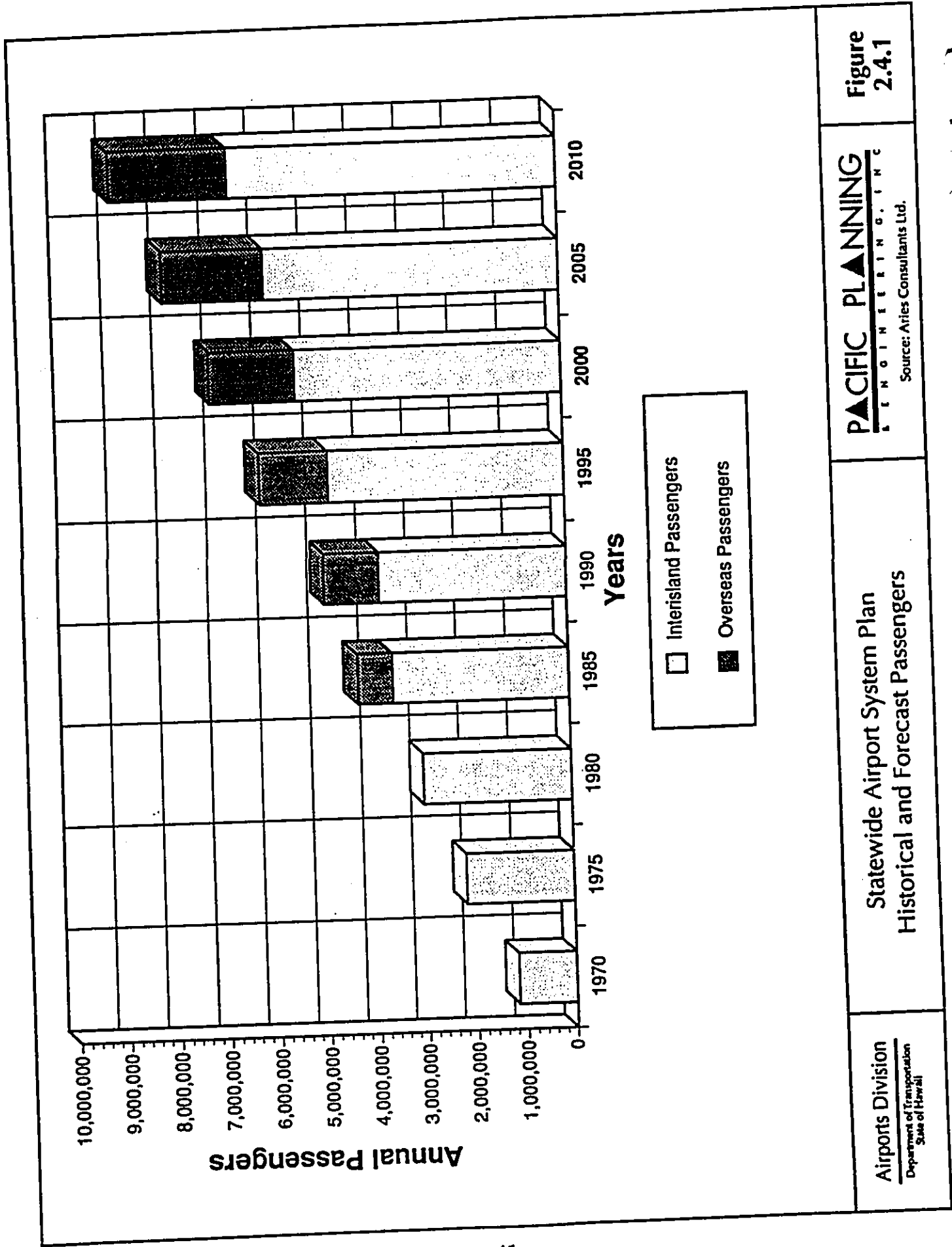


Figure 2.4.1

PACIFIC PLANNING  
ENGINEERING INC

Source: Aries Consultants Ltd.

Statewide Airport System Plan  
Historical and Forecast Passengers

Airports Division  
Department of Transportation  
State of Hawaii

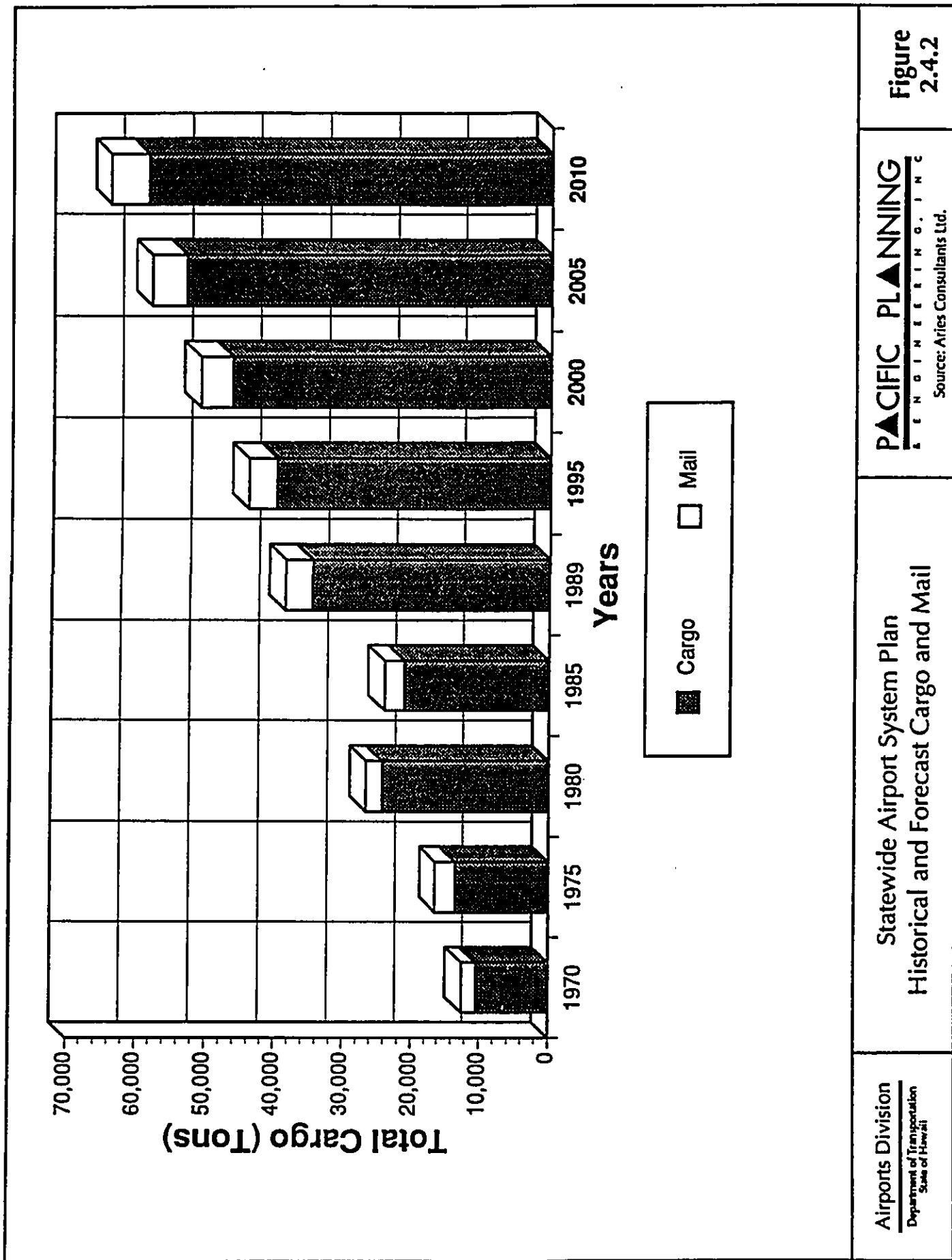
Total annual volumes of air cargo and mail are forecast to increase from 38,409 tons in 1989 to 64,000 by 2010 as illustrated on Figure 2.4.2.

Total annual aircraft operations are forecast to increase from 177,803 in 1989 to 306,000 operations in 2010 (see Table 2.4.1 and Figure 2.4.3). Air carrier aircraft operations are forecast to increase from 56,981 in 1989 to 104,000 in 2010. About 5 percent of the air carrier operations are assumed to be air carrier cargo operations.

Commuter/air taxi operations (which includes helicopters) are forecast to increase from 63,444 operations in 1989 to 120,000 operations in 2010. Such helicopter air taxi operations are increasing at the Airport and are forecast to account for about 50 percent of the total commuter/air taxi operations by 2010. About 7 percent of the commuter/air taxi operations are expected to be air taxi cargo operations.

General aviation operations are forecast to increase from 49,823 operations in 1989 to 74,000 operations in 2010. Military aircraft operations are forecast to remain at approximately 8,000 operations per year through 2010.

The SASP forecasts that the number of based aircraft will increase from 48 in 1989 to 75 by the year 2010. Sightseeing helicopters are expected to account for a significant portion of the increase. The number of helicopters expected at the Airport will decrease considerably if an off-Airport heliport is developed. Similarly, the number of based fixed-wing aircraft would be reduced if an alternate general aviation airport becomes available to handle most of the general aviation operations.



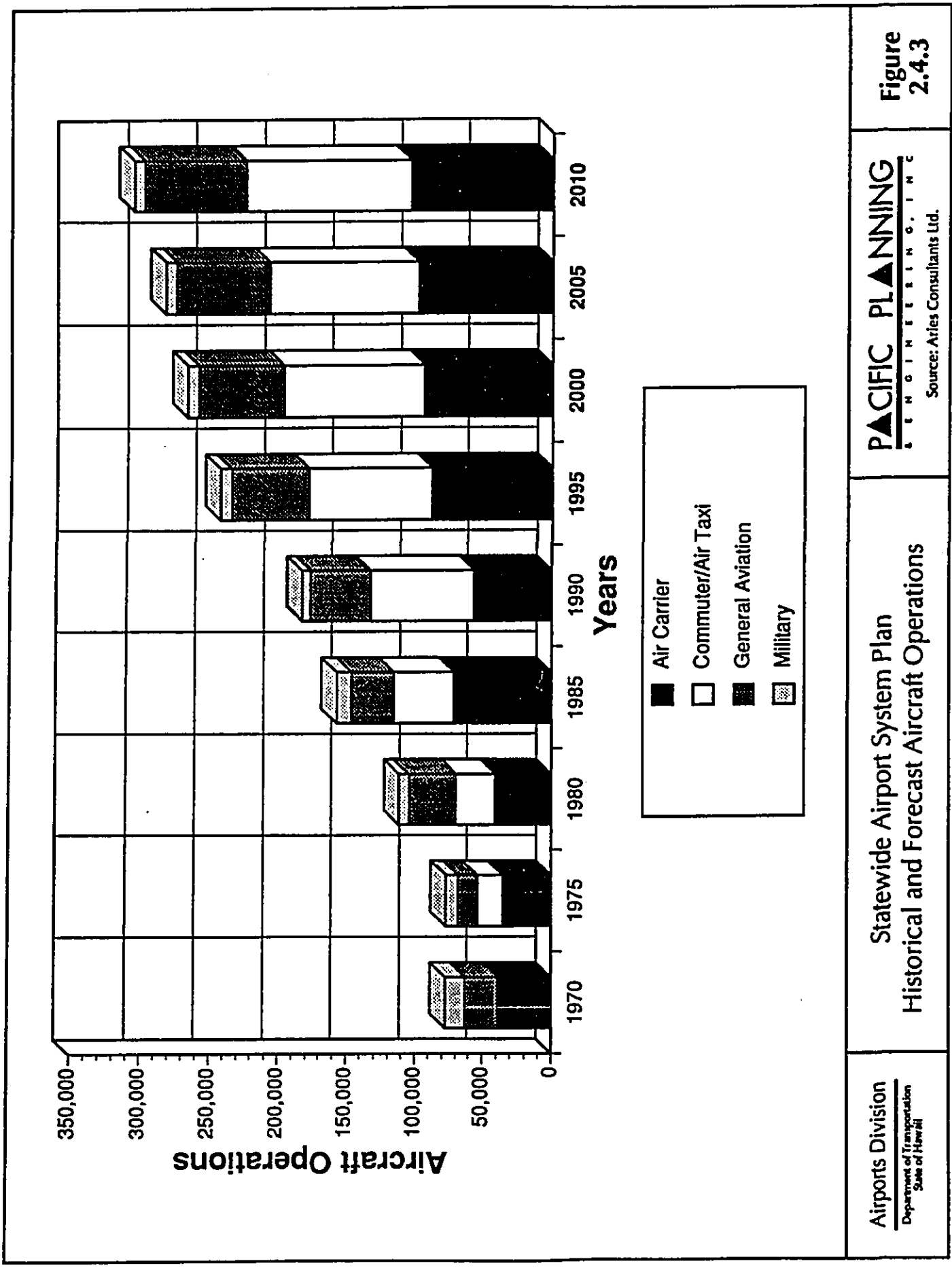
**Airports Division**  
 Department of Transportation  
 State of Hawaii

**Statewide Airport System Plan**  
 Historical and Forecast Cargo and Mail

**PACIFIC PLANNING**  
 ENGINEERING INC.  
 Source: Artes Consultants Ltd.

**Figure 2.4.2**

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



Airports Division  
 Department of Transportation  
 State of Hawaii

Statewide Airport System Plan  
 Historical and Forecast Aircraft Operations

PACIFIC PLANNING  
 ENGINEERING INC  
 Source: Aries Consultants Ltd.

Figure 2.4.3

## 25      ACTIVITY SCENARIOS STUDIED IN THE FINAL EIS

The forecasts contained in the SASP assumed that the airport improvements recommended in the SASP report (which at Kahului Airport included an extension of the existing runway to 10,500 feet and the construction of a parallel runway by the year 2010) would be made. Since the improvements recommended in the preliminary draft Kahului Airport Master Plan Update Study are generally consistent with those envisioned in the SASP (i.e., an extension to Runway 2L-20R to 9,600 feet and the construction of a 8,500 foot runway parallel to Runway 2L-20R), the SASP forecasts represent the level of activity anticipated if the master plan recommendations are implemented.

Table 4.1.1 of the Draft EIS (DEIS) listed the level of passengers and aircraft operations (by type) that are anticipated given various airport facility development scenarios (including No-Action). It showed the same domestic passenger volumes for all of these. This conclusion vis-a-vis the same passenger volume was based on two findings:

1. That the forecast level of passengers through 2010 could be accommodated by the existing Airport facilities (but with less than the desired level of service).
2. That visitors have not historically, and would not in the future, be measurably discouraged from coming to Maui by the length or condition within reason of the existing runway (and the limited non-stop flight range which it imparts) or by the existing terminal facilities.

Based on these finding, the DEIS concluded that the airport improvements that were under consideration would increase the level of service provided by the Airport, but were unlikely to contribute to a significantly higher level of visitor industry activity (and associated secondary growth) than would occur if the airport improvements were not made.

The same analysis showed that airfield capacity limitations would probably limit the number of general aviation (local or training) aircraft operations to less than the number that would be made if no capacity constraints existed (e.g., if additional airfield capacity was created). Thus, the No-Action alternative assumed a lower level of general aviation activity than the alternatives that provided additional airfield capacity.

#### Concerns Expressed About DEIS Estimates of Passengers and Visitors

A number of individuals commenting on the DEIS disagreed with the forecast assumptions and the conclusion that airport improvements would not affect the level of visitor activity or secondary growth on Maui. The criticisms fell into four major categories:

1. Some reviewers expressed the belief that it may have been inappropriate for the SASP to have adjusted the Series M-K visitor arrival forecasts upwards on the basis of a limited period of above-forecast passenger growth. They recommended that the unadjusted M-K figures be used instead.
2. Another group of reviewers thought that it was inappropriate to use the long-range DBED Series M-K forecasts because they do not take into account recently adopted County policies which might limit the development of visitor facilities and, therefore, the number of people flying to and from the island. Pointing to the new Maui County General Plan, these individuals maintained that the level of visitor facility development likely to be permitted by the County between now and the year 2010 would not accommodate the number of visitors forecast in the M-K Series (which assumed that visitor facility development would be limited only by the visitor market, not by the County's land use controls). They recommended the use of lower passenger forecasts which they felt would be more consistent with the Maui General Plan. Some of the individuals in this category maintained that lower forecast numbers were particularly appropriate in view of recent data which they felt indicated a decline in visitors' interest in Maui as a vacation spot.

3. The availability of a runway longer than the existing 7,000 foot Runway 2-20 would allow aircraft to fly non-stop to points more distant than the West Coast. Some reviewers (including several in the visitor industry) expressed the belief that this would increase the number of people choosing to vacation on Maui. These individuals maintained that increasing the length of the existing runway would result in more non-stop flights between Maui and interior cities in the U.S. (e.g., Denver, Dallas/Fort Worth, Chicago, etc.) not currently being served non-stop and/or that it would increase the passenger loads that airlines could carry to the West Coast cities they already serve to the point where more people would decide to visit the island. These reviewers asked that the effects of these increased visitations be evaluated as a "secondary impact" of the runway extension.

4. Finally, some reviewers disagreed with the conclusion that the provision of international arrival facilities (discussed as a possibility in the DEIS) at Kahului Airport (and the presumed initiation of non-stop flights between Maui and international locations such as Japan) would not increase the number of passengers and visitor-days spent on Maui. They maintained that the increased accessibility and convenience provided by non-stop flights between Maui and foreign destinations would affect visitor arrivals from those countries in the same way that the initiation of direct Maui-West Coast service in the 1980's is presumed to have affected the number of Mainland visitors to the island. They also asked that the secondary impacts of any such growth in foreign visitor arrivals and visitor-days be evaluated in the DEIS.

#### Adjustments In Alternative Analysis For Final EIS

After reviewing these comments, DOT has concluded that it is appropriate to continue to use the SASP forecasts to represent the level of activity that would be experienced based on the premise that improvements recommended in the Master Plan are implemented in response to that demand. This is believed to be the "conservative" and prudent approach and is used as the "Base No-Action Scenario" in the Final EIS. It assumes the highest level of activity that can be reasonably documented and, therefore, the greatest apparent environmental effect (i.e., the worst case).

If the actual volumes experienced are lower, as they could be if the lower visitor numbers in the DBED's basic M-K Series were realized or if other constraints on development on the island of Maui limited the growth that actually occurs, then those environmental impacts which are related to total population and visitor activity, including secondary effects (e.g., traffic, demand for public services, etc.) would be less than reported here.

While DOT believes that the passenger numbers forecast by the SASP are likely to be achieved without the construction of a longer runway, it acknowledges that there is sufficient concern reflected in the comments over the extent to which passenger and visitor volumes might be lower without the recommended improvements than they would be with them to warrant evaluating a second No-Action Scenario in the Final EIS. This scenario (which represents a different impact scenario rather than a different plan) will be referred to as the "Constrained No-Action Scenario." It assumes ten percent fewer passengers than the SASP forecast growth.

Because DOT has determined that an International Arrivals Facility will not be included in the recommended plan through 2010, the potential effects of providing such facilities is not evaluated in the Final EIS.

#### Bases for DEIS Conclusions Concerning Runway/Activity Level Relationships

As previously noted, the SASP forecasts assumed the existence of "unconstrained" conditions, i.e., they assumed that sufficient airfield and terminal facility capacity would be provided to accommodate the travel preferences of the passengers and airlines desiring to use the Airport. Thus, the level of activity forecast in the SASP represents the level anticipated with a longer runway. The DEIS concluded that limiting the Airport to the two existing runways (7,000 foot long Runway 2-20 and 4,990 foot long Runway 5-23) and terminal facilities would not prevent the SASP passenger forecasts from being realized, but would increase aircraft delays and decrease the levels of service provided. Consequently, the DEIS used the same passenger volumes for the master plan alternatives that involved runway extensions and/or the construction of a parallel runway as it did for



the alternatives which kept only the existing runways. The bases for these conclusions are outlined below.

#### *Effect of Runway Length*

The SASP's conclusion that the level of visitor activity and passenger arrivals in the year 2010 is not dependent on runway length or number of runways was based on a number of considerations, including the following:

1. Non-stop and "same-plane" air service (through HIA) between Maui and the U.S. West Coast has been available since 1983. In addition, same-plane service is already available from Kahului to several of the cities most likely to have non-stop service (e.g., Chicago, Dallas, and Atlanta) if the runway were extended to more efficiently accommodate such services. About one-half of the current overseas flights to and from Kahului Airport are non-stop and about one-half are routed through Honolulu. Because the SASP forecasts were based on a regression analysis of historical data covering this time frame, the forecasts of activity already reflected the effects on visitor arrivals that reviewers assumed could only be the result of improving air carrier service.
2. Airline representatives contacted during the study indicated their belief that routing passengers through West Coast gateways (Los Angeles and San Francisco) and one-stop service rather than providing non-stop service from inland cities such as Dallas/Fort Worth, Chicago and Denver discourages relatively few passengers from making the trip (i.e., the inconvenience caused by such stops has little or no effect on passenger choices).
3. The distribution of potential visitors to Maui (i.e., the number that actually wanted to go directly to Maui on any one flight) and the economics of present-day airline operations are such that airlines would tend to operate many of their Maui-Mainland flights through West Coast hubs even if Kahului Airport's runways were extended to allow departures to more distant destinations. Thus, the ability to fly non-stop to the Mid-West was judged likely to result in relatively few actual non-stop flights between Maui and airports in that part of the country.

*Effect of Parallel Runway*

As previously noted, the existing runways at Kahului Airport are capable of accommodating the number of air carrier operations which the SASP forecasts through the year 2010 (albeit within diminished efficiency parameters). It follows that even the addition of a parallel runway would not generate more passenger travel through the Airport within the planning period than would otherwise be the case. (It would, however, allow increased volume in later years).

The added capacity provided by a parallel runway would allow continued general aviation training activities at the Airport, a category of operations that would be significantly impacted by the congestion that will be experienced if an additional runway is not constructed. It would also provide valuable backup air carrier capability that would allow the Airport to operate with less disruption when existing Runway 2-20 must be temporarily closed for maintenance and/or repairs. A parallel runway would also substantially reduce aircraft delays in the long-term, thereby lowering airline operating costs and improving the level of service provided to passengers. The latter would probably result in a marginal decrease in aircraft operating costs. These could be passed on to passengers in the form of lower fares, or, as is often the case, could allow the airlines to increase fares. (Currently, for example, it is less expensive to travel through Honolulu to the West Coast than to fly non-stop). However, the cost reduction would probably be such a small part of visitors' overall travel costs and would be at least partially offset by increased airport user fees needed to help fund the improvements; hence, this is unlikely to result in a significant increase in demand.

DOT believes these factors are likely to minimize any shortfall that might occur if the runway extension recommended in the draft Master Plan Update Study is not implemented. At the same time, it acknowledges that the issue is complex and that it would be advisable to include a discussion of this issue in the Final EIS as a No-Action Scenario to examine the extent to which apparent impacts are sensitive to it. Since this results in there being a difference between the "with project" and "without project" alternatives, the discussion of secondary impacts in the Final EIS differs from that contained in the DEIS.

### Activity Levels to be Evaluated in the Final EIS

#### *I. Base No-Action Scenario*

Historically, in Hawaii there has not been a close correlation between the provision of airport facilities and the subsequent growth of the surrounding community. Rather, airport improvements have tended to be made only after the existing airport facilities have become quite congested with visitors attracted by the Islands' beauty and visitor facilities. Moreover, while some visitor industry representatives consulted during the preparation of the SASP and Airport Master Plan have expressed their belief (and hope) that Airport improvements would enhance their business, others have indicated that they thought Airport improvements would have a decidedly limited role in stimulating increased visitor arrivals from the Mainland. DOT shares the belief that the kinds of airport improvements contemplated at the Airport will have little effect on visitor arrivals within the planning period. Thus, the Final EIS uses the SASP forecast of level of activity for the Base No-Action Activity Level.

As indicated previously, this does not mean that DOT believes that the activity levels forecast in the SASP will necessarily be achieved as forecast; this may, or may not occur. Nonetheless, use of the relatively higher SASP forecasts is believed to be reasonable and prudent because it will insure that: (1) adequate airport facilities are planned; and (2) the level of activity whose impacts are evaluated in the EIS is unlikely to be exceeded.

## *II. Constrained No-Action Scenario*

While there was general agreement that the SASP figures constituted a reasonable upper limit for the Base No-Action Scenario, establishing the level of activity likely if a failure to construct additional facilities does limit the number of visitor arrivals was more difficult. Some insights have come from a report entitled Airport Expansion, Direct Flights, and Consumer Choice of Travel Destinations: The Case of Hawaii's Neighbor Islands, prepared by University of Hawaii Department of Economics professors Edwin Fujii, Eric Im and James Mak in February, 1991 (hereinafter referred to as the UH Study). The specific question addressed by the UH Study was the extent to which the availability of "direct" flights between the Mainland and Maui, Kauai and Hawaii influenced the total number of visitors to those islands. (Note that the term "direct flights" included non-stop flights from neighbor islands, including Maui, to the Mainland, one-stop same-plane service through Honolulu, and same-airline/change-of-plane service through Honolulu. The UH Study did not distinguish between these.

The technical name for the analytical methodology used in the UH Study is "time-series intervention analysis employing a Box-Jenkins ARIMA model." The approach examines the behavior of a particular factor (the number of visitors to Maui) before and after some change in another factor or factors (the availability of direct air service to the neighbor islands) which it is thought might influence the first factor.

The UH Study concluded that up to 9 percent more visitors may now be coming to Maui than would be the case if there were no "direct" flights between Maui and the Mainland. Using the same analytical techniques, it concluded that the initiation of "direct" flights between the Mainland and Kauai and Hawaii Islands produced a substantially smaller effect on visitor arrivals on those islands (2 and 3 percent, respectively). A critical assumption made by the researchers was that the improvement in airline service was the only significant factor that might have altered visitors' choice of travel destinations in the Hawaiian visitor market (i.e., whether they would visit the neighbor islands or would stay only on Oahu) that occurred during the study period.

The UH Study provides useful insights into the relationship between the level of airline service (as indicated by the ability of visitors to fly "direct" to Maui from the Mainland) and the number of visitor arrivals. But it also has several significant limitations as an indicator of the possible differences between visitor levels with and without a longer runway at Kahului Airport:

1. The institution of direct Maui-Mainland flights was not associated with any improvements to airport facilities. Instead, it resulted from airlines' decisions that the market would support profitable direct Mainland service using the existing airport facilities (including the 7,000 foot long Runway 2-20). The fact that Hilo International Airport, with a 9,800 foot long runway, does not have overseas service, while Keahole Airport with only a 6,500 foot long runway does have non-stop flights to the Mainland is clear evidence that (within the limits of safety) airlines' decisions are based principally on issues of profitability rather than on the availability of certain facilities. It cannot be taken for granted that airlines will extend their non-stop service from Kahului Airport to points beyond the West Coast simply because the runway is made long enough for them to do so.

2. The assumption that the higher visitor arrivals observed following the initiation of direct flights to Maui were attributable solely to those direct flights is open to question. Many new, and attractive resort facilities were opened on Maui during the late 1980's, the island became an "in" visitor destination area, and marketing expenditures by public and private entities increased substantially. Differential effects associated with these changes (and/or many other factors) could have accounted for some or all of the observed increase in visitor arrivals (and may have accounted for the substantially smaller changes in growth rates found on the islands of Kauai and Hawaii after non-stop service to/from them was initiated). To the extent that these other factors were the true (or even partial) cause of the observed changes, the apparent influence of airport-related factors would have been less than the UH Study suggested.

3. Unlike the situation in the UH Study, the extension of the runway at Kahului Airport would simply increase the number of Mainland cities that could be served with non-stop flights. Because one-stop service is already available (either through Honolulu or the existing West Coast gateways) to many of the cities likely to be served by non-stop Maui-Mainland service it seems certain that the effect of these marginal improvements in service would be less than the change that occurred when direct (non-stop and one-stop) flights to Maui were initiated.

4. Currently, approximately 75 percent of the flights between Honolulu International Airport (HIA) and the Mainland operate through West Coast gateways. This modus of operation occurs despite the fact that the runways at HIA are long enough to give airlines complete freedom of choice with respect to Mainland destinations and that the passenger volumes at HIA are high enough to support frequent flights. In view of this continued choice, and the documented fact that many of the passengers who fly direct to inland cities on the Mainland would make the trip even if they had to pass through a West Coast gateway, it is apparent that non-stop flights to more distant, inland cities on the Mainland have a limited ability to stimulate additional travel.

In view of these factors, it appears certain that, at most, only a small part of the growth in passenger traffic forecast in the SASP could be attributed to longer runways. Most of the evidence suggests that if there is an effect from such longer runways, it would be on the order of a few percent or less. Even if all of the increased visitor traffic observed following the initiation of direct mainland service in 1983 was attributable to that service (rather than to the many other factors at work), and even if expanding the number of Mainland cities served by non-stop flights had as great an effect on visitor arrivals as did the original service, the "Constrained No-Action" Activity Level Scenario passenger volumes would be no more than 9 percent below the level of the "Base No-Action Scenario" using the SASP forecasts.

Hence, for the purpose of the Final EIS, it was decided to include a sensitivity analysis of the secondary and other impacts that could be attributable to a runway extension to 9,600 feet if passenger volumes without it were 10 percent lower than those forecast in the SASP. It is considered extremely unlikely that the difference attributable to airport improvements would reach or exceed this level. Nonetheless, a "constrained no-action activity level" was included as a means of identifying the environmental impacts that might be attributable to Airport improvements if they did, in fact, result in higher passenger volumes than would be experience without them.

## **3.0 DESCRIPTION OF PROPOSED ACTION**

### **3.1 INTRODUCTION**

This chapter describes improvements that the Kahului Airport indicates are needed and the actions recommended in the Master Plan Update Study, including those actions recommended for implementation during the next five years. It is divided into the following sections:

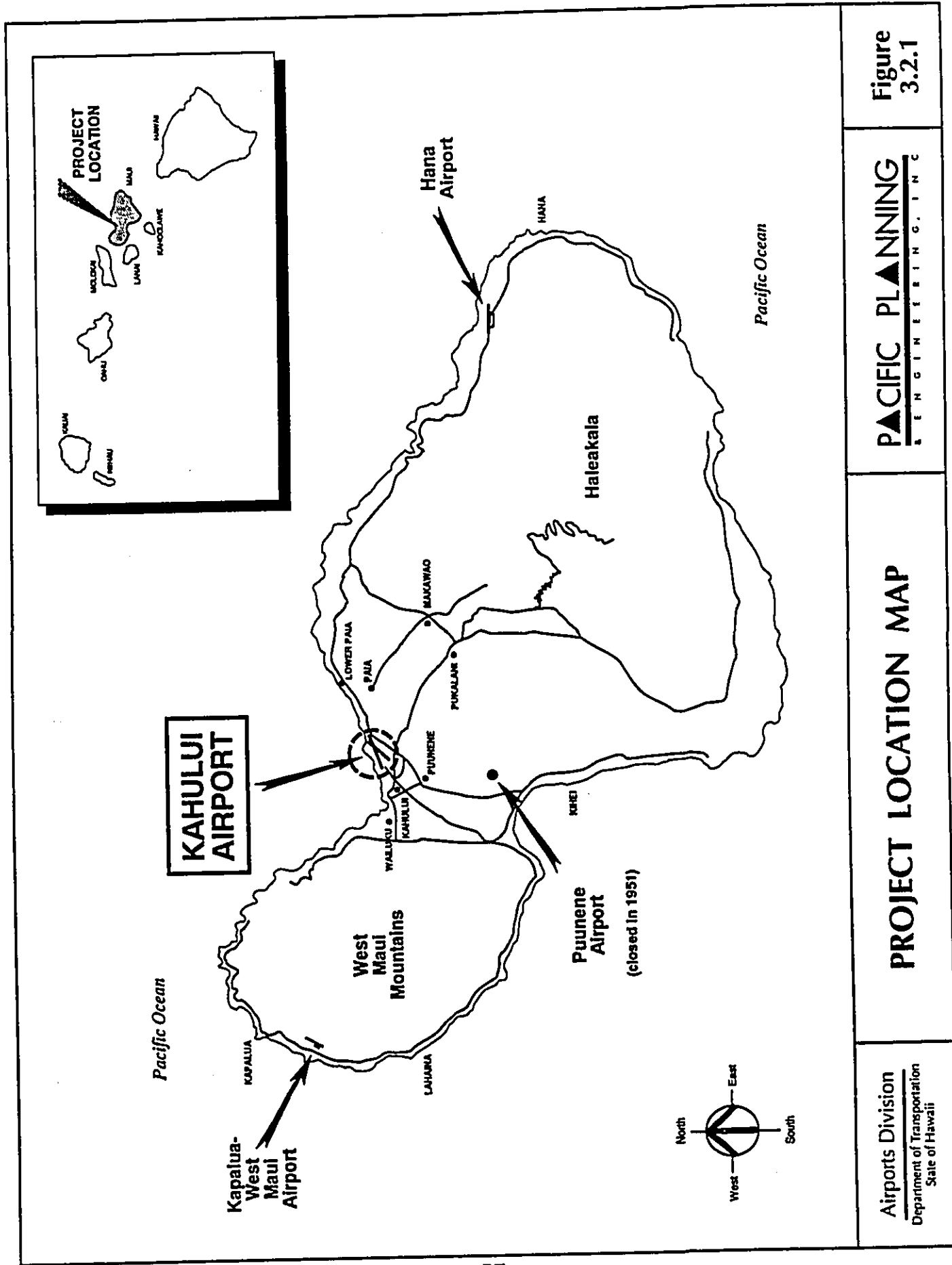
- Section 3.2 provides a description of existing conditions at the Airport and in the environs, as supplemented by other, referenced portions of this EIS.
- Section 3.3 lists the kinds of facilities that the Master Plan Update Study identified as necessary to meet the community's air transportation needs. These constitute further specification of the objectives that the Proposed Action (i.e. implementation of the Airport Master Plan recommendations) is intended to achieve.
- Section 3.4 describes the Proposed Action; it includes figures showing the location of the new facilities that would be developed over the 20-year time period covered by the plan and descriptions of the individual facilities (e.g., runways, taxiways, buildings, etc.). The description includes a listing of the land acquisition needed to implement the plan, the proposed phasing plan, and preliminary cost estimates.

### **3.2 OVERVIEW OF EXISTING CONDITIONS**

#### **3.2.1 ENVIRONMENTAL SETTING**

Maui has a total land area of 729 square miles, making it the second largest island in the State. It is located southeast of Oahu and northwest of the Island of Hawaii as shown on Figure 3.2.1. The vast majority of Maui's land area is in the State Agricultural, Rural, or Conservation Districts, with only 21 square miles in the Urban District.





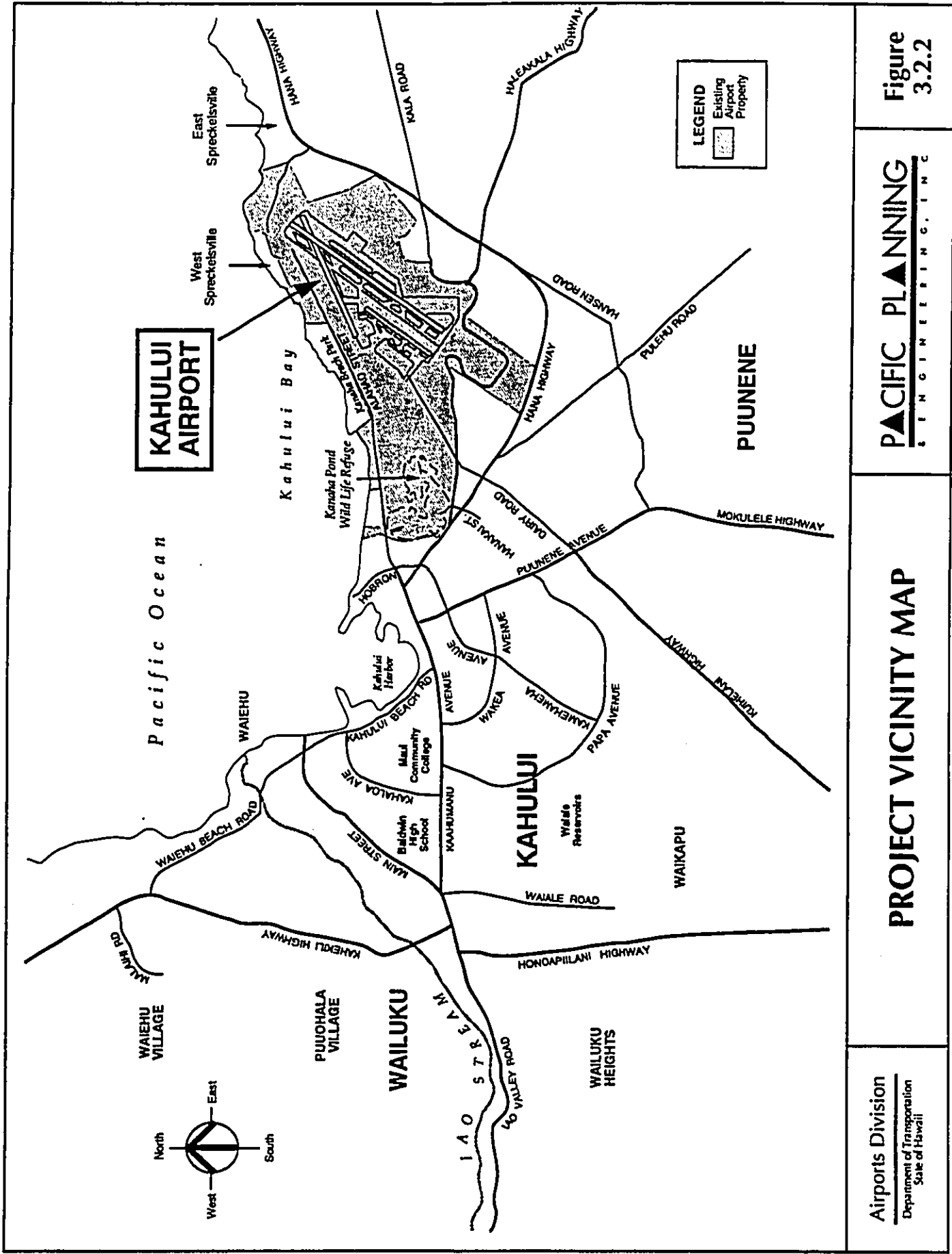
Kahului Airport is located along the northern shoreline of the isthmus between the West Maui Mountains and Haleakala Volcano (see Figure 3.2.2). It is on the eastern side of Kahului town. Puunene, an old mill town where residential areas have been nearly all razed, lies immediately to the south, while the residential areas of East and West Spreckelsville are to the north of the Airport. The Airport boundaries include approximately 1,447 acres. Except for a 3.5-acre site owned by the U.S. Postal Service, all of this is owned by the State of Hawaii and controlled by DOT. Approximately 180 acres of the land within the Airport boundary have been designated as the Kanaha Pond Wildlife Refuge; this area is managed by the State Department of Land and Natural Resources under an agreement with DOT.

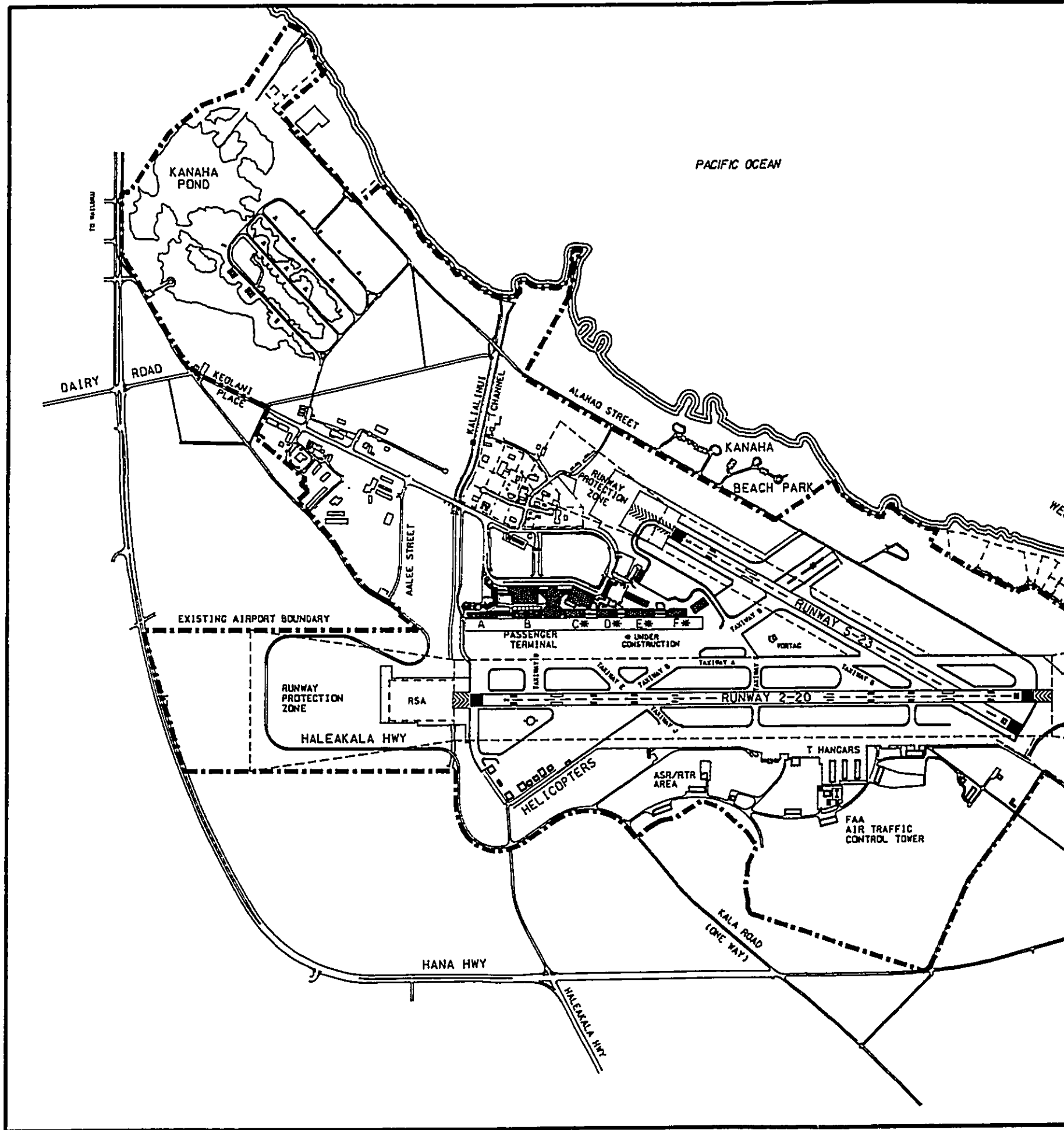
Descriptions of existing conditions are also described in the following respective sections:

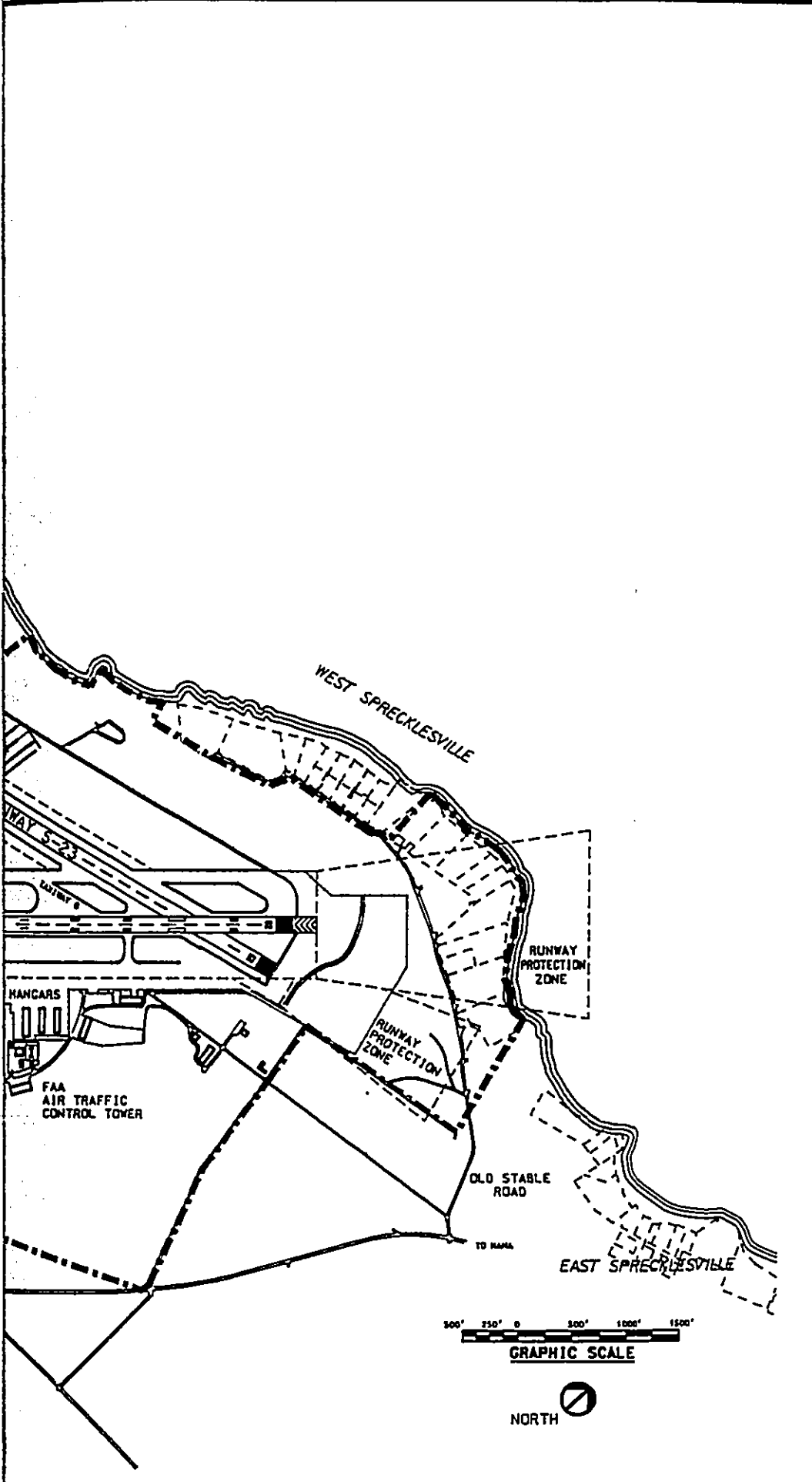
- Coastline. See Section 5.2.
- Kanaha Pond Wildlife Refuge. See Section 6.1.
- Flora and fauna. See Sections 6.1 and 6.2.
- Historical and cultural resources. See Section 6.3.
- Population. See Section 7.1.
- Highway system. See Section 8.1.

### 3.2.2 OVERVIEW OF EXISTING AIRPORT FACILITIES

The existing Airport facilities are located on both the western and eastern sides of Runway 2-20 as shown on Figure 3.2.3. The facilities on the western side of Runway 2-20 include the main passenger terminal, commuter terminal, ground transportation area, cargo facilities, and other airport-related facilities. Facilities on the eastern side of Runway 2-20 are for general aviation, cargo, helicopter, scenic air tour, and other miscellaneous airport support activities.







AIRPORTS DIVISION  
DEPARTMENT OF TRANSPORTATION

PACIFIC PLANNING &  
ENGINEERING, INC.  
BELT COLLINS & ASSOCIATES  
AMES CONSULTANTS LTD.

FIGURE 3.2.3

PROJECT TITLE:  
KAHULUI  
AIRPORT  
E.I.S.

PROJECT NO.:

SHEET TITLE:  
EXISTING  
CONDITIONS

DATE:	SHEET NO.:
JULY 1992	
25	

### 3.2.2.1 Runways and Taxiways

Kahului Airport has two existing runways. Runway 2-20 is 7,000 feet long and 150 feet wide. Runway 2-20 is used by all overseas flights and for nearly all of the interisland jet aircraft operating at the Airport. Runway 2 is equipped with an instrument landing system for precision instrument approaches, making it suitable for all-weather operations. Due to the existing pavement strength, the maximum allowable takeoff weight for widebody aircraft has been set at 405,000 pounds for aircraft such as the L-1011 and the DC-10-10 that are equipped with dual tandem landing gear; DC-10-30 aircraft, which have an additional landing gear beneath the main fuselage, are allowed to operate at gross takeoff weights up to 430,000 pounds.

Runway 5-23 is 4,990 feet long and 150 feet wide. It is used by air taxi/commuter aircraft and general aviation aircraft. It is capable of accommodating lightly loaded interisland jet aircraft, but it is normally used for that purpose only when Runway 2-20 is not available.

### 3.2.2.2 Facilities on the Western Side of the Airport

The majority of the facilities are located on the western side of the Airport. When ongoing construction projects are completed (scheduled for mid-1992), the main passenger terminal will contain approximately 480,000 square feet of space and 20 aircraft gate positions. There are approximately 2,000 vehicle parking spaces for passengers and airport employees in the parking lots near the passenger terminal building. The commuter/air taxi terminal, air cargo facility, VORTAC, aircraft rescue and fire fighting (ARFF) facility, and airline ground equipment maintenance building are located north of the passenger terminal. A small fuel storage tank owned by Hawaiian Airlines is situated south of the terminal. The ground transportation subdivision (where all of the on-airport rental car baseyards are located) is just west of the parking area. Airport support uses and commercial activities are located along the main entrance road to the Airport (Keolani Place).

### 3.2.2.3 Facilities on the Eastern Side of the Airport

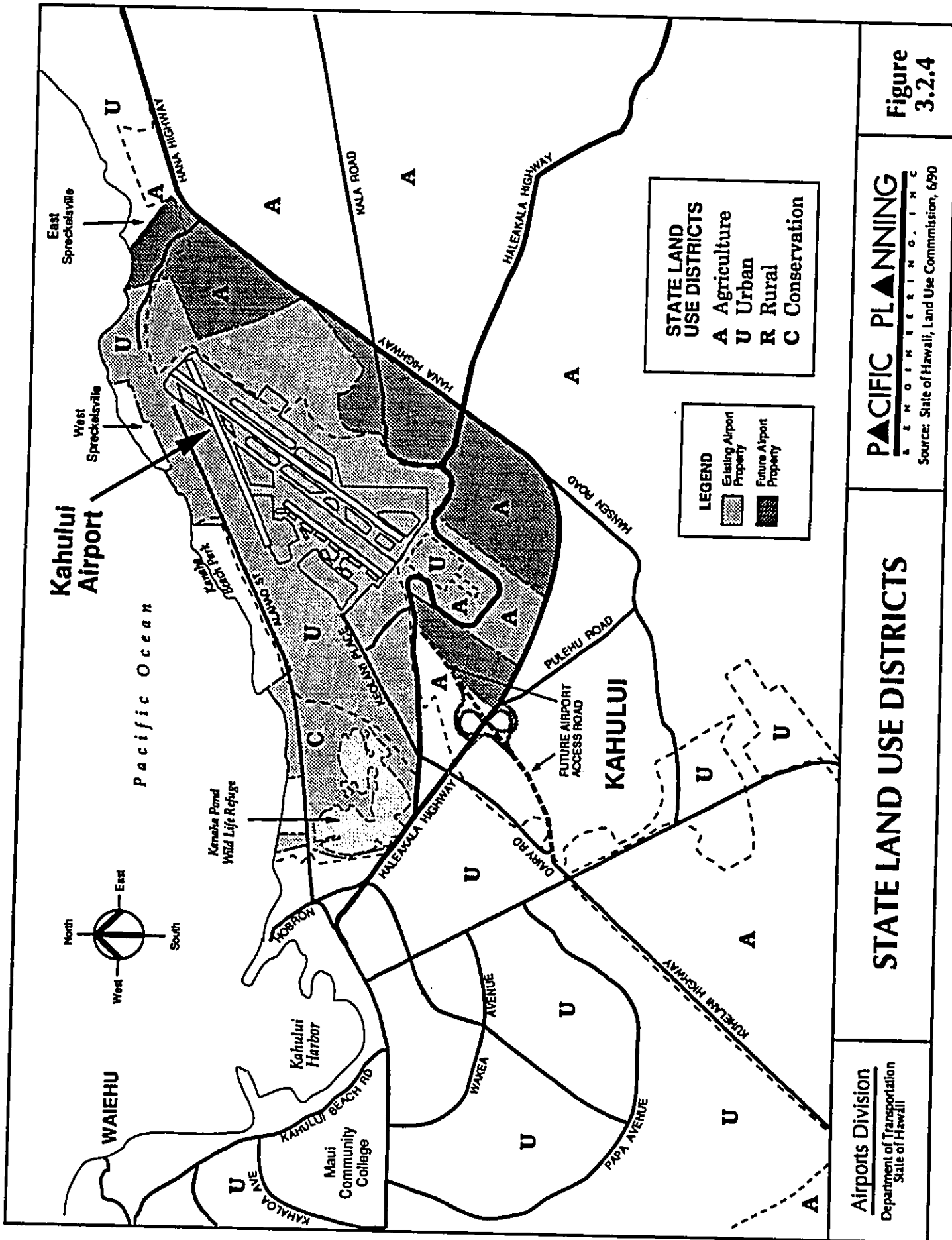
Hangars and apron space for general aviation aircraft, apron space for scenic air tour aircraft, and apron areas and hangars for helicopters are located on the eastern side of the Airport. The airport surveillance radar (ASR), fixed base operator and fuel supplier facilities, the FAA Air Traffic Control Tower, National Weather Service, and a few miscellaneous structures are also located there. All of the on-airport fuel storage tanks are filled by trucks that deliver the fuel from bulk storage tanks located near Kahului Harbor. Refueling air carrier aircraft on the apron in front of the passenger terminal requires tanker trucks to cross active runways, a practice that is undesirable.

### 3.2.3 EXISTING LAND USE DESIGNATIONS

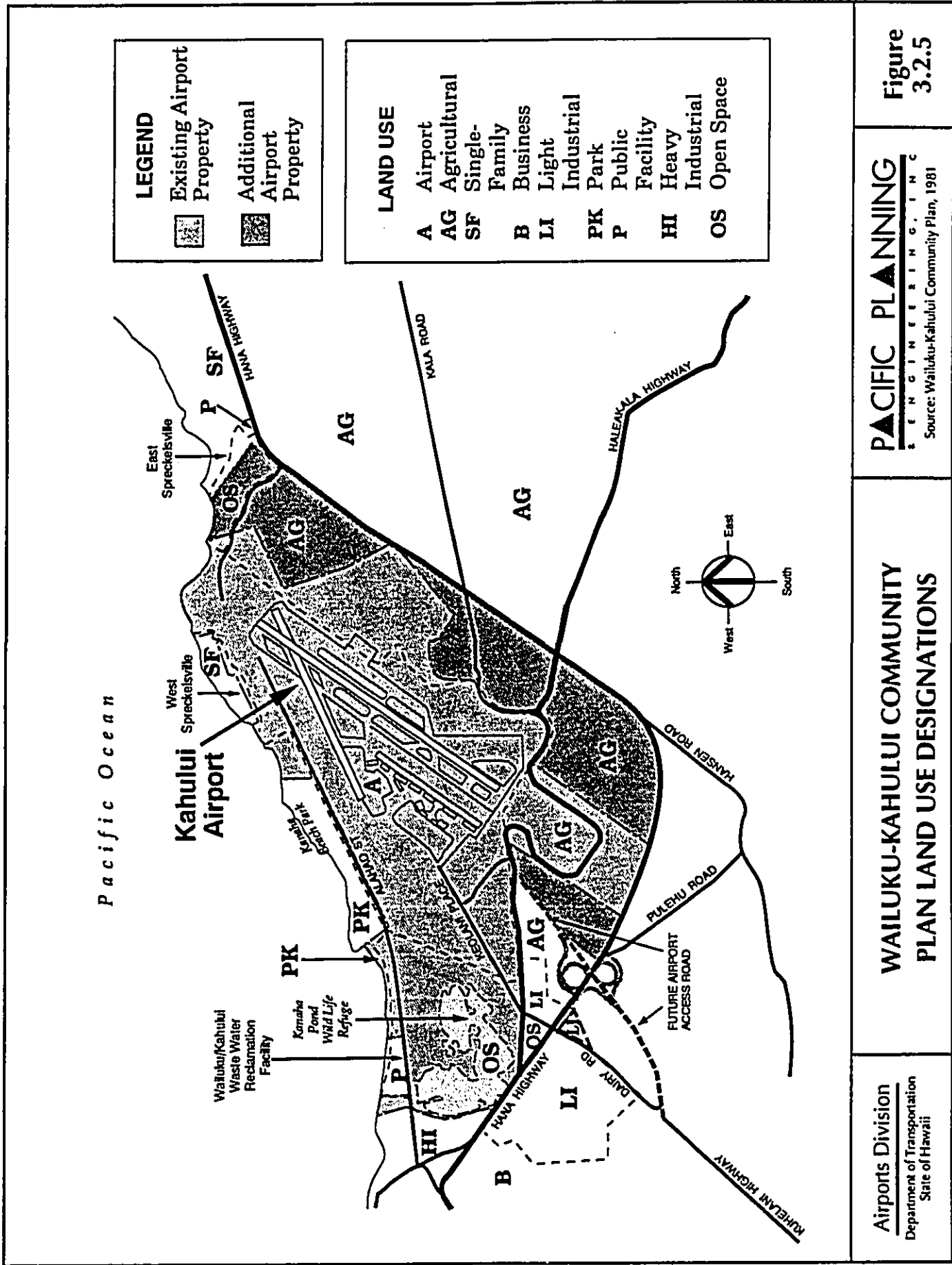
The existing State Land Use District boundaries and the Wailuku-Kahului Community Development Plan land use designations for Kahului Airport and surrounding areas are shown on Figures 3.2.4 and 3.2.5, respectively. As shown on Figure 3.2.4, most of the land within the present Airport boundaries is in the State Urban District. The exceptions are the Kanaha Pond Wildlife Refuge, which is in the Conservation District, and an area between the extended runway safety area south of Runway 2-20 and Hana Highway, which is in the Agricultural District. Maui County designates Kahului Airport as an Airport District similar to the Wailuku-Kahului Community Development Plan land use designation shown on Figure 3.2.5.

## 3.3 FACILITY REQUIREMENTS IDENTIFIED IN THE KAHULUI AIRPORT MASTER PLAN UPDATE STUDY

As previously stated, the overall objective of the State's facility planning at Kahului Airport is to provide safe, efficient, and economical air transportation services to the State's residents and visitors. The Master Plan Update Study identified the specific kinds of facilities that are needed to accomplish this goal. These "facility requirements" are described below.







**LEGEND**

Existing Airport Property

Additional Airport Property

**LAND USE**

A Airport

AG Agricultural

SF Single-Family

B Business

LI Light Industrial

PK Park

P Public Facility

HI Heavy Industrial

OS Open Space

Airports Division  
Department of Transportation  
State of Hawaii

**WAILUKU-KAHULUI COMMUNITY  
PLAN LAND USE DESIGNATIONS**

**PACIFIC PLANNING**  
ENGINEERING, INC.  
Source: Wailuku-Kahului Community Plan, 1981

**Figure 3.2.5**

### 3.3.1 AIRFIELD REQUIREMENTS

The FAA's National Plan of Integrated Airport Systems classifies Kahului Airport as a "Commercial Service-Primary Airport" serving long-haul air carrier routes of over 1,500 miles. The Airport currently meets the FAA criteria for Airplane Design Group V, i.e., aircraft with wing spans of up to 197 feet. This includes widebody aircraft such as the DC-10 and L-1011 which currently use the Airport on a regular basis, as well as larger aircraft, including most B-747 variants.

#### 3.3.1.1 Runway Length

The desirable length of the longest runway that is needed at Kahului Airport is a function of both the types of aircraft that are expected to use it and of the stage lengths (i.e., non-stop distances) they are expected to fly. Aircraft flying longer routes normally require a greater distance to take off than they need to land; hence, it usually is the distance that aircraft need to take off rather than the distance that arriving (landing) aircraft need that establishes the runway length requirement. Generally, the length of runway that is needed for a particular type of aircraft (e.g., B-737-200, DC-9-50, DC-10-10, L-1011, etc.) is dependant on its takeoff weight (which, in turn, is determined by the amount of fuel it must carry to reach its destination and to the number of passengers, amount of baggage, and volume of cargo that are on-board).

Runway 2-20's 7,000-foot length is marginal for the aircraft that the three overseas airlines flying between Maui and the Mainland are now using (DC-10s by American and United Airlines and L-1011s by Delta Airlines). Because of the limited runway length and pavement strength, neither United nor Delta can carry a full load of passengers and cargo on non-stop departures to California, and do not fly non-stop at all between Maui and points beyond the West Coast. The payload limitations imposed by the runway length and pavement strength have contributed to American Airlines routing all of its Maui departures through Honolulu International Airport for refueling.

By flying with limited payloads, or routing their aircraft to Oahu, where they can refuel at Honolulu International Airport (which has a longer runway), the airlines consume more fuel and/or incur higher operating costs than would be the case if a longer runway were available. Thus, from the airlines' perspective, and probably from the perspectives of the traveling public and cargo shippers as well, there are several valid reasons (potentially lower air fares, shorter travel time, lower operating costs, and increased operating capabilities) to extend the runway at Kahului Airport to better serve existing markets.

The runway length needed to allow air carrier aircraft to operate with a reasonable degree of payload efficiency depends upon the destination (market) to be served and upon the types of aircraft that will be used for the service. During the course of the Kahului Airport Master Plan Update Study the following basic runway length options were identified.

Existing 7,000-foot Runway Length. A runway length of 7,000 feet (the existing length) would allow continuation of the present "payload limited" service by overseas air carriers so long as the economics of airline operations do not change. This "status quo" alternative could lead to a reduction in service if airlines find alternative, more profitable uses for their aircraft. On the other hand, the existing length could become somewhat less of a hindrance to passenger service if airlines are able to put aircraft with shorter runway requirements (such as the B-757 and B-767) into service on the route; such a conversion would not help cargo shipments, however, since these aircraft typically have a lower cargo-carrying capacity than the aircraft which they would replace. A 7,000-foot length would also continue to accommodate interisland jet aircraft (passenger and cargo), military training operations, and most (but not all) of the general aviation activity that can be anticipated (only a very few of the largest business jets might face destination and/or payload limitations at this length).

8,500 Foot Runway. A runway length of 8,500 feet would allow essentially unrestricted operations by all aircraft likely to be used on non-stop flights between Kahului and the West Coast; it would also allow operations as far as Denver with payload restrictions. This is the length needed to provide the most economically efficient non-stop service between Maui and the West Coast.

9,600 Foot Runway. A runway length of approximately 9,600 feet would allow essentially unrestricted operations by all aircraft likely to be used to provide non-stop passenger service between Kahului and the Mid-West (e.g., Dallas-Fort Worth, Denver, Chicago, etc.). It would also permit economic non-stop flights to Japan, although in the absence of International Arrivals Facility - not planned through 2010 - and a new bilateral agreement between Japan and the U.S. no such flights would be possible on a regularly scheduled basis.

10,500 Foot Runway. A runway length of 10,500 feet would allow essentially unrestricted operations by all aircraft likely to be used on non-stop flights from Kahului Airport to the East Coast (e.g., New York and Atlanta), and permit economic non-stop flights to other Pacific Rim destinations. Such unrestricted operations to other Pacific Rim destinations are conditioned on the same limitation (i.e., the absence of an International Arrivals Facility) as the 9,600 foot runway option.

Because of the wide variation in aircraft performance characteristics, these runway length/non-stop distance relationships are generalized. Contrary to popular misconception, there is not a direct or simple relationship between an aircraft's size and the runway length that it needs. Some large modern aircraft, such as the B-747-400 series, are able to carry large payloads for long distances from relatively short runways. And some of the newer generation of mid-size aircraft (such as the B-757, B-767, and MD-11) require less runway length than the older aircraft (such as the L-1011 and DC-10) which they are replacing. Nonetheless, the options noted above provide a general indication of the markets that each runway length might reasonably serve.

Based on its review of these options, DOT determined that a runway length of approximately 9,600 feet would best meet the passenger and air cargo service needs through 2010.

The shortest of Kahului Airport's two existing runways (Runway 5-23) is 4,990 feet. This is sufficient for small general aviation, air taxi, and commuter aircraft. The interisland jet aircraft that use the Airport (B-737 and DC-9) are capable of operating from the runway only if they are not fully loaded. Runway 5-23 is too short to accommodate the kinds of aircraft used in overseas service (DC-10 and L-1011) either for takeoff or landing.

Since Runway 5-23 and Runway 2-20 intersect, they cannot always be used at the same time. Hence, an extension of Runway 5-23 to the southwest would be useful if it provided for more simultaneous, independent approaches to Runways 2 and 5, or if it substantially increased the capabilities of interisland jet aircraft. Since the approach and departure paths associated with Runway 5-23 are less desirable than those associated with Runway 2-20 and the wind coverage for air carrier aircraft is not significantly improved by Runway 5-23, the primary justification for an extension to this runway would be for the backup capability that it would provide. The Airline Pilots Association believes the backup capability is desirable, particularly since it would slightly improve the crosswind situation. However, the gain is marginal, and DOT has decided that the potential beneficial effects that an extension to Runway 5-23 might provide are outweighed by the adverse impacts that it could have on the Kanaha Pond Wildlife Refuge and/or East Spreckelsville. Hence, an extension to Runway 5-23 was not recommended as part of the Master Plan Update Study.

#### 3.3.1.2 Additional Runways

Forecasts made as part of the SASP and the Kahului Airport Master Plan Update Study indicate that the number of aircraft operations at the Airport will exceed the capacity of its existing runways sometime after the year 2000. Analyses conducted for the Master Plan Update Study conclude that

the resulting congestion could force most general aviation local training activity away from the Airport and lead to an increase in the average aircraft size and load factors of interisland and overseas air carriers. It could also cause substantial flight delays, with a consequent impact on the operating costs and schedule performance of the air carriers serving the Airport. However, the analysis indicates that the congestion would not be so severe as to prevent the SASP air carrier passenger forecasts from being achieved.

If the delays and displacement of general aviation activity are to be avoided, a new runway will need to be constructed. In order to allow simultaneous air carrier aircraft operations, the additional runway would have to be parallel to, and at least 2,500 feet to the east of, Runway 2-20.

A parallel runway length of at least 3,500 feet would serve general aviation aircraft and would provide the additional airfield capacity needed to avoid high aircraft delays and the displacement of general aviation local (training) flights that is anticipated if no improvements are made. A longer parallel runway (7,000 to 10,500 feet) would not only accommodate all of the aircraft operations forecast for 2010, it would also provide a much-needed backup capacity that would prevent runway maintenance activities and accidents from closing the Airport to jet air carrier and military aircraft.

Extensions to Runway 2-20, as well as a parallel runway of any length, would require new and extended taxiways and, in the case of parallel runways, connecting taxiways as well. A short parallel runway (3,500 feet) could be served adequately by a single connecting taxiway, but a longer parallel runway would require two. New taxiways would also be needed to serve any additional apron areas that are provided.

If a parallel runway is constructed, it would provide sufficient capacity to accommodate all of the forecast operations for well beyond the 2010 time horizon of the Master Plan Update Study. Thus, from only a capacity standpoint, it would be possible to close the intersecting runway (Runway 5-

23), and use the area that is now constrained by its presence for other airport purposes. This would somewhat reduce the crosswind coverage that is provided, particularly for small aircraft and would increase the mixture of small general aviation aircraft and large air carrier aircraft operating on Runway 2-20 and the parallel runway. In addition, it is sometimes used by interisland air carrier jet aircraft because of weather conditions. For these reasons, DOT does not believe that Runway 5-23 should be closed.

### 3.3.1.3 Runway and Taxiway Width Requirements

The existing runway and taxiway widths at Kahului Airport (150 feet and 75 feet) are adequate for all of the aircraft in Design Group V (i.e., B-747 aircraft). Hence, they will not require upgrading regardless of the runway improvements that are made.

### 3.3.1.4 Runway Protection Zones

Formerly called "clear zones", runway protection zones are designed to insure that structures do not encroach on the critical portions of the airspace that are close to the runway ends. FAA regulations call for the airport owner (DOT) to have positive control over development within the runway protection zones, either by ownership and/or long-term aviation easement. Given the continuing need to accommodate air carrier aircraft at Kahului Airport, it is important to maintain 2,500-foot-long precision instrument runway protection zones and 50:1 approach surfaces for Runways 2 and 20, and for any jet aircraft capable parallel runway that might be constructed.

Runway 5-23 has 1,700-foot-long non-precision runway protection zones and 34:1 approach surfaces. Analyses conducted for the Kahului Airport Master Plan Update Study indicate that based on the most precise approach procedure, only visual runway protection zones with a 20:1 approach slope are absolutely required. However, in view of the occasional use of this runway by interisland air carrier jet aircraft and the desire to preserve the

current level of safety, DOT has decided to maintain the existing 1,700-foot runway protection zones.

#### 3.3.1.5 Runway Safety Areas

FAR Part 139 requires that, to the extent practicable, airport operators must provide a runway safety area for each runway and taxiway available for air carrier use. Because the existing runways at Kahului Airport predate the effective date of the regulations (January 1, 1988), they are not immediately regulated by them. Nonetheless, their establishment remains a desirable goal.

A 1,000-foot long by 500-foot wide safety area has recently been constructed on the approach to Runway 2. The other runways at Kahului Airport do not have officially designated runway safety areas at the present time. However, 1,000-foot by 500-foot areas off the ends of the other runways are kept open and grassed. Only minor improvements to these are needed to bring them up to full FAA standards, and analyses performed for the Kahului Airport Master Plan Update Study suggest that these improvements should be made. Because Runway 5-23 accommodates mostly commuter/air taxi and general aviation aircraft, which are smaller than the jet air carrier aircraft using Runway 2-20, a smaller (600 feet by 300 feet) runway safety area would suffice if economic or other factors made the larger area infeasible.

#### 3.3.1.6 Airfield Pavement

Most of the runways and taxiways at Kahului Airport were constructed many years ago. As a result, they were not designed with the weights of modern jet aircraft in mind. Moreover, decades of use have taken a toll on the sub-grade of the runway. Pavement distress has been noted on Runway 2-20 and on some of the older portions of Taxiway A, and emergency repairs have been made to the affected areas. Pavement analyses conducted for DOT indicate that the distress is the result of slippage between pavement layers caused by the braking and turning action of aircraft after they land



and exit Runway 2-20. The analysis also concluded that the distress would continue unless corrective action was taken. As a result of the observed problems, the Airport has established 405,000 pounds as the maximum gross take-off weight for DC-10-10 and L-1011 type aircraft (both of which have dual tandem landing gear). The limit for DC-10-30 series aircraft is 430,000 pounds because it has one more tandem landing gear than the DC-10-10 series aircraft.

Harding Lawson Associates has analyzed the pavement improvements that would be needed to eliminate the accelerated wear that is being observed on Runway 2-20 and other older sections of pavement. They concluded that the problem could be corrected by a pavement overlay. The thickness of the overlay is a function of the type of aircraft and the ultimate length of the runway (length is a factor because it affects possible non-stop distances/fuel loads). The Harding Lawson Associates report recommended the following:

<u>Design Aircraft</u>	<u>Aircraft Weight and Runway Configuration</u>	<u>Strengthening Overlay (in)</u>
DC-10 and L-1011	Maximum gross weight and unlimited runway length	8.0
B-747-400	Maximum gross weight and unlimited runway length	9.5
DC-10 and L-1011	Existing runway length (7,000 feet)	6.0

Note that the pavement thickness required is a function of the type and operating weight of the aircraft that are expected to use the runway. The required overlay thickness is less for the 7,000 foot runway length alternative because the shorter runway length will restrict the maximum allowable weight of aircraft taking off from the Airport.

### 3.3.1.7 Navigational and Landing Aids

Analyses conducted for the Master Plan Update Study indicate that the existing navigational aids and instrument flight rules (IFR) minimums at the Airport are adequate for the existing runways. They also show that high intensity runway lights and visual glide slope indicators should be provided on any runway extension and/or parallel runway. In addition, the analyses point to the desirability of providing medium intensity taxiway lights on all new taxiways and installing an omni-directional approach lighting system for Runway 20. If Runway 2-20 is extended to the south, it will be necessary to relocate the precision instrument approach system (glide slope facility, middle marker, and approach lights). If the runway is extended towards the north, the localizer will have to be relocated as well.

If a parallel runway capable of accommodating air carrier aircraft is to be constructed, the precision instrument approach system could be relocated to the new Runway 2R.

### 3.3.2 PASSENGER TERMINAL COMPLEX

#### 3.3.2.1 Air Carrier Aircraft Parking Aprons

Aircraft parking aprons are needed that have sufficient space and structural strength to accommodate the anticipated aircraft volumes and types. The requirements are a function of the number of aircraft (by type) that are expected to be on the ground at any one time and the facilities which they need to access. The pavement strength of the existing air carrier aprons is adequate for all of the aircraft expected to use the Airport through the year 2010.

Analyses conducted as part of the Master Plan Update Study indicate that, assuming an optimal mix of interisland and overseas aircraft, as well as efficient ground handling and a minimum of delays as a result of system capacity constraints (e.g., situations where aircraft are held on the ground in Kahului because of capacity constraints at the aircraft's destinations), the existing passenger terminal apron space will be adequate through the 2010 forecast year.

### 3.3.2.2 Passenger Terminal Building

When the improvements now under construction are completed, the passenger terminal complex will contain approximately 480,000 square feet of building space. Analyses performed as part of the Master Plan Update Study indicate that this space will be sufficient to accommodate the forecast level of activity through the year 2010. They also indicate that additional land adjacent to the passenger terminal should be reserved for possible future expansion after 2010.

There is no non-stop international service to Kahului Airport. Instead, passengers from foreign countries enter the State through Honolulu International Airport, where the Federal Inspection Services (U. S. Customs, Immigration and Naturalization, Agriculture, Public Health, and Fish and Wildlife) facilities and staff are located. DOT has decided that it will not provide such facilities for regularly scheduled international flights at Kahului Airport. However, because foreign landing rights are under the jurisdiction of the Federal government, the State does not have control over this component of Airport activity.

### 3.3.2.3 Commuter Airlines Facilities

Analyses conducted as part of the Master Plan Update Study indicate that the 240,000 square feet of apron space and 12 existing aircraft parking spaces on the apron fronting the Commuter Airline Terminal far exceeds the forecast need through the year 2010. The 8,000 square feet of space in the terminal building is also adequate through the planning horizon. They

also show that it would be feasible to relocate these facilities to the main terminal building, if the present site were needed for other Airport purposes.

#### 3.3.2.4 Scenic Air Tour Aircraft Facilities

Up to 20 fixed-wing sightseeing aircraft can park on the portion of the East Ramp that is reserved for them. Forecasts indicate that space for as many as 30 aircraft could be needed by 2010. Only a modest "terminal" containing restrooms, a small lounge, and food and beverage vending machines is needed.

#### 3.3.3 TRANSIENT AIRCRAFT PARKING APRON

Both large and small transient aircraft (i.e., aircraft that are not based at the Airport but which stay there for various periods of time) use Kahului Airport and require apron space. The smaller aircraft can be accommodated on the existing East Ramp, and additional apron space for them can be provided in this area as necessary. Large transient aircraft, such as military transports and chartered commercial airliners, occasionally spend periods of time at Kahului ranging from a few hours to a few days. Space for these is needed elsewhere.

#### 3.3.4 CARGO FACILITIES

Air cargo arrives and departs Kahului Airport in the holds of passenger aircraft (e.g., B-737, DC-9, L-1011, and DC-10), on all-cargo jet freighters (B-737QC), and on smaller all-cargo aircraft such as the Cessna 208 Caravan and Cessna 402. It is forecast that a total of 59,000 tons per year will need to be accommodated by 2010. This is substantially more than can be handled in the existing cargo facilities, which are already under-sized. Hence, additional building, apron, and vehicular parking space will be needed.

### 3.3.5 GENERAL AVIATION FACILITIES

Forecasts prepared as part of the Master Plan Update Study indicate that as many as 75 aircraft will be based at Kahului Airport by the year 2010. The existing facilities are already unable to meet the space needs of general aviation aircraft owners and operators, and accommodating the increased demand will require significant increases in hangar and apron space.

Some of the general aviation operators favor relocation away from Kahului Airport. They view relocation as a means of avoiding increasing airspace congestion at Kahului Airport and some of the limitations and problems of sharing an airport with air carrier aircraft. Relocating general aviation facilities to a portion of the old Puunene Airport site has been explored with the FAA, but has received an unfavorable response to date because of the potential conflicts with Kahului Airport aircraft activity. Because of this, DOT has determined that space for general aviation activities should continue to be provided at the Airport. At least 20 additional T-hangar spaces, associated apron areas, and support facilities are needed to serve this purpose. DOT will continue to explore long-term alternatives to this, however.

### 3.3.6 COMMERCIAL AVIATION/FIXED BASE OPERATOR FACILITIES

There is presently a shortage of hangar, office and apron space suitable for commercial aviation operations. As a result, operators have been unable to develop the kinds of support facilities that they need. Potential occupants of such space include fixed-base operators, air taxi services and commuter airlines. Analyses for the Master Plan Update Study indicate an immediate need for several developable parcels of at least one to two acres each for this purpose; these could be located adjacent to the East Ramp and have taxiway access to the airfield. The DOT property development standards require certain minimum improvements for commercial aviation/ fixed base operators, including a 10,000 square foot hangar and maintenance shop, 1,000 square feet of office space, and 40,000 square feet of

paved apron area with access to the hangar. Experience at Kahului and other neighbor island airports has shown the need for smaller parcels as well.

### 3.3.7 HELICOPTER FACILITIES

As noted above, helicopter operators at Kahului Airport have developed maintenance hangars and passenger reception areas on the pavement of abandoned Runway 17-35 at the southern end of the East Ramp. Some of the hangars block the view of the helicopter apron from the FAA Air Traffic Control Tower, creating an undesirable situation. The existing location will become even less desirable for helicopter operations if a parallel runway is constructed because it will lead to a large number of cross-runway operations by arriving and departing helicopters. Thus, an off-Airport site is needed if a parallel runway is constructed. Environmental evaluation of alternate sites will be the subject of a separate study and EA/EIS.

### 3.3.8 FLIGHT KITCHEN FACILITIES

Flight kitchens are used to prepare meals for aircraft which provide in-flight meal service. At Kahului Airport this means aircraft that are flying non-stop to the West Coast. These facilities are normally constructed and operated by a private company, under contract to the airlines they serve. They can be located off-airport, as is currently the case at Kahului. However, there are operating efficiencies associated with an on-airport location, and DOT has decided to provide a site at the Airport. Approximately two acres of land are needed, and it is anticipated that the building housing the flight kitchen would have up to 30,000 square feet of gross leasable area.

### 3.3.9 AIRLINE GROUND EQUIPMENT MAINTENANCE FACILITIES

The airlines are presently conducting most of their ground equipment maintenance work in a wooden structure located at the northern end of the air carrier aircraft apron. The location is convenient, but the structure is substandard, and the building extends across the building restriction line. New space for this purpose is needed.

The airlines have indicated a desire for a one-acre plot on which they would construct a 12,000 square-foot building for this purpose. The land around the building would be paved and used for equipment and vehicle parking. Tractor-trailer trucks must be able to access the ground side of the building on an infrequent basis to deliver repair machinery and materials, and parking for approximately 20 vehicles is needed. The site must have non-public access to the airside for the airline ground support equipment, much of which has limited ground clearance and cannot negotiate steep grades. Proximity to the airlines' other activities is an advantage, but not essential. The facilities should be located on the same side of the airfield as the passenger terminal and air carrier aircraft parking aprons so that vehicles do not have to cross the active runway. A service road should connect it to the main air carrier aircraft activity areas. Ideally, it would be visually screened from areas of high passenger activity.

### 3.3.10 BULK JET FUEL STORAGE FACILITY

At the present time, the facilities available for fuel storage at the Airport are limited. The interisland air carriers normally refuel in Honolulu, where delivered fuel prices are considerably lower than at Kahului. Overseas air carriers do refuel aircraft at the Airport, with United Airlines (which flies the most non-stop flights to the Mainland) being the largest consumer. Currently, it is transported from the fuel storage facilities at Kahului Harbor by trucks under contract to the individual airlines. Since there are no large on-site tanks or on-apron fuel hydrants in service at the present time, the fuel is loaded from the delivery trucks directly onto the aircraft.

With the forecast increase in the number of non-stop overseas flights to the Mainland, on-site storage, with delivery to the air carrier apron by truck or underground pipeline, is likely to become more economical than the current arrangement. Based on the forecast growth in overseas air carrier departures from Kahului Airport, a study prepared on behalf of the Honolulu Fueling Facilities Corporation (the airline consortium that handles fueling for the airlines at Honolulu International Airport and has proposed building and operating storage and handling facilities at Kahului Airport) has asked that a 2-acre site (with an additional acre in reserve) be provided for fuel storage facilities. An underground pipeline would connect the storage tank with a hydrant system already partially installed beneath the air carrier apron. Their plans envision the possibility that fuel may eventually be delivered to the storage facilities by a pipeline running either mauka or makai of Kanaha Pond, but assume that when the storage tanks first go into service they may be filled by tank trucks.

### 3.3.11 ACCESS ROAD/GROUND TRANSPORTATION

#### 3.3.11.1 West Side Access

At present, the main roadway access to the west side of the Airport is via Keolani Place. Vehicles can also reach the passenger terminal area from Alahao Street on the makai side of the Airport (via Koeheke Street), but volumes on this route are low. The ability of the intersections to accommodate the forecast traffic volumes was analyzed using procedures outlined in the 1985 edition of the Highway Capacity Manual. Key off-airport intersections are already congested, and the capacity of all three signalized intersections directly affected by Airport-related traffic (Hana Highway/Dairy Road, Kuihelani Highway/Puunene Avenue, and Hana Highway/Haleakala Highway) will need to be increased to accommodate expected increases in traffic. It is worth noting that the Airport is only a minor contributor of traffic at several of these intersections, with the over-capacity situation resulting largely from regional traffic flows during peak traffic hours.



In order to accommodate the forecast traffic volumes, it will be necessary to provide additional roadway capacity or to decrease the number of vehicular trips that are made by both Airport and non-Airport vehicles. DOT has proposed alleviating the congestion by constructing a new Airport Access Road with an interchange at its intersection with Hana Highway. This is the design that was recommended by the 1988 Kahului Airport Development Plan and it has been a part of all DOT's subsequent planning efforts. This access road would provide for the free (i.e., unsignalized) movement of vehicles from Kuihelani Highway and Hana Highway into and out of the Airport. Keolani Place would remain in place, and it would provide an alternate route in case of accidents and/or obstruction on the new access road, as well as a more direct route for vehicles traveling between Kahului (particularly the industrial areas) and the Airport. Separate road access for trucks moving to and from air cargo facilities is also desirable.

#### 3.3.11.2 Alahao Street/Old Stable Road Connection

At present, Alahao Street, which serves the coastal area on the western side of the Airport does not connect with Old Stable Road. (The latter provides access to West Spreckelsville and to shoreline areas on the eastern side of the Airport). A number of parties have suggested that they be linked to provide a through route along the entire seaward side of the Airport. This would provide vehicles traveling between Kahului town and the Hana Coast an alternate route. However, in doing so, it would channel a substantial amount of traffic through the Kanaha Park area, which is intended principally for recreational use.

Based on comments received during the course of the Master Plan Update Study, the State has decided not to connect the two roads on a permanent basis. However, it is considered desirable to provide such a connection during emergency situations. This would minimize adverse impacts on recreational activity along the Kanaha shoreline, while providing an alternate route in the event of problems with the main roadways (e.g. Hana Highway). Provision of a bikeway in this area along the makai side of the

Airport is also desirable.

#### 3.3.11.3 New East Ramp Access Road

The kinds of activities that are being considered for the East Ramp generate relatively little traffic. Hence, from a capacity standpoint, the existing two-lane roadways are adequate. However, Haleakala Highway, the principal access road to the East Ramp would need to be closed if Runway 2-20 is extended further to the south or if a parallel runway is constructed. In the case of a parallel runway, it would also be necessary to construct a new spine road between the two runways. Ideally, this would run the entire length of the area between the runways, connecting with Hana Highway on the south and with Old Stable Road on the north. However, a single connection at the southern end would suffice.

#### 3.3.11.4 Parking

The passenger terminal parking area at Kahului Airport has been greatly expanded as part of work on the new passenger terminal. It now contains a total of 1,917 stalls. Estimates suggest a possible need to increase that to 2,300 parking stalls by 2010.

The County of Maui has expressed a strong interest in discouraging the use of private automobiles for travel to and from the Airport, and DOT has agreed to take what steps it can to encourage greater use of public transit. If these efforts are successful, the existing parking facilities may be adequate through the 2010 planning period. However, if the number of vehicles continues to rise at the historic rate, approximately 400 additional parking stalls will be required to meet the forecast demand. The additional parking stalls should be constructed as close as possible to the facilities that they will serve.

### 3.3.11.5 Other Ground Transportation Facilities

In view of the forecast increase in passenger volumes, as many as 20 additional acres for ground transportation baseyard facilities will be needed. These can be either on or off the Airport, with an on-airport location being preferable.

### 3.3.11.6 Hana Highway Realignment

A very short parallel runway configuration (3,500 feet) could be constructed without any changes to Hana Highway (except for the possible new East Ramp access road intersection mentioned in Section 3.3.11.3, above). For longer parallel runways, it would be necessary to realign Hana Highway so that it runs generally parallel to the new runway for its entire length, rather than swinging to the west, as is now the case. The modification would affect approximately two-thirds of a mile of roadway and would require acquisition from Alexander and Baldwin, Inc. of a small amount of land on which sugarcane is currently being cultivated. The longest runway length considered for the parallel runway (10,500 feet) would require a major realignment of Hana Highway off the southern end of the parallel runway.

### 3.3.12 U.S. POST OFFICE AND RAMP ACCESS ROAD

The U.S. Postal Service owns a vacant parcel of land adjacent to Keolani Place and plans to develop a major postal facility there. The site has good access to Keolani Place, and current plans call for DOT to provide a dedicated road between the facility and the passenger terminal apron so that vehicles carrying mail from the facility to and from aircraft do not have to pass through a fence.

### 3.3.13 KANAHA BEACH PARK IMPROVEMENTS

DOT has prepared preliminary plans for additional recreational facilities along the Kanaha Beach shoreline. The facilities would be on the makai side of Alahao Street to the East of Maui County's Kanaha Beach Park. This facility is not essential to Airport operations, but DOT has indicated a strong interest in implementing these plans so long as they do not interfere with existing or future Airport operations.

### 3.3.14 MAUI COUNTY BASEYARD

The County of Maui has asked that between 10 and 15 acres of space be provided on the Airport for a County Baseyard for vehicles and other equipment. DOT has agreed to attempt to comply with this request if it can be done without compromising Airport operations. The County has indicated that the exact location of the site is not critical so long as it has adequate access to roads and utility systems and its development would not entail excessive site development costs.

### 3.3.15 ILLUSTRATIVE AIRPORT DEVELOPMENT CONCEPTS

A virtually infinite number of ways of laying out the various facilities needed to meet the requirements identified above are possible. To assist in the planning process, a series of airport layouts was prepared and used as the basis for discussions with airport users, government agencies and the general public. This analytic tool and process enhanced the ability of the public and decision-makers to understand the actions and their effects and to comment intelligently. Six of these development concepts are shown in Appendix K. They illustrate a wide range of possible approaches to airport development and were used to stimulate constructive discussions concerning the relative merits and drawbacks of different elements. DOT has drawn heavily on the ideas represented in those concept drawings and on the suggestions and comments that were made by persons reviewing them, in arriving at a recommended Airport Master Plan.

## 3.4 DESCRIPTION OF THE PROPOSED ACTION

The recommended Kahului Airport Master Plan is shown on Figure 3.4.1. It is based on the technical analyses that were performed as part of the Kahului Airport Master Plan Update Study, information and comments obtained during the public review of the Draft EIS, and policy decisions made by DOT. Brief descriptions of the improvements contained in the recommended plan follow below.

### 3.4.1 PHASE 1 (1992 to 1996)

The five actions that require FAA approval are recommended as Phase 1. Two additional actions that do not require such approval (i.e., construct Post Office Ramp Access Road and construct an additional cargo building) also are recommended for Phase 1.

3.4.1.1 Extend Runway 2-20 to 9,600 Feet. Runway 2-20 would be extended by 2,600 feet to the south to a total length of 9,600 feet. The extension would allow all aircraft now in regular service to take off fully-loaded for the West Coast. It would also allow these aircraft to fly non-stop to cities in the Mid-West (e.g., Chicago, Dallas-Fort Worth, Denver, etc.) with economic loads. More distant Mainland cities, such as New York, Atlanta, and Boston could be reached by some aircraft with some load restrictions<sup>1</sup>.

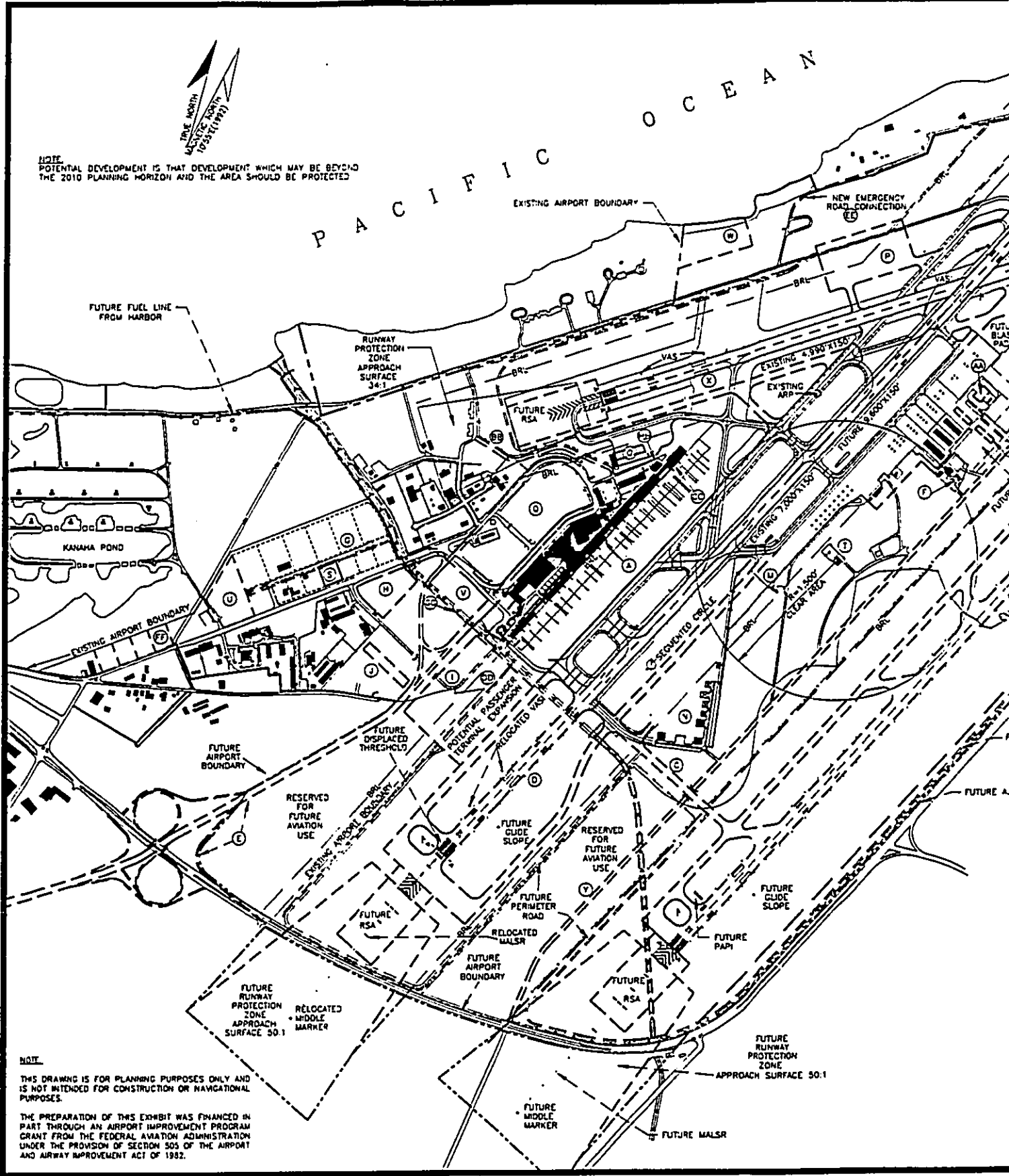
Under current law, this extension will require a change to the State Land Use District Boundary (from Agriculture to Urban) and an amendment to the Maui County General Plan. In order to maintain positive control over the property within the runway protection zone for the extended runway, DOT will acquire fee title or easements over the land on the south side of Hana Highway that is in the runway protection zone.

<sup>1</sup> A runway of this length would also allow non-stop flights from Maui to Far Eastern destinations such as Tokyo if route authority were granted. However, airlines would not use it for this purpose unless international arrival facilities were provided as well, and the recommended Airport Master Plan does not include such facilities.



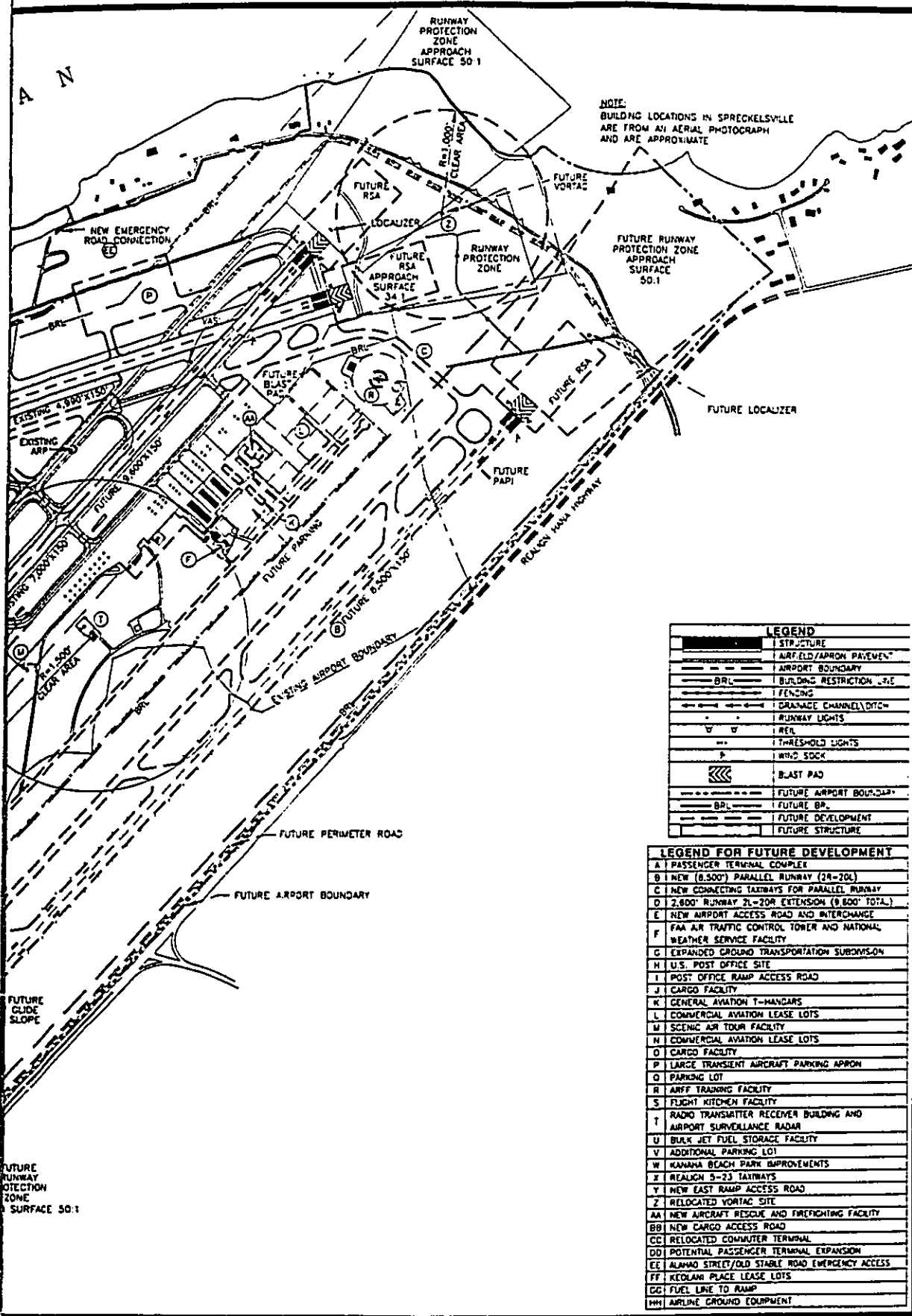
NOTE  
POTENTIAL DEVELOPMENT IS THAT DEVELOPMENT WHICH MAY BE BEYOND  
THE 2010 PLANNING HORIZON AND THE AREA SHOULD BE PROTECTED

P A C I F I C O C E A N



NOTE  
THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND  
IS NOT INTENDED FOR CONSTRUCTION OR NAVIGATIONAL  
PURPOSES.

THE PREPARATION OF THIS EXHIBIT WAS FINANCED IN  
PART THROUGH AN AIRPORT IMPROVEMENT PROGRAM  
GRANT FROM THE FEDERAL AVIATION ADMINISTRATION  
UNDER THE PROVISION OF SECTION 505 OF THE AIRPORT  
AND AIRWAY IMPROVEMENT ACT OF 1982.



Airports Division  
DEPARTMENT OF TRANSPORTATION  
STATE OF HAWAII

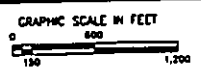
# KAHULUI AIRPORT MASTER PLAN

ISLAND OF MAUI

## AIRPORT MASTER PLAN

LEGEND	
[Symbol]	STRUCTURE
[Symbol]	AIRFIELD/APRON PAVEMENT
[Symbol]	AIRPORT BOUNDARY
[Symbol]	BUILDING RESTRICTION LINE
[Symbol]	FENCING
[Symbol]	DRAINAGE CHANNEL/DITCH
[Symbol]	RUNWAY LIGHTS
[Symbol]	REIL
[Symbol]	THRESHOLD LIGHTS
[Symbol]	WIND SOCK
[Symbol]	BLAST PAD
[Symbol]	FUTURE AIRPORT BOUNDARY
[Symbol]	FUTURE BRL
[Symbol]	FUTURE DEVELOPMENT
[Symbol]	FUTURE STRUCTURE

LEGEND FOR FUTURE DEVELOPMENT	
A	PASSENGER TERMINAL COMPLEX
B	NEW (8,500') PARALLEL RUNWAY (24-20L)
C	NEW CONNECTING TAXIWAYS FOR PARALLEL RUNWAY
D	2,800' RUNWAY 24-20R EXTENSION (8,600' TOTAL)
E	NEW AIRPORT ACCESS ROAD AND INTERCHANGE
F	FAA AIR TRAFFIC CONTROL TOWER AND NATIONAL WEATHER SERVICE FACILITY
G	EXPANDED GROUND TRANSPORTATION SUBDIVISION
H	U.S. POST OFFICE SITE
I	POST OFFICE RAMP ACCESS ROAD
J	CARGO FACILITY
K	GENERAL AVIATION T-MANGERS
L	COMMERCIAL AVIATION LEASE LOTS
M	SCENIC AIR TOUR FACILITY
N	COMMERCIAL AVIATION LEASE LOTS
O	CARGO FACILITY
P	LARGE TRANSIENT AIRCRAFT PARKING APRON
Q	PARKING LOT
R	AIRFF TRAINING FACILITY
S	FLIGHT KITCHEN FACILITY
T	RADIO TRANSMITTER RECEIVER BUILDING AND AIRPORT SURVEILLANCE RADAR
U	BULK JET FUEL STORAGE FACILITY
V	ADDITIONAL PARKING LOT
W	KANAMA BEACH PARK IMPROVEMENTS
X	REALIGN 5-23 TAXIWAYS
Y	NEW EAST RAMP ACCESS ROAD
Z	RELOCATED VORTAC SITE
AA	NEW AIRCRAFT RESCUE AND FIREFIGHTING FACILITY
BB	NEW CARGO ACCESS ROAD
CC	RELOCATED COMMUTER TERMINAL
DD	POTENTIAL PASSENGER TERMINAL EXPANSION
EE	ALAHAO STREET/OLD STABLE ROAD EMERGENCY ACCESS
FF	KEOLANI PLACE LEASE LOTS
GG	FUEL LINE TO RAMP
HH	AIRLINE GROUND EQUIPMENT



BELT COLLINS & ASSOCIATES  
ARIES CONSULTANTS LTD.

DATE: 07-13-92

Figure No  
**3.4.1**

DWC NO.:

3.4.1.2 Repave and Strengthen Existing Runway 2-20. The existing 7,000-foot runway is showing signs of pavement distress. An 8-inch thick asphaltic concrete overlay will be laid down over the runway after appropriate preparation, including the removal of deteriorated pavement. The overlay would stop the pavement breakup that has started to become a hazard for existing operations and increase the bearing strength of the runway to better accommodate the widebody aircraft using the Airport.

3.4.1.3 Construct New Airport Access Road. A new Airport Access Road will be constructed. The access road includes an overpass across Hana Highway, reducing the congestion that Airport traffic now contributes to on Dairy Road. The new access road will tie in with the existing terminal loop road. DOT has already initiated efforts to acquire the land needed for the access road.

3.4.1.4 Construct Additional Cargo Building. Additional cargo facilities will be developed in the area between Aalele Street and Haleakala Highway. Road access will be from the Kahului side via Haleakala Highway (which would cease being a through-route when Runway 2-20 is extended). Access to the passenger terminal ramp would be via the same road used to connect the Post Office to the ramp.

3.4.1.5 Construct Post Office Ramp Access Road. A new road will be constructed between Keolani Place (the existing Airport Access Road) and the ramp fronting the passenger terminal. The road, which will generally follow the present Aalele Street would provide vehicles from the U.S. Postal Service site and the additional cargo area proposed for this time period (see above) with direct access to the aircraft operating area.



3.4.1.6 Relocate VORTAC. Electromagnetic reflections off of the new passenger terminal have been found to interfere with operation of the existing VORTAC navigational system. DOT plans to relocate the VORTAC to an open area between the northern ends of Runways 2-20 and 5-23. This location is well removed from on- and off-site structures and is readily serviceable from the planned airfield perimeter road. The relocation is the responsibility of the FAA.

3.4.2 PHASE 2 (1997 to 2002)

3.4.2.1 Acquire Land Along Hana Highway for Parallel Runway. Additional land between the existing Airport Boundary and Hana Highway should be acquired to allow future development of a parallel runway. The land acquisition should allow for the straightening of Hana Highway and include the runway protection zone for a parallel runway at least 8,500 feet long.

3.4.2.2 Provide Site For Bulk Fuel Storage Facility. The recommended plan calls for the State to provide a 2 to 3 acre site adjacent to the southern portion of Keolani Place for a bulk fuel storage facility. The site would be leased to a private consortium that would construct and operate the storage facilities. It is removed from the approach and departure paths of the runways, minimizing the possibility of harm due to an aircraft accident. It is also outside existing flood areas. The storage tanks would be surrounded by berms that would contain fuel from any leak that might develop, and the site is separated from Kanaha Pond by a concrete drainage ditch that would impede the underground movement of spilled fuel towards Kanaha Pond. Surface runoff from the site would be away from Kanaha Pond, and site drainage facilities would include oil-water separators to minimize the possibility of spilled fuel reaching surface water drainageways. Initially, fuel would be transported to the facility by trucks operating between it and the fuel storage facilities at Kahului Harbor.

3.4.2.3 Construct Underground Pipeline Between Bulk Fuel Storage Facility and Ramp. The recommended Airport Master Plan calls for an underground pipeline that would carry fuel from the bulk fuel storage facilities to the passenger terminal ramp. This line would connect to an existing pipeline under the ramp. Underground hydrants would be attached to this pipeline so that aircraft could be served directly without the need for fueling trucks to operate in the vicinity of the aircraft.

3.4.2.4 Construct Additional Cargo Building. The Airport Master Plan calls for an additional cargo building to be located adjacent to the new cargo building provided in Phase 1 near the U. S. Postal Service site. The exact size, configuration, and timing of the building would depend upon the needs of the air cargo users at that time.

3.4.2.5 Construct Additional General Aviation T-Hangars. The recommended Airport Master Plan calls for the construction of new T-Hangars adjacent to the existing T-Hangars on the East Ramp. These, together with space in the proposed commercial aviation lease lots just to the north, would accommodate the aircraft storage needs of Maui's general aviation community.

3.4.2.6 Construct Commercial Aviation Lease Lots. The recommended Airport Master Plan calls for the construction of commercial aviation lease lots at the northern end of the East Ramp. One- and two-acre lots are proposed, each with direct apron access. These would be improved lots, with the lessees taking responsibility for the construction of necessary structures.

3.4.2.7 Construct Transient Aircraft Parking Apron. The proposed transient aircraft parking apron would be located on the northern side of Runway 5-23, west of its intersection with Runway 2-20. It would provide a place to park large transient aircraft during prolonged stay-overs at the Airport. It could also be used by military aircraft (including helicopters) transiting the Airport. This would eliminate the problems that result from the large military helicopters operating in the vicinity of the small, light civilian helicopters at the southern end of the East Ramp.

3.4.2.8 Construct New Scenic Air Tour Terminal Facilities Adjacent to East Ramp. The recommended Airport Master Plan calls for the dilapidated scenic air tour terminal facilities located on the East Ramp to be replaced with a new structure. It would contain restrooms, a lounge, and other facilities needed to accommodate passengers and crews of scenic air tour aircrafts.

3.4.2.9 Expanded Ground Transportation Subdivision. The recommended Airport Master Plan calls for the construction of additional industrial lots along the western side of Keolani Place southwest of Kalialinui Gulch. These 1- and 2-acre parcels would provide additional space for ground transportation operators (e.g., rental car agencies) and other airport-related industrial uses.

3.4.2.10 Provide Improved Site for Flight Kitchen. Increasing numbers of overseas flights will make it more desirable to provide an improved site for an on-Airport flight kitchen. The flight kitchen itself would be constructed and operated by a private entity. The site is located in the expanded subdivision on the west side of Keolani Place. Access to the passenger terminal apron would be through the existing access roads or through the proposed new Post Office/Air Cargo ramp access road.

3.4.2.11 Construct Kanaha Beach Park Improvements. The recommended Airport Master Plan calls for the expansion of Kanaha Beach Park. The expansion would be funded by the DOT, with operations the responsibility of the Maui County Department of Parks and Recreation.

**3.4.2.12 Provide Emergency Roadway Connection Between Alahao Street and Old Stable Road.** The recommended Airport Master Plan provides for the construction of a roadway linking Alahao Street with Old Stable Road. Normally, the road would be closed to vehicular traffic by a gate, but it would be opened in the event of an emergency (such as a tsunami) or closure of Hana Highway due to natural or other disasters. The roadway would be open for bicycle and pedestrian traffic at all times, thereby facilitating the County's development of a shoreline recreational trail.

**3.4.3 PHASE 3 (2003 to 2010)**

**3.4.3.1 Construct Parallel Runway 2R-20L.** Construct an 8,500 foot by 150 foot parallel runway (2R-20L) and associated taxiways located 2,500 feet to the east of existing Runway 2L-20R, and install runway and taxiway lights and other navigational aids.

**3.4.3.2 Relocate Taxiway Parallel to Runway 5-23.** This would move the taxiway centerline at the southwest end closer to the runway centerline thereby creating additional apron space in front of a future cargo building. It would also eliminate the line-of-sight interference that will exist between the FAA Air Traffic Control Tower and the west end of the taxiway to the end of Runway 5.

**3.4.3.3 Relocate Commuter/Air Taxi Operations to Main Passenger Terminal.** Changes in operating patterns have left the existing commuter terminal very underutilized. The recommended Airport Master Plan calls for relocating commuter operations to the main passenger terminal. This will call for some adjustments in security measures in order to accommodate the small number of aircraft that arrive from and depart to unsecured airports, but it will free up additional space in the existing commuter area for cargo facilities.

3.4.3.4 Construct Additional Air Cargo Facilities. The Airport Master Plan calls for a new cargo building to be located in the vicinity of the existing commuter/air taxi apron north of the passenger terminal. This would supplement the space available in the existing cargo building in this area and complement the air cargo complex being provided south of the main passenger terminal parking lot. Construction of this building will probably require closing the existing commuter/air taxi terminal and relocating its activities to the main passenger terminal.

3.4.3.5 Relocate Helicopter Activities to New Off-Site Heliport. The recommended plan calls for most helicopter facilities at the Airport to be relocated to a new off-site heliport before a parallel runway is constructed. This would eliminate the air traffic control conflicts that would exist if rotary-wing aircraft operate between two active fixed-wing runways, allowing the Airport to gain the full benefit of parallel runways.

3.4.3.6 Construct Additional Commercial Aviation Lease Lots at South End of East Ramp. Once helicopter activities are relocated off-site, the area they currently use will become available for other activities. The recommended Airport Master Plan calls for the area to be for Airport-related uses and support activities. These could include air cargo operators, such as UPS, who use their own aircraft and do not, therefore, need to be close to the passenger terminal apron. It could also be used as additional space for commercial aviation and fixed base operators.

3.4.3.7 Construct Cargo Facilities Access Road from Alahao Street. The recommended Airport Master Plan calls for a new road to be constructed from Alahao Street to the new and existing air cargo facilities near the existing commuter terminal. This would allow trucks to reach these facilities without passing in front of the passenger terminal.

3.4.3.8 Expanded Public Parking Lot and Realign Terminal Loop Road. The recommended Airport Master Plan provides space for the expansion of the main parking area fronting the air carrier passenger terminal. This would be done only as needed. The passenger terminal loop road would be realigned to enclose the enlarged parking area.

3.4.3.9 Additional Ground Transportation Subdivision Expansion. This entails the further expansion of the Ground Transportation Subdivision on the western side of Keolani Place. It would provide space needed to accommodate increased demand, as well as provide the Airport the flexibility to accommodate other Airport-related commercial and industrial activities in this area.

3.4.3.10 Construct New East Ramp Access Road Between Runways. Construction of a parallel runway will cut off the existing access to the facilities located on the East Ramp. Before that is done, a new spine road will have to be constructed between the runways. It would intersect Hana Highway at the new Pulehu Road intersection.

3.4.3.11 Construct Pipeline Between Bulk Fuel Storage Facility and Harbor. If fuel use volumes warrant it, a pipeline could be built between Kahului Harbor and the Bulk Fuel Storage Tanks described above. The exact routing of these, as well as the specific design specifications, are not known at the present time. Hence they will be the subject of separate environmental processing if and when a decision is made to proceed with them.

### 3.4.4 LAND ACQUISITION REQUIREMENTS

The amount of land that would need to be acquired is related to the implementation of three major projects: the Airport Access Road, the extension of existing Runway 2L-20R to 9,600 feet, and the construction of a new parallel Runway 2R-20L of 8,500 feet. Table 3.4.1 lists the preliminary land acquisition requirements for the three major projects. The Agricultural lands are owned by Alexander and Baldwin, Inc., and the residential lands are located in East Spreckelsville.

Table 3.4.1.  
Preliminary Land Acquisition Requirements

	<u>Estimated No. Of Acres</u>		<u>Total</u>
	<u>Agricultural</u>	<u>Residential</u>	
Airport Access Road	116	-	116 *
Existing Runway 2L-20R extended to: 9,600 feet	60	-	60 *
New Parallel Runway 2R-20L: 8,500 feet	<u>510</u>	<u>5</u>	<u>515</u>
Total	686	5	691

\* Recommended Action within the next five years (176 acres).

Source: R. T. Tanaka Engineers, Inc.  
Pacific Planning & Engineering, Inc.

### 3.4.5 ESTIMATED PROJECT COSTS

The total preliminary project cost estimate to implement the Proposed Action is \$308,200,000 as listed in Table 3.4.2. The total preliminary project cost estimate for the actions recommended in the next five years is \$96,800,000. These are order-of-magnitude or "ball park" cost estimates of the improvements.

Table 3.4.2.  
Preliminary Project Cost Estimates  
(1991 Dollars)

<b>Land acquisition</b>	
Existing Runway 2L-20R (9,600 feet) (1)	\$300,000
Parallel Runway 2R-20L (1)	7,500,000
Airport Access Road	3,400,000
<b>Airfield improvements including extending runway, taxiways, and navigational aids</b>	
Existing Runway 2L-20R (9,600 feet)	33,200,000
Parallel Runway 2R-20L (8,500 feet)	111,800,000
<b>Cargo</b>	14,500,000
<b>Commercial aviation/Fixed based operators</b>	2,900,000
<b>Transient parking apron</b>	18,500,000
<b>General aviation</b>	2,300,000
<b>Scenic air tour</b>	1,300,000
<b>Ground transportation</b>	1,000,000
<b>Commercial development area</b>	1,300,000
<b>Roads and utilities</b>	
Airport access road	51,500,000
Circulation roadways	16,100,000
Utilities and drainage	37,200,000
<b>Airport support</b>	
Flight kitchen	700,000
Bulk jet fuel storage	800,000
<b>Kanaha Beach Park</b>	<u>3,900,000</u>
<b>Total</b>	<b>\$308,200,000</b>

Note 1: Based upon tax assessed values.

Source: Pacific Planning & Engineering, Inc.  
Project Managers Hawaii, Inc.



## 4.0 ALTERNATIVES STUDIED

This Section describes the No-Action and Proposed Action alternatives studied in the Final EIS.

### 4.1 NO-ACTION ALTERNATIVE

This alternative evaluates the impacts if the recommended projects described in Section 3.4 are not implemented. The existing Runway 2-20, Keolani Place road, and various facilities for passenger terminal, air cargo, general aviation, scenic air tour, ground transportation, and fueling would remain unchanged.

The number of aircraft operations forecast for 2010 will exceed the existing Airport's runway capacity of approximately 200,000 fixed wing aircraft operations per year. The likely response to this limitation by the industry would be a sharp decrease in general aviation local operations, and increases in average air carrier aircraft size and load factors. Such an expected response would continue to allow the Airport to accommodate the forecast number of passengers, but would lead to congestion, delays and inconveniences.

While DOT believes the available evidence suggests that the absence of a longer runway will not result in substantially lower passenger volumes than were forecast in the SASP, some individuals believe this is not the case. Because of this, this EIS considers two "no-action activity level scenarios."

The first is referred to as the "Base No-Action Scenario." It uses the SASP passenger forecast, but reduces the aircraft activity levels to reflect the constraint that would be imposed on non-air carrier aircraft by the existing airfield capacity. The second no-action scenario assumes that failure to extend the runway to accommodate non-stop flights to the Mid-West would result in passenger levels 10 percent below those that would be experienced

with the proposed extension. The available evidence suggests that any reduction that might occur is extremely unlikely to exceed that level. Thus, it is considered appropriate for a sensitivity analysis.

#### 4.1.1 AVIATION DEMAND AND OPERATIONAL FORECASTS

##### Base No-Action Scenario

The aviation demand and operational forecasts for the Base No-Action Scenario are summarized in Table 4.1.1. For this scenario, the forecasts project Kahului Airport can accommodate 9,059,000 passengers, 200,200 fixed wing operations, and 63,300 helicopter operations by 2010. The 9,059,000 passengers include enplaned and deplaned passengers, and is equivalent to 4,529,500 visitor and resident trips. The assumptions used in preparing the forecasts for this scenario were as follows:

1. All air carrier and commuter/air taxi operations and cargo operations can be accommodated.
2. 50 percent of General Aviation (GA) local operations would discontinue due to the high level of air traffic activity. This decrease in 22,200 GA local (training) operations is expected to occur because of higher jet activity and the reduced time available for "touch-and-go" training. Maui GA operators have confirmed that they would not fly local operations if high levels of air traffic activity are experienced.
3. More B-737 and DC-9 aircraft, and less BAe 146 and DHC-7 interisland aircraft would be used.
4. No international passengers and operations would occur.
5. All GA itinerant (non-training) and military operations can be accommodated.
6. Helicopter operations continue to operate basically independent of fixed-wing operations. However, some rerouting of helicopter flights to and from West Maui may be required.

**Table 4.1.1 Aviation Demand Forecasts  
Kahului Airport**

		No Action Alternative		Proposed Action
		Base Scenario	Constrained Scenario	
<b>ANNUAL FORECASTS</b>				
<b>Passengers</b>				
Overseas:	Mainland	2,377,000	1,833,000	237,000
	International			
	Interisland	6,682,000	6,320,000	6,682,000
	<b>TOTAL</b>	<b>9,059,000</b>	<b>8,153,000</b>	<b>9,059,000</b>
<b>Aircraft Operations</b>				
	Air Carrier	88,100	80,400	104,000
	Commuter/Air Taxi	52,300	47,100	56,700
	General Aviation	51,800	49,200	74,000
	Military	8,000	8,000	8,000
	<b>Fixed Wing Subtotal</b>	<b>200,200</b>	<b>184,700</b>	<b>242,700</b>
	<b>Helicopters</b>	<b>63,300</b>	<b>57,000</b>	<b>63,300</b>
	<b>TOTAL</b>	<b>263,500</b>	<b>241,700</b>	<b>306,000</b>

Source: Aries Consultants, Ltd.

### Constrained No-Action Scenario

Under the Constrained No-Action Scenario, the forecasts for Kahului Airport were reduced by 10 percent to 8,153,000 passengers, 184,700 fixed wing operations, and 57,000 helicopter operations by 2010. The 8,153,000 passengers include enplaned and deplaned passengers, and are equivalent to 4,076,500 visitor and resident trips. The assumptions used in preparing the forecasts for this scenario were as follows:

1. Overseas and interisland air carrier operations would be reduced in proportion to the lower passenger volumes.
2. Commuter/air taxi operations (fixed wing and helicopter) and itinerant general aviation operations would be 90 percent of the Base No-Action Activity Level to reflect the lower passenger volumes.
3. All air carrier and commuter/air taxi operations and cargo operations can be accommodated.
4. 55 percent of General Aviation (GA) local operations would discontinue due to the high level of air traffic activity. This decrease in 24,800 GA local (training) operations is expected to occur because of higher jet activity and the reduced time available for "touch-and-go" training. Maui GA operators have confirmed that they would not fly local operations if high levels of air traffic activity are experienced.
5. More B-737 and DC-9 aircraft, and less BAe 146 and DHC-7 interisland aircraft would be used.
6. No international passengers and operations would occur.
7. All military operations can be accommodated.
8. Helicopter operations continue to operate basically independent of fixed-wing operations. However, some rerouting of helicopter flights to and from West Maui may be required.

## 4.2 PROPOSED ACTION

The Proposed Action evaluates the impacts if the recommended improvements described in Section 3.4 were implemented. International Arrivals Facilities would not be constructed within the planning horizon of the Master Plan Update Study (2010). A supplemental or new EIS will be prepared if the State and County governments decide to provide Facilities (temporary or permanent) to accommodate regularly scheduled non-stop flights from foreign countries to Maui. Background information on international arrivals is presented in Appendix J for informational and disclosure purposes.

Puunene Sugar mill stack number 1 currently penetrates the 50:1 approach surface slope by 6 feet, and is classified as an "obstruction" under Federal Aviation Regulations (FAR) Part 77. If Runway 2L-20R was extended to 9,600 feet, Puunene mill stack numbers 1, 4, and 5 would penetrate the 50:1 approach slope by 26 to 45 feet. If the FAA determines the mill stacks are not "hazards" and are properly lighted, no action would be required. If the FAA determines the stacks are "hazards," then Puunene mill stack number 1 (which is not presently used) will need to be shortened by 18 feet or a displaced threshold must be provided for aircraft landing on an extended Runway 2L. FAA determined that a 400 foot displaced threshold would be required for the extended runway.

The major potential problem of shortening the stacks is the pollution and the dispersion and distribution of combustion waste material (solids and noxious gases) from the the stacks. Since stack number 1 is not in use, it could be shortened or removed without any air quality impacts. An "Air Quality Modeling Study," conducted by Sierra Research for the Runway Study concluded that "the proposed modification of the stacks that penetrate the 50:1 approach surface will not cause any new violations of State and Federal Ambient Air Quality Standards." The State Department of Health may require carbon monoxide monitoring as a condition of approval for an air quality permit.

#### 4.2.1 AVIATION DEMAND AND OPERATIONAL FORECASTS

The aviation demand and operational forecasts for the Proposed Action are summarized in Table 4.1.1. The forecasts project Kahului Airport will accommodate 9,059,000 passengers, 242,700 fixed wing operations, and 63,300 helicopter operations by 2010. The 9,059,000 passengers include enplaned and deplaned passengers, and are equivalent to 4,529,500 visitor and resident trips. The assumptions used in preparing the forecasts were as follows:

1. All air carrier and commuter/air taxi operations and cargo operations can be accommodated.
2. All general aviation itinerant and local operations, and all military operations can be accommodated.
3. No international passengers and operations would occur.
4. It would be difficult to continue helicopter operations at their present location because they would be situated between two active runways. To study the "worst case" capacity scenario, however, the helicopter operations were assumed to continue even if helicopters may need to be rerouted to and from the Airport.

## **5.0 IMPACTS ON THE PHYSICAL ENVIRONMENT**

Beginning with this Section through Section 9.0, the potential impacts to the environment, social-economic conditions, infrastructure and public facilities are described. Where appropriate, potential mitigation measures to minimize potential adverse impacts are also presented.

### **5.1 GEOLOGY, SOILS AND AGRICULTURAL POTENTIAL**

#### **5.1.1 EXISTING CONDITIONS**

##### **5.1.1.1 Physiography**

The existing Airport boundary encompasses approximately 1,447 acres. The Airport property slopes gradually downward from south to north with Hana Highway having an approximate elevation of 70 feet and the north side of the Airport having an approximate elevation of 10 feet. Over the length of the entire property (a 12,900-foot linear distance), the elevation decreases 60 feet resulting in an average slope of 0.5 percent. The Airport reference elevation (which is located at the intersection of Taxiways "A" and "F") is 53 feet above mean sea level.

##### **5.1.1.2 Soils and Agricultural Potential**

The soils of Central Maui, including Wailuku, Kahului, Puunene, Waikapu, Paia, and Kihei, are generally deep, well-drained, nonstony, and well adapted for the cultivation of irrigated sugar cane and pineapples. The dominant Great Soil Groups are the Low Humic Latosol, Alluvial, Reddish Brown and Regosol. The project area consists of seven soil types as classified by the United States Department of Agriculture, Soil Conservation Service (August, 1972). The seven soils types are described below and shown on Figure 5.1.1.

DL Dune Land. Dune land consists of hills and ridges of sand-size particles drifted and piled by wind. The hills and ridges are actively shifting or are so recently fixed or stabilized that no soil horizons have developed. The sand is dominantly from coral and seashells. Elevations range from nearly sea level to 150 feet. The annual rainfall amounts to 15 to 90 inches. This land type is used for wildlife habitat, recreational areas and as a source of liming material.

EaA Ewa Silty Clay Loam. 0 to 3 percent slopes. This series consists of well-drained soils in basins and on alluvial fans on the island of Maui. Elevations range from near sea level to 150 feet. The annual rainfall amounts to 10 to 30 inches. On this soil, runoff is very slow and the erosion hazard is no more than slight. This soil is used for sugarcane and homesites.

JcC Jaucas Sand. Saline. 0 to 12 percent. This series consists of excessively drained, calcareous soils that occur as narrow strips on coastal plains, adjacent to the ocean. They are nearly level to strongly sloping with elevations from sea level to 100 feet. The annual rainfall amounts to 10 to 40 inches. This soil occurs near the ocean in areas where the water table is near the surface, and salts have accumulated. The water table is normally within a depth of 30 inches. This soil is used for pasture, wildlife habitat, and urban development.

MuA Molokai Silty Clay Loam. 0 to 3 percent slopes. This series consists of well-drained soils ranging from nearly sea level to 1,000 feet. The annual rainfall amounts to 20 to 25 inches. This soil is on smooth slopes and used entirely for sugar cane on Maui. In a representative profile the surface layer is dark reddish-brown silty clay loam about 15 inches thick. The soil is slightly acid to neutral, except that areas used for pineapple are commonly very strongly acid. Permeability is moderate, runoff is slow, and the erosion hazard is slight.



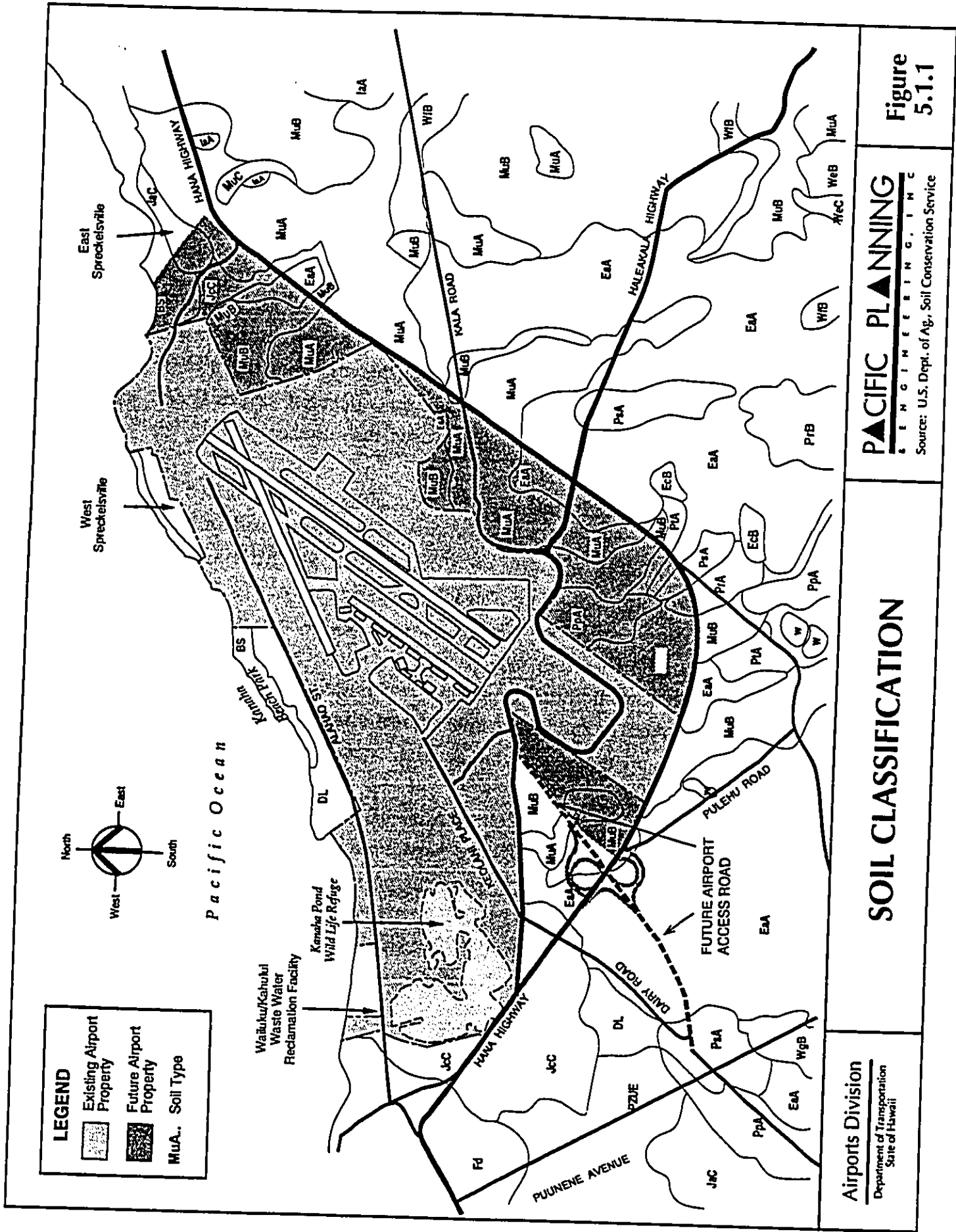


Figure 5.1.1

**PACIFIC PLANNING**  
ENGINEERING INC.  
Source: U.S. Dept. of Ag., Soil Conservation Service

**SOIL CLASSIFICATION**

Airports Division  
Department of Transportation  
State of Hawaii

MuB Molokai Silty Clay Loam. 3 to 7 percent slopes. This series consists of well-drained soils ranging from nearly sea level to 1,000 feet. The annual rainfall amounts to 20 to 25 inches. On this soil, runoff is slow to medium and the erosion hazard is slight to moderate. This soil is used for sugarcane, pineapple, pasture, wildlife habitat, and homesites.

PpA Pulehu Silt Loam. 0 to 3 percent slopes. This series consists of well-drained soils on alluvial fans and stream terraces and in basins. The soils are nearly level to moderately sloping with elevations ranging from nearly sea level to 300 feet. The annual rainfall amounts to 10 to 35 inches. This soil is similar to Pulehu clay loam, 0 to 3 percent slopes (PsA), except that the texture is silt loam. This soil is used for sugarcane.

PsA Pulehu Clay Loam. 0 to 3 percent slopes. This series consists of well-drained soils on alluvial fans and stream terraces and in basins. The soils are nearly level to moderately sloping with elevations ranging from nearly sea level to 300 feet. The annual rainfall amounts to 10 to 35 inches. In a representative profile the surface layer is dark-brown clay loam about 21 inches thick. The soil is neutral in the surface layer and neutral to mildly alkaline below the surface layer. Permeability is moderate, runoff is slow and the erosion hazard is no more than slight. Low areas are subject to flooding. This soil is used for sugarcane, truck crops, and pasture.

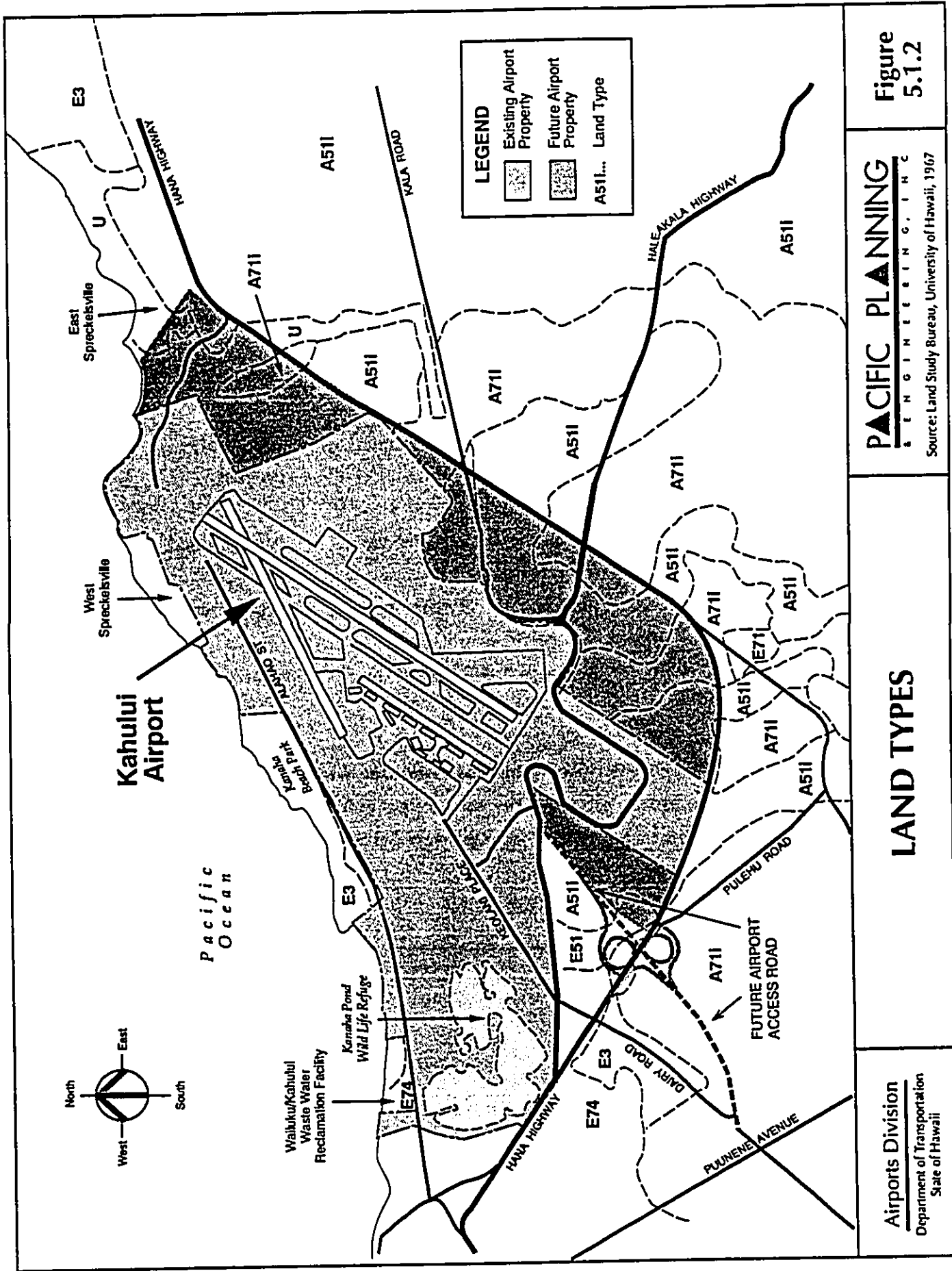
The Land Study Bureau of the University of Hawaii published a report on the inventory and evaluation of land resources of the island of Maui. This report entitled Detailed Land Classification - Island of Maui, dated May, 1967 classified the overall productivity ratings of lands within the project area. The land types, productivity ratings and descriptions of the project area are summarized in Table 5.1.1 and shown on Figure 5.1.2.

**Table 5.1.1.**  
**Land Types: Productivity Ratings and Descriptions**

<b>Rating/ Type</b>	<b>Sugar Cane (1)</b>	<b>Soil Series</b>	<b>Stoniness</b>	<b>Drainage</b>	<b>Machine Tillability</b>
A51i	a	Molokai	Nonstony	Well-drained	Well-suited
A71i	a	Pulehu	Nonstony	Well-drained	Well-suited
E3	e	Catano	Nonstony	Excessively- drained	Well-suited
E51	e	Molokai	Nonstony	Well-drained	Well-suited
E71	e	Pulehu	Nonstony	Well-drained	Well-suited
E74	e	Kealia	Nonstony	Poorly drained	Poorly suited

**Note 1** Selected crop productivity ratings for sugar cane were as follows:  
**Class a:** 0.53 tons or more sugar per acre per month  
**Class e:** Less than 0.22 tons sugar per acre per month

**Source:** Land Study Bureau, University of Hawaii



U.S. GOVERNMENT PRINTING OFFICE: 1967 O 300 000

## 5.1.2 PROBABLE IMPACTS

### No Action Alternative

Alexander and Baldwin, Inc. (A & B) owns all agricultural lands immediately surrounding Kahului Airport. Hawaiian Commercial & Sugar Company (HC&S), a division of A & B, is a 36,000 acre sugar plantation which has cultivated sugar cane on Maui for over 100 years.

Under this alternative, the existing physiography of the Airport would not change, no agricultural lands would be acquired, and HC&S agricultural activities in the area would not be affected by the Airport. However, A & B has long-term plans to convert approximately 340 acres of its land near the Airport from Agriculture (sugar) to industrial and other Urban uses. The State Land Use Commission recently approved part of their request and amended the land use district boundaries and reclassified approximately 76 acres from Agricultural to Urban District, and approved the incremental redistricting of a second phase of approximately 53 acres. As a part of their rezoning request, A & B clearly indicated the 340 acres were not needed for the long-term well-being of its sugar operations.

### Proposed Action

Recommended airport improvements with the potential to affect agricultural lands are the Airport Access Road, extension to existing Runway 2-20, improvements to the area adjacent to the East Ramp, and a parallel runway.

According to A & B, the withdrawal of 691 acres from cultivation is significant to HC&S. Their plans to withdraw 340 acres from the plantation would also have a significant impact on HC&S but they would be able to properly compensate HC&S for the conversion. A & B believes HC&S should be compensated for: the loss of revenue from the acres removed from cultivation, the capital improvements and operating costs to accommodate the displaced mill water currently used to irrigate the withdrawn acreage, and road and irrigation improvements necessary to continue to farm the remaining fields in the area.

DOT is currently negotiating with A & B on the lands to be acquired and is expected to lease back any property it acquires until the land is needed for actual construction. The lease back arrangements would enable A & B time to undertake an orderly transition from its current sugar operations and to permit HC&S to use the land productively until construction starts.

Soils in the areas which would be acquired are mostly classified as having the highest over-all (A) and selected crop productivity (a) ratings. They are also classified as prime agricultural land under the State's ALISH system (Agricultural Lands of Importance to the State of Hawaii). Prime agricultural land is defined as land which has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods. According to the State Department of Agriculture, the withdrawal of the agricultural lands would be permanent and irreversible, and over time, would have a negative cumulative effect upon agricultural resources.

Grading would be required for the extension of Runway 2-20 and the parallel runway, and filling for the expansion of the ground transportation subdivision along Keolani Place and air cargo facilities. Only the construction of the parallel runway is expected to significantly alter drainage at the Airport.

## 5.2 GROUND, SURFACE WATER AND DRAINAGE

This Section discusses the potential impacts on ground and surface water and drainage in the vicinity of the Airport. AECOS, Inc. reports on their water quality assessment is summarized below and included in its entirety as Appendix B.

### 5.2.1 EXISTING CONDITIONS

#### 5.2.1.1 Nearshore Environment

The marine environment off the Kahului Airport is a reef flat of considerable areal extent referred to as "Spartan Reef". The outer edge of this reef is over one-half mile from shore. At a distance of over one mile from shore, the submerged reef platform reaches a depth of only 30 feet. Offshore, the low-relief limestone bottom is cut by surge channels, the bottoms of which are thinly covered by sand (AECOS, 1979). This reef extends from near Kahului Harbor eastward to Lower Paia, where the reef narrows substantially then disappears as a distinct feature. The reef flat itself is not of the classically shallow form, rising to shoal depths near the outer edge. Instead, the bottom drops away to about 10 feet depth a short distance offshore then gradually deepens seaward.

Coral is abundant on Spartan Reef far from shore. At depths of 15 to 30 feet, coral cover approaches 85% and is dominated by Porites lobata and Montipora flabellata. The distribution of algae is patchy--cover is generally less than 5%, although it reaches 15% off Papaula Point. Asparagopsis taxiformis is most conspicuous. Turbinaria ornata, Galaxaura sp., and Amansia glomerata are also present. The sea urchin, Tripneustes gratilla, is abundant. The soft coral, Palythoa tuberculosa, is common. Acanthurus nigrofuscus and Abudefduf abdominalis are the most common of a generally sparse fish fauna.

Spreckelsville Beach on the makai side of the Airport studied by Moberly and Chamberlain (1968; also Gerritsen, 1972). Moberly and Chamberlain noted (for the area off Kanaha Beach Park): "An alongshore current to the west prevails, causing thick masses of seaweed to be deposited on the beach during early summer. However, with southerly storms, an alongshore current is produced to the east." Presumably, the onshore wind and nutrient enriched groundwater are primarily responsible for the masses of seaweed deposited on the shore near Kanaha Beach Park. Moberly and Chamberlain also noted that Spreckelsville Beach "... appears to undergo erosion only during the early spring."

Spreckelsville Beach continues to experience erosion problems noted several decades ago (Stearns and MacDonald, 1942). Beach sand volume and width are significantly reduced from the early 1960's (Campbell, 1972). Numerous groins have been built along this coast, particularly in the vicinity of Kanaha Beach Park. These groins tend to accumulate sand on the east side and promote erosion on the west side, although the erosion is not great.

#### 5.2.1.2 Surface Runoff

Drainage from the east side of the Airport is directed into low areas behind the coastal dunes and percolates into the ground. No drainage outlets exist at the shoreline opposite the Airport east of Kalialinui Gulch. Lands west of the airport drain into Kanaha Pond; Kalialinui Gulch effectively isolates the airport surface drainage from it.

Flow in Kalialinui Gulch is intermittent, and during the summer dry season, very little, if any, water reaches the coast through it. Kalialinui Gulch is the only ocean outlet for storm water originating on the Airport and for extensive agricultural areas (primarily sugarcane) south and west of the airport. At the time of the water quality survey in 1990, the drainage system was undergoing construction to increase its flow capacity.



### 5.2.1.3 Existing Water Quality

A single series of water samples were collected on August 20, 1992 from along the coastline between Spreckelsville Beach and the Kahului wastewater treatment plant (WWTP). Sample locations are shown in Figure 5.2.1. These samples were analyzed for nutrients, turbidity, pH, and total petroleum hydrocarbons (TPH) to provide an indication of the existing water quality of the shoreline opposite the Kahului Airport. The results of these analyses are presented in Table 5.2.1; the values printed in bold type exceed the dry season (May to October) levels for these waters contained in the State Water Quality Standards. Because the values in the table are for "one-time" samples, whereas the standards are for annual averages, these exceedances do not necessarily represent violations. However, the comparison suggests that the quality of the coastal waters near the Kahului Airport is already influenced by landside activities.

The only visible human activity influencing the water quality at the time of sampling was the construction of the Kalialinui Gulch drainage channel. Work at the shoreline produced the high turbidity value at Station 5 (a plume was evident and the sample was collected in this plume). Despite the construction activity, water quality along the Spreckelsville coast was generally better at the west end (closest to Kahului Harbor) than at the east end of the area sampled.

The generally poorer water quality to the east seems to be related to nutrients from groundwater influx along this section of the coast as evidenced by the particularly high nitrate values. The low ammonia, low phosphate, and high chlorophyll *a* measured at Station 1 indicate a phytoplankton bloom occurring at the time of the sampling within the cove off this beach. The high density of phytoplankton may be contributing to the high turbidity value. Here, as elsewhere along this coast, wave action suspending fine material also contributes to the turbidity of the water close to shore.

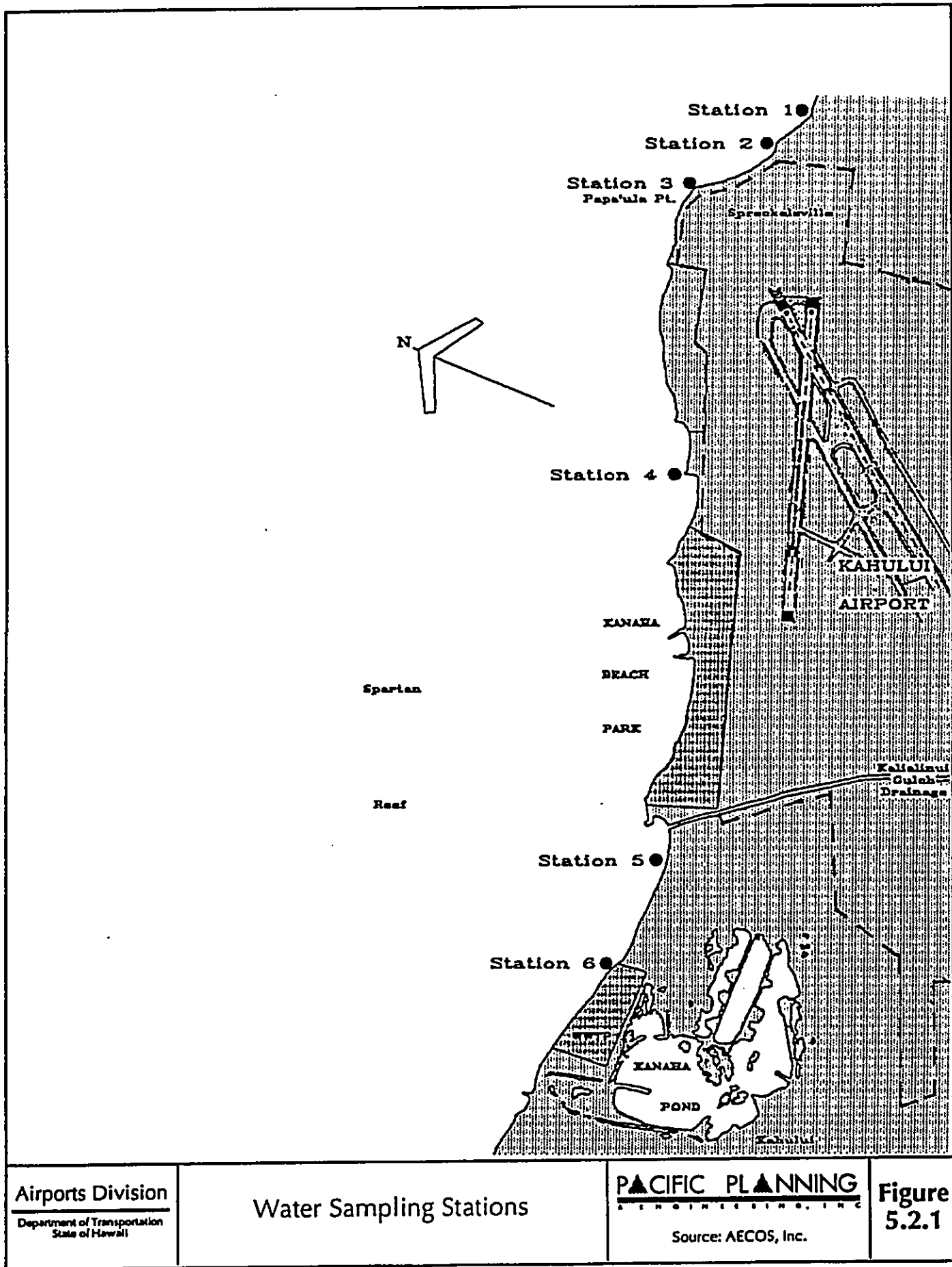


Table 5.2.1 Results of August 1990 Water Quality Analyses,  
Vicinity of Kahului Airport

	STATION					
	1	2	3	4	5	6
Total N (n/L)	0.48	0.69	0.49	0.30	0.16	0.20
Ammonia (mg N/L)	<0.005	0.015	0.018	0.012	0.008	0.015
Nitrate + Nitrite (mg/L)	0.323	0.537	0.358	0.183	<0.005	0.023
Orthophosphate (mg P/L)	<0.005	0.009	0.008	0.012	0.018	0.012
Chlorophyll <i>a</i> (ug/L)	18.1	1.41	0.82	0.32	0.44	0.61
pH	8.09	8.25	8.23	8.38	8.22	8.24
Turbidity (NTU)	3.50	1.20	1.20	0.93	2.38	1.84
TPH (Total Petroleum Hydrocarbons)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Note: Figures in bold type exceed the "dry season" (May to October) standard.

Source: AECOS, Inc.

The absence of detectable amounts of petroleum residue in nearshore waters indicates there is no chronic petroleum contamination from the Airport.

Samples of the coastal waters in this same area were collected previously in March, 1981 (AECOS, 1981) and the results of this earlier survey were reviewed for comparative purposes. The water quality in 1981 was very similar to the condition measured in 1990. Although less stringent, wet season criteria (DOH, 1989) apply to these March samples, the water quality standards appear to be exceeded to about the same degree as in 1990. The station locations in 1981 were not the same as those used in 1990. Combining the results for all stations and calculating mean values allows for a ready comparison of the two survey results (Table 5.2.2). From this comparison, only nitrate plus nitrite, pH, and turbidity show any substantial differences between 1981 and 1990. Generally, higher nitrate values (as measured in 1990) can be attributed to influences from the land, very probably from groundwater influx given that surface runoff (drainage systems and streams) was not present at the time of the sampling.

#### 5.2.2 PROBABLE IMPACTS

Drainage Pattern. The proposed development of new roadways, structures, and other impermeable surfaces on the western side of the Airport will slightly increase stormwater volumes in Kalialinui Gulch. The difference will be small relative to the total volume that is discharged, however, and sufficient channel capacity is available to accommodate it. Planned improvements to the East Ramp area would slightly increase runoff onto the lands east of Kanaha Beach Park; this would pond and then percolate into the ground.

**Table 5.2.2 Comparison of Geometric Means Calculated from all Stations  
Sampled March 1981 and August 1990**

<u>SURVEY</u>	<u>MARCH 1981</u>	<u>AUGUST 1990</u>
Salinity (%)	33.75	---
Total N (mg n/L)	0.30	0.34
Ammonia (mg N/L)	0.014	0.011
Nitrate + Nitrite (mg/L)	0.038	0.101
Orthophosphate (mg P/L)	0.009	0.010
Total Phosphate (mg P/L)	0.02	—
Chlorophyll <i>a</i> (ug/L)	—	1.10
pH	7.8	8.2
Turbidity	2.1	1.6

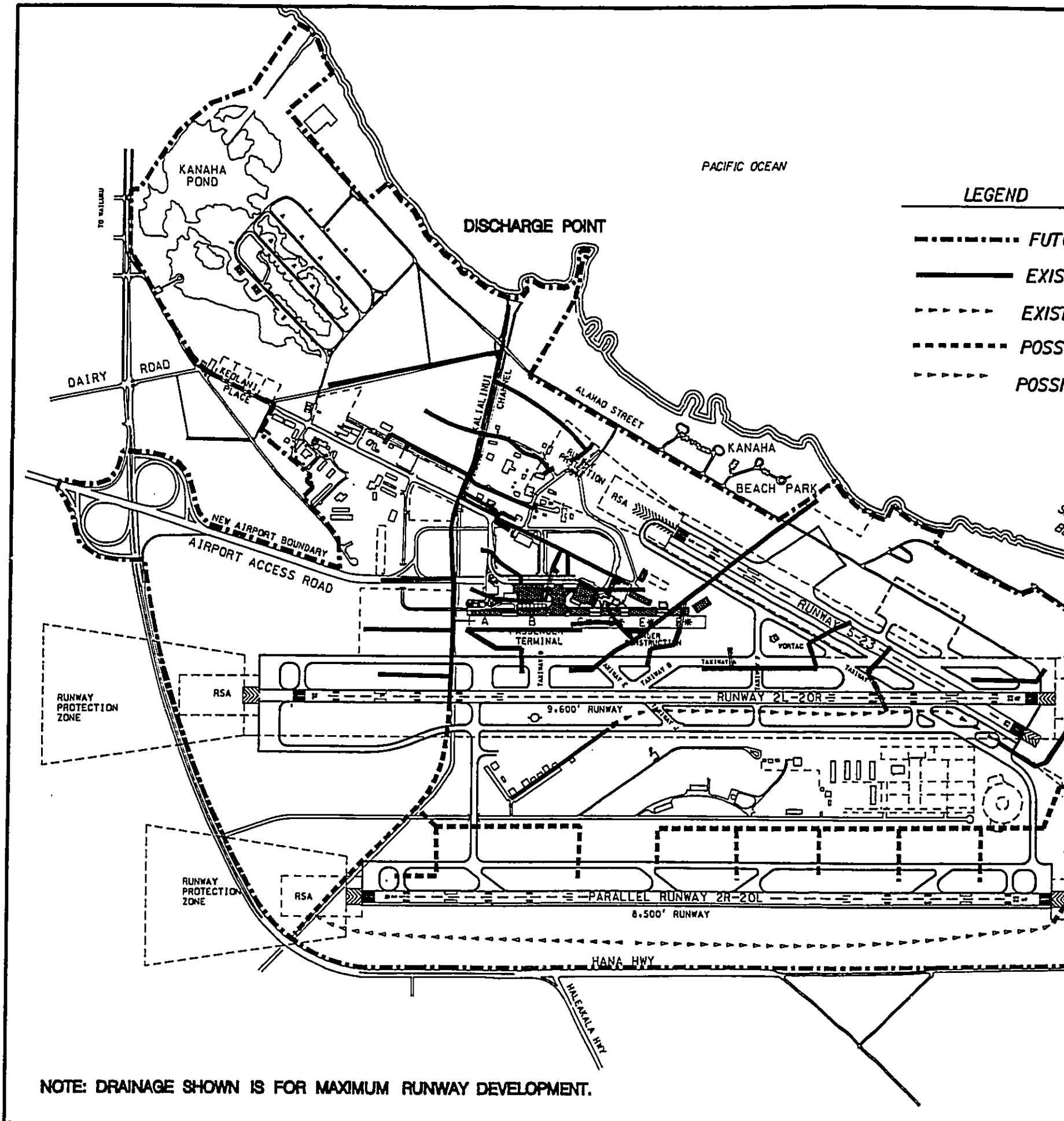
Source: AECOS Inc.

The proposed parallel runway to the southeast of the existing Runway 2-20 will require an additional drainage system with an outlet on the Spreckelsville shore. A tentative location for the discharge point is shown in Figure 5.2.2.

Nutrient Levels. The proposed airport facilities would not contribute significant amounts of nutrients to ground or surface waters. Hence, they would not contribute measurably to the high nutrient concentrations measured in nearshore waters. In fact, by displacing some agricultural activity whose presence probably contributes to the elevated nutrient levels, nearshore conditions may actually improve somewhat with respect to these water quality parameters.

It is possible that construction of a second drainage outlet to serve the parallel runway could degrade water quality slightly in the vicinity of the new outlet. However, the available evidence suggests that it might lead to marginal changes in nutrient concentrations, salinity, and suspended sediment. None of these changes appears likely to be significant, but this judgement must be confirmed when more detailed design information is available.

Toxic Contaminants. Toxic contaminants in runoff from urban and industrial lands can be taken up by marine organisms and become harmful to the marine biota as well as humans that utilize the contaminated fish and shellfish as food. Like any urban area with high vehicular use, and with the addition of aircraft fueling and maintenance operations, airports are at least potential sources of pollutants that could enter the marine food chain in low concentrations and bioaccumulate or biomagnify. Airports are not, however, exceptional in this regard. The nature of pollutant contributed to runoff will resemble those from other urban areas.



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**LEGEND**

- FUTURE AIRPORT BOUNDARY
- EXISTING DRAINAGE
- - - - - EXISTING OPEN UNLINED DITCH
- POSSIBLE FUTURE LINED DITCH OR CULVERT
- - - - - POSSIBLE FUTURE OPEN UNLINED DITCH

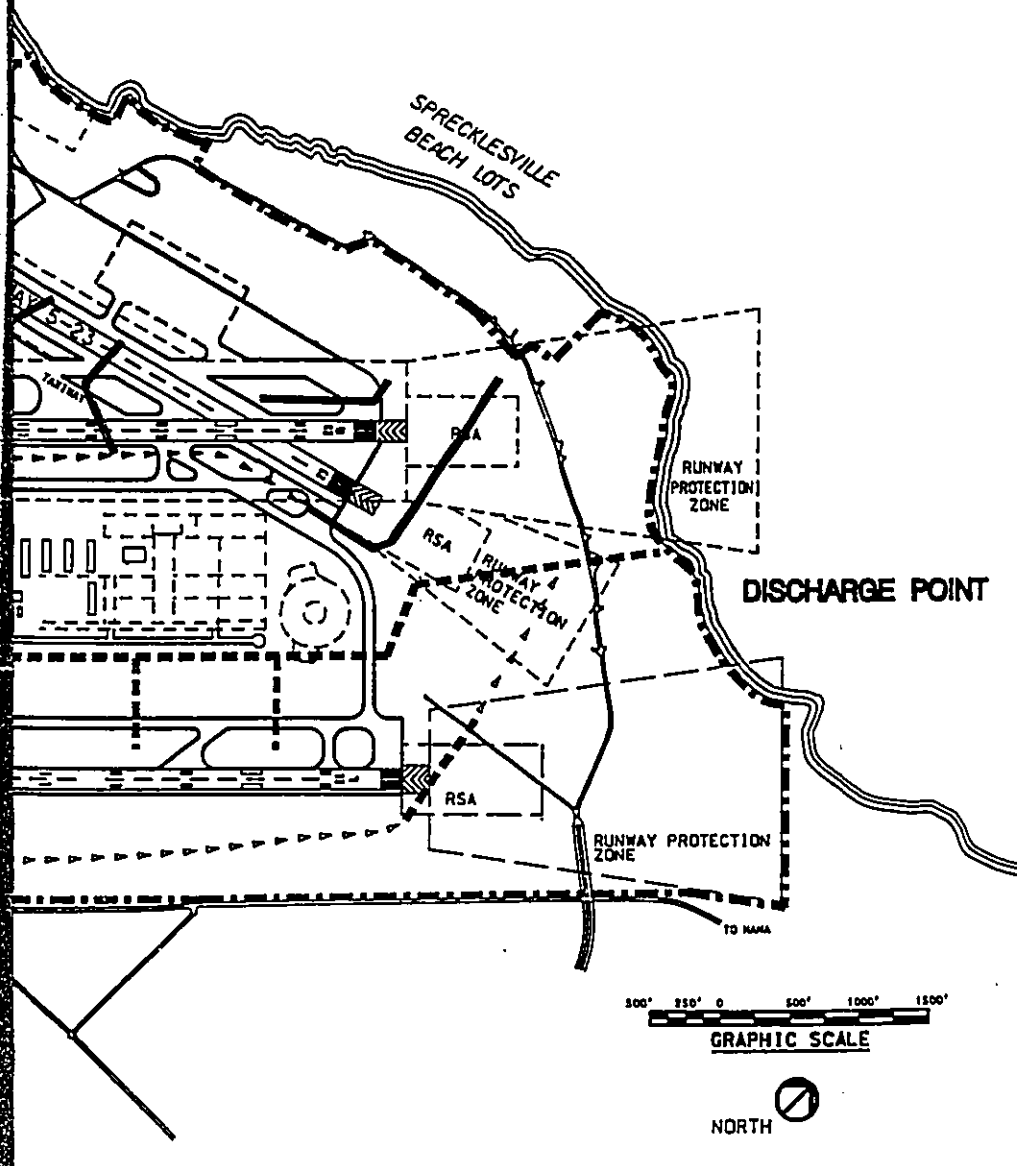


FIGURE 5.2.2

PROJECT TITLE:

KAHULUI  
AIRPORT  
E.I.S.

PROJECT NO.:

SHEET TITLE:

DRAINAGE SYSTEM

DATE:  
JULY 1992

SHEET NO.:

OF NO.:



Beach Stability. The shoreline in the vicinity of the new drainage outlet that is proposed consists of a gently sloping field of basalt boulders. The beach is narrow and of low slope here. Sand deposited around the boulders is continuous with the beach formation which extends both east and west along the shore beyond the boulder field. Preliminary plans do not include groins for the outlet structure.

The outflow of water from a stream or drainage structure can interrupt longshore or lateral sand movement by pushing the sand offshore, potentially beyond the reach of wave forces depositing the material on the shore. If the discharge is not a significant source of sedimentary material, and urban storm drains usually are not, erosion of the beach at the outlet can result. In such cases, interference with lateral sand drift is dependant upon the force of the outflow and its constancy, as well as the interplay of these factors with the natural depositional processes. In the absence of an outflow or when the flow volume is low (dry season conditions), normal sand deposition will block the drainage mouth.

Water Quality Effects of Airport Operations. Construction of the parallel runway would increase the capacity of the airfield, allowing more general aviation activity, and the provision of a longer runway might contribute to somewhat higher passenger volumes than would be the case if the Airport is limited to the existing facilities. To the extent that these increase the handling and use of petroleum products on the Airport, this will theoretically increase the potential for hydrocarbon contamination of surface or groundwater. In reality, the fact that total petroleum hydrocarbon concentrations are currently below detectable levels in nearshore waters despite the presence of extensive existing handling of these products suggests that the change in water quality that can be anticipated as a result of the Proposed Action is extremely small.

In addition, to prevent fuel spills from draining into Kalialinui Gulch, Kahului Airport employs a storm drainage system that is strategically located to cover the entire passenger terminal apron area. The drainage system is comprised of a two-level catchment system which has a valve connection to the first level allowing fuel runoff to be directed to storage tanks located under the ramp area. As storm water flows from the apron area into the drainage system, the first level of the catchment system is filled up. As the first level fills up and reaches capacity, the water overflows into the airport's main drainage system which carries the water under the runway to either Kalialinui Gulch or the drainage area located at the end of Runway 23. In the event of a fuel spill or leakage, the Aircraft Rescue and Fire Fighting (ARFF) team is called. The valve for the fuel catchment system is opened which allows fuel trapped in the first level to flow into the storage tanks under the apron area. The fuel can then be pumped out of the storage tanks and properly disposed of.

The additional storm drainage outlet that is called for in the proposed plan has the potential to direct runoff from several hundred acres into nearshore waters that now receive runoff from a much smaller area. As indicated above, this runoff is expected to contain only small amounts of chemical pollutants; however, it would measurably increase the volume of sediment reaching the shoreline in the vicinity of the proposed outlet. Additional controls over storm water runoff are currently being developed and implemented by the State Department of Health in response to regulations promulgated by the Environmental Protection Agency under the National Pollutant Discharge Elimination System (NPDES) program (55 FR 47990 et seq.; 56 FR 12098 et seq.). The new storm drainage outlet would require an NPDES permit, and it is anticipated that compliance with the provisions of the NPDES program will insure that there are no significant adverse effects to the receiving waters. A detailed environmental assessment evaluating the potential effects of an additional outlet will be prepared and processed if and when a decision is made to develop the parallel runway.

Finally, the Proposed Action involves the development of additional on-site fuel storage facilities and a fuel delivery line from the storage tanks to the passenger terminal apron. The proposed storage facilities would include berms and impermeable membranes that would keep petroleum products that accidentally escaped from the storage tanks from contaminating soil or groundwater. In addition, the presence of the concrete drainage channel that separates the proposed fuel storage area from Kanaha Pond provide positive protection against the spread of contaminants into the Pond. The exact degree of protection that will be afforded is dependent upon the detailed design of the storage facilities and fuel lines. Because of this, a detailed environmental assessment for these facilities will be prepared when specific plans are available.

## 5.3 NATURAL HAZARDS

### 5.3.1 EXISTING CONDITIONS

The natural hazards that are of greatest concern at Kahului Airport are earthquakes, tsunamis, and flooding.

#### Earthquake Hazards

The earthquakes most likely to affect Kahului Airport originate in two different areas: 1) the Molokai Seismic Zone, including the island of Maui, and 2) the Island of Hawaii. The Molokai Fracture Zone is a series of fractures in the sea floor that stretch all the way from the Hawaiian Islands to Baja California. Most of the fracture zone is seismically inactive, but significant earthquakes are associated with the portion near Hawaii.

Earthquakes with epicenters on or near the Island of Hawaii stem from both volcanic and tectonic activity. Most of the volcanically related earthquakes there are associated with the underground movement of magma and are relatively small. However, sometimes magma builds up to such a high pressure that the surrounding rock fractures. This can produce large earthquakes, such as the Great Ka'u earthquake of 1868 and the 1975 Big Island earthquake. Tectonic earthquakes result when the earth's crust cracks under the great weight of the volcanoes that make up the islands in the Hawaiian chain and from the slumping and crumbling of the old volcanoes. The Kona earthquake of 1951 (magnitude 6.9) has been attributed to such an outward and downward movement of the flank of Mauna Loa along the Kealakekua Fault.

The magnitude of an earthquake is a measure of its energy content and , therefore, of its ability to do damage. Several different scales are currently used to characterize these events, with the Richter and Modified Mercalli scales being the most common. The Richter scale is the most commonly used today, and is used in the following discussion.

Based on a review of the data from earthquakes recorded on Maui during historical times, Furumoto (October 31, 1991) concluded that two large earthquakes in the Molokai Fracture Zone, one on February 18, 1871, and the other on January 23, 1938, and the Great Ka'u Earthquake of 1868, probably produced earthquakes of magnitude 7 in East Maui. The epicenter of the January 1938 earthquake is estimated to be approximately 30 miles northeast of Kahului Airport. Analyzing earthquakes on a statistical basis, Furumoto concluded that an earthquake of Magnitude 7 or greater could occur on East Maui on the average of once every 37 years. He further estimated that there is a 90 percent probability that an earthquake with a magnitude of 7 or greater will affect Kahului before 2065.

#### Tsunami and Flooding Hazards

Tsunamis have been observed and recorded on all major Hawaiian islands. Since 1946, significant tsunamis recorded for the island of Maui have occurred in 1946, 1957, 1960, and 1964. With the exception of the 1946 tsunami, recorded wave heights along the shoreline area between the Spreckelsville Beach houses and Kahului Harbor were generally between 8 and 17 feet. During the 1946 tsunami, wave heights of 22 and 28 feet were recorded at Kahului Harbor and the shoreline near the end of Runway 20 respectively.

The flood zone designations for the Kahului Airport project site are shown on Figure 5.3.1. These designations are based upon the Flood Insurance Rate Map (Community-Panel Number 150003 0190 C, revised September 6, 1989). It should be noted that the flood area shown along Kalialinui Gulch (Zones A4 and A5) is based upon drainage conditions before improvements to Kalialinui Gulch. With the completion of Kalialinui Gulch improvements in 1990, previous flooding in this area should be largely alleviated. As shown on the figure, the flood area generally extends 1,000 to 2,000 feet inland from the shoreline and is classified as Zone V23. A band of land located approximately 250 feet wide just inland of Zone V23 is classified Zone A4, while Zone A5 is located by the Kalialinui Gulch drainage channel.

Zone V23 is defined as a special flood hazard area along coasts inundated by the 100-year flood which has additional velocity hazards associated with waves of 3-foot amplitude or greater. Zone V23 has a Flood Hazard Factor (FHF) of 130 indicating a 13 foot difference between 100 and 10-year flood elevation levels. Zones A4 and A5 are defined as special flood hazard areas inundated by the 100-year flood. These zones have a FHF of 020 and 025 indicating a 2 and 2.5 foot difference between 100 and 10-year flood elevation levels respectively.

Existing land uses located within Zone V23 generally include portions of Runway 5-23 and Runway 2-20, Spreckelsville Beach houselots, Kanaha Beach Park, Kanaha Pond, Wailuku-Kahului Water Reclamation Facility, and Kahului Harbor. Most of Kahului Airport and related facilities are located in Zone C, which is defined as areas of minimal flooding.

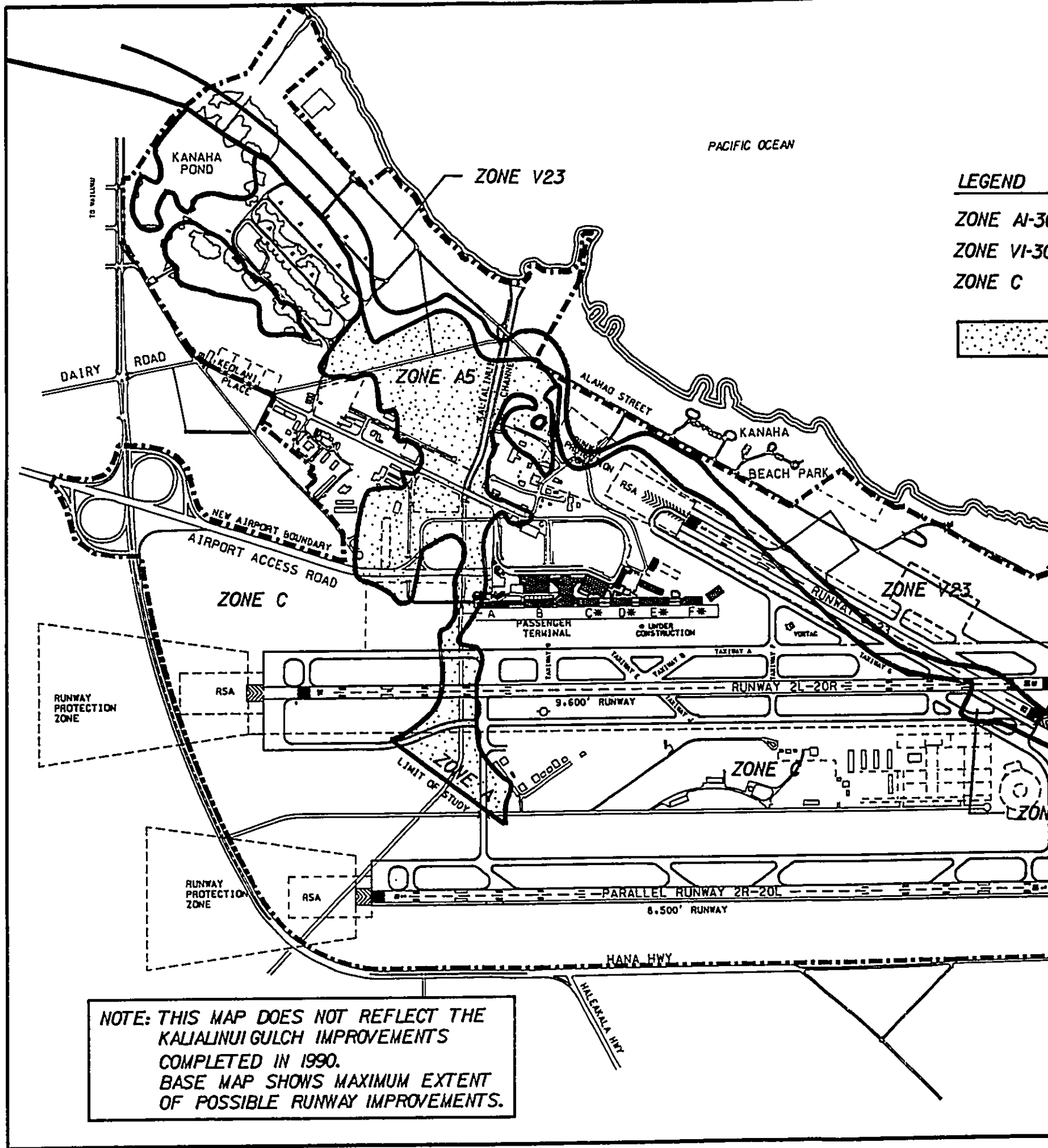
### 5.3.2 PROBABLE IMPACTS

#### No Action Alternative

Under both the Base and Constrained No-Action Scenarios, no changes to existing airport facilities would occur, therefore, there would be no change in existing hazard exposure. The possibility that airport activity levels might be slightly lower than if the proposed were implemented would not reduce or otherwise significantly alter the exposure to existing hazards.

#### Proposed Action

The Proposed Action would not increase the magnitude or frequency of earthquakes. Proposed facilities will be designed to resist the stresses that can reasonably be anticipated in accordance with established building standards. Because of this, they would not increase the exposure to earthquake-related hazards.



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**LEGEND**

- ZONE A1-30 100 YEAR FLOOD.
- ZONE VI-30 100 YEAR FLOOD WITH VELOCITY.
- ZONE C 100 YEAR MINIMUM FLOOD.



AREA WHERE FLOOD HAZARD  
HAS BEEN GREATLY REDUCED  
BY KALIALINUI GULCH IMPROVEMENTS.

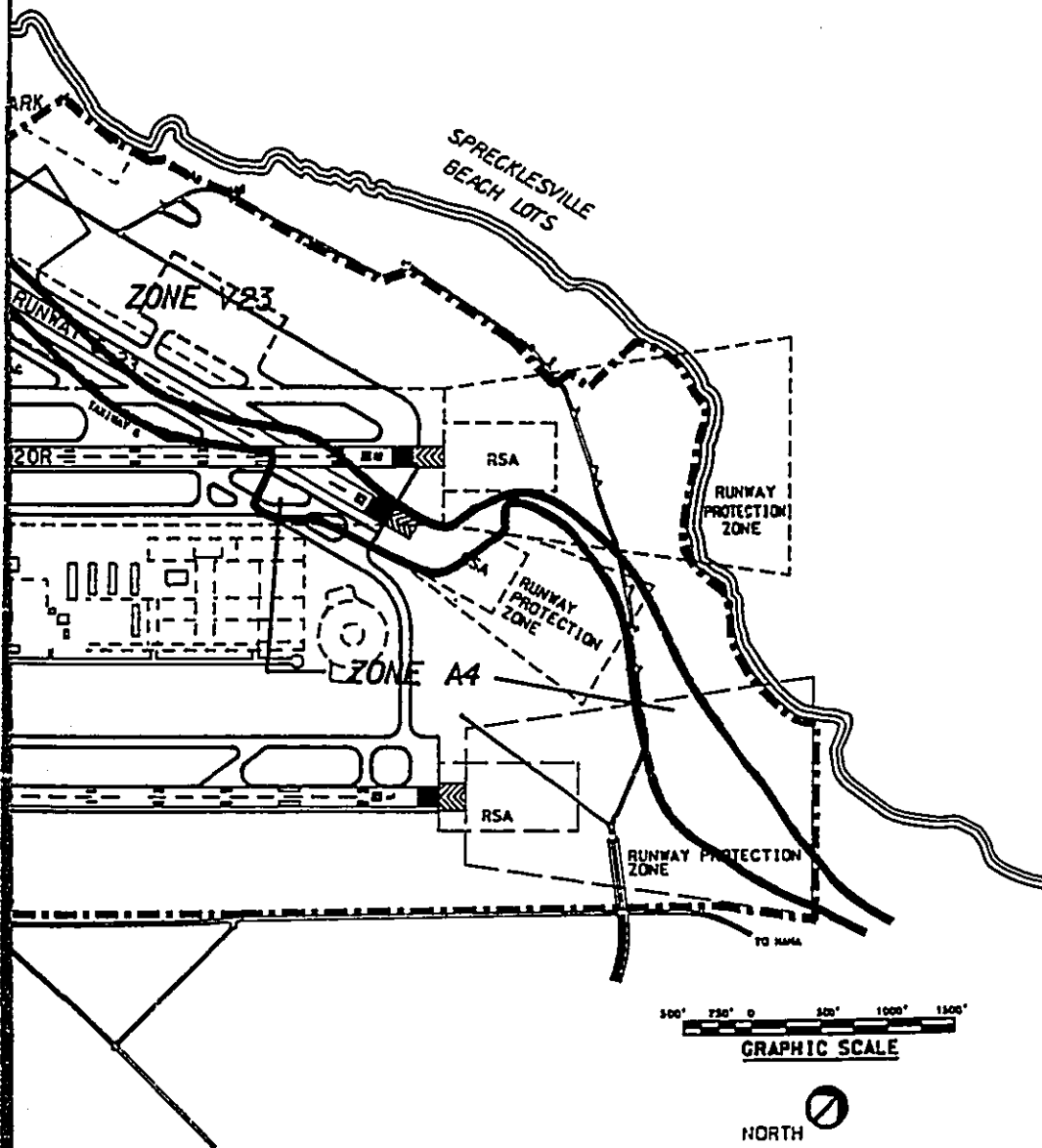


FIGURE 5.3.1

PROJECT TITLE:

KAHULUI  
AIRPORT  
E.I.S.

PROJECT NO.:

SHEET TITLE:

FLOOD ZONE  
DESIGNATION MAP

DATE:  
JULY 1992

SHEET NO.:

DATE:



New facilities susceptible to flood damage will be situated outside the Kalialinui Gulch and other existing floodways. However, several proposed actions are within the coastal high hazard area identified on the map. These include the Kanaha Beach Park Improvements, the transient aircraft parking apron, the relocated VORTAC, portions of the new cargo area access road, and a few taxiway segments. None of these projects would involve a high concentration of people, and can be designed to minimize adverse structural effects from a tsunami.

The Alahao Street/Old Stable Road Emergency Access connection would provide a major improvement in the event of a natural hazard such as a tsunami by providing alternative routes for evacuation of the area. It would also serve as a bypass road for vehicular traffic in the event flooding occurs along Hana Highway.

To minimize potential damage to proposed facilities, they should be designed and constructed in full compliance with all applicable building codes and standards. Large volumes of fill to create level building sites should be avoided if possible.

## 5.4 VISUAL ATTRIBUTES

The Maui Coastal Scenic Resources Study<sup>2</sup> (Scenic Study) and the Coastal View Study<sup>3</sup> (Coastal Study) were incorporated into the assessment of visual impacts. Visual resources identified by the Scenic Study within the immediate vicinity of Kahului Airport were used to assess probable impacts resulting from proposed airport facilities.

### Study Methodology

The study methodology implemented to evaluate the probable visual impacts consisted of:

1. Identifying visual resources that may be impacted by the project.
2. Using design principles to evaluate existing resources in terms of high, medium and low visual quality.
3. Evaluate the probable change to identified resources with the project.

The Scenic Study identifies resources in terms of five classifications which are: 1) Land Forms, 2) Coastal Views, 3) Mauka Views, 4) Open Space, and 5) Sites of Natural Beauty. These resources were further identified as being either "Distinctive" or "Noteworthy" visual resources. In addition, seven design principles are described which provide a framework for evaluating the quality of existing visual resources. These principles are: 1) Scale and Proportion, 2) Unity and Variety, 3) Repetition and Rhythm, 4) Balance, 5) Directional Forces, 6) Emphasis and Subordination, and 7) Contrast.

To assess probable impacts to identified resources, these seven principles were characterized in terms of either high, moderate, or low visual quality. These are qualitative measures developed in the Coastal Study helping provide a framework for determining the degree of visual significance associated with the resource.

<sup>2</sup> Maui Coastal Scenic Resources Study, prepared by Environmental Planning Associates, Inc., County of Maui Planning Department, August 31, 1990.

<sup>3</sup> Chu, Michael, S. and Jones, Robert B., Coastal View Study, City and County of Honolulu Department Of Land Utilization, 1987.

Existing visual resources were then assessed with and without the proposed airport improvements. Changes to existing resources were then evaluated to determine probable visual impacts based upon the degree of change in visual quality using the seven design principles.

#### 5.4.1 EXISTING CONDITIONS

Using the Scenic Study's Sectional Map for the Kahului to Paia area (Chapter 8: Appendix), no Coastal Land Forms were identified as visual resources in the immediate vicinity of Kahului Airport.

##### Coastal Views

The view of the coastline from Kanaha Beach Park towards West Maui was identified as a Noteworthy Coastal View. This coastline view is created through the combined effects of the ocean, West Maui mountains, and natural amenities along the coast resulting in generally high visual qualities.

##### Mauka Views

The view of Haleakala Crater and the West Maui mountains from Hana Highway provide unique visual resources due to their size and natural features. As a result, the view of Haleakala Crater from Hana Highway after Dairy Road, and around the Airport, were classified as "Distinctive Mauka Views." The views of the West Maui mountains from Hana Highway were also classified as Distinctive Mauka Views. Both of these views of Haleakala Crater and West Maui mountains are considered to have generally high visual qualities.

### Important Open Spaces

The Airport area was identified as a Noteworthy Important Open Space resource. This open area surrounding Kahului Airport bordered by Hana Highway predominantly consists of agricultural land used for sugar production. As a result, this man-modified open space area was considered to have only moderate visual qualities.

### Sites of Natural Beauty

Two visual resources in the immediate area of the Airport are identified as Sites of Natural Beauty in the Scenic Study. One resource was the line of trees seen from Hana Highway at its intersection with Kala Road which was classified as a Noteworthy site. The other visual site was of Kanaha Pond viewed from Hana Highway makai of its intersection with Dairy Road. These sites are considered to generally have "moderate" and "high" visual qualities, respectively.

## 5.4.2 PROBABLE IMPACTS

Probable visual impacts resulting from the proposed airport improvements were assessed based upon the degree of change to existing visual characteristics of identified resources in terms of the seven design principles developed in the Scenic Study. Table 5.4.1 shows the results of the analysis for existing and No Action conditions, and the Proposed Action.

Table 5.4.1. Visual Resource Classification Analysis

Design Principles	Existing Conditions & No Action Alternative	Proposed Action
<b>Coastal View: Kanaha Beach Park toward West Maui</b>		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	High	High
Balance	High	High
Directional Forces	Moderate	Moderate
Emphasis & Subordination	Moderate	Moderate
Contrast	High	High
<b>Mauka View: Haleakala Crater from Hana Highway (past Dairy Road)</b>		
Scale & Proportion	High	High
Unity & Variety	High	Moderate
Repetition & Rhythm	Moderate	Moderate
Balance	Moderate	Moderate
Directional Forces	High	High
Emphasis & Subordination	High	Moderate
Contrast	High	High
<b>Mauka View: Haleakala Crater from Hana Highway (Airport Area)</b>		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	Moderate	Moderate
Balance	Moderate	Moderate
Directional Forces	High	High
Emphasis & Subordination	High	High
Contrast	High	High
<b>Mauka View: West Maui Mountains from Hana Highway</b>		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	Moderate	Moderate
Balance	Moderate	Moderate
Directional Forces	High	High
Emphasis & Subordination	High	High
Contrast	High	High

Table 5.4.1. Visual Resource Classification Analysis (continued)

Design Principles	Existing Conditions & No Action Alternative	Proposed Action
<b>Important Open Space: Airport Area</b>		
Scale & Proportion	Moderate	Low
Unity & Variety	Moderate	Low
Repetition & Rhythm	Moderate	Low
Balance	Moderate	Low
Directional Forces	Moderate	Low
Emphasis & Subordination	Moderate	Low
Contrast	Moderate	Low
<b>Sites of Natural Beauty: Line of Trees</b>		
Scale & Proportion	Moderate	Moderate
Unity & Variety	Moderate	Moderate
Repetition & Rhythm	Moderate	Low
Balance	Moderate	Moderate
Directional Forces	High	Moderate
Emphasis & Subordination	Moderate	Moderate
Contrast	High	Moderate
<b>Coastal Land Form: Kanaha Pond</b>		
Scale & Proportion	High	High
Unity & Variety	High	High
Repetition & Rhythm	Moderate	Moderate
Balance	High	High
Directional Forces	Moderate	Moderate
Emphasis & Subordination	High	High
Contrast	High	High

Source: Pacific Planning & Engineering, Inc.

### No-Action Alternative

Under the No-Action Alternatives, no major changes to existing facilities at Kahului Airport are expected. Therefore, there were no changes to the existing visual qualities of identified visual resources in terms of the seven design principles described in the Scenic Study. As a result, there should be no impact to identified visual resources for both the Base and Constrained No-Action Scenarios.

### Proposed Action

Overall, the Proposed Action should have minor impacts to existing visual resources identified near Kahului Airport by the Scenic Study. The most important visual resources, classified as Distinctive by the Scenic Study, should generally retain their existing high visual qualities. These resources include mauka views of Haleakala Crater and West Maui mountains, and of Kanaha Pond from Hana Highway. The main impacts to identified visual resources are expected to be the open space area around the Airport and line of trees at the intersection of Hana Highway with Kala Road which are both classified as Noteworthy resources.

The Proposed Action, with the exception of Kanaha Beach Park improvements, will not be located within the coastal view from Kanaha Beach Park towards the West Maui mountains. Consequently, the existing visual quality of this coastal view should not change. The proposed beach park improvement is not expected to reduce the visual quality of the coastal view but will instead create additional park space for individuals contributing to additional views of the coast.

The Airport Access Road's proposed interchange with Hana Highway may decrease the visual quality of the mauka view of Haleakala from the highway between Kaahumanu Avenue and the interchange location. However, this interchange should not decrease the visual quality of the mauka view of the West Maui mountains. The remaining projects are not expected to be alter the visual quality of these mauka views because they will not be located mauka of Hana Highway.

The extension of Runway 2-20, the new parallel runway and taxiways will significantly change the existing character of the open space area by removing existing agricultural land. Consequently, this open space area's visual quality is expected to decrease. The other projects of the Proposed Action should not further decrease the visual quality of this area since they will not be located on the agricultural land removed.

The existing visual qualities of Kanaha Pond from Hana Highway are not expected to be impacted because the Proposed Action will not occur within the Kanaha Pond boundary or be located within the line of site from Hana Highway makai of Dairy Road.

The line of trees located at the intersection of Hana Highway with Kala Road may be impacted by construction of the parallel runway which will eliminate access to the Airport from Kala Road. As a result, some of these trees located makai of Hana Highway may need to be removed, however, the bulk of these trees located mauka of the highway should not be impacted. Therefore, the visual quality of this site may be slightly decreased.



To minimize the visual impacts to the line of trees along Kala Road resulting from construction of a parallel runway, the remaining trees located mauka of the highway will be preserved. If possible, those trees located makai of the highway needing to be removed could be relocated mauka of the highway next to the remaining trees. Although the construction of the parallel runway will remove existing agricultural land serving as an open space visual resource, appropriate landscaping and providing an open space buffer between Hana Highway and the runway will be implemented.

Although certain airport facilities, such as cargo buildings, should not impact the view of identified visual resources from Hana Highway, they will be constructed with appropriate setback distances to minimize view obstructions from internal roadways such as Keolani Place. Further, these improvements will be appropriately designed and landscaped to blend in with the surrounding environment and visual sight lines.

## 6.0 NATURAL ENVIRONMENT

### 6.1 TERRESTRIAL FLORA

This Section discusses the potential impacts to existing vegetation, and the presence of any threatened and endangered plants at Kahului Airport. A botanical survey conducted by Char and Associates is included in its entirety as Appendix C.

#### 6.1.1 EXISTING CONDITIONS

Field studies to assess the botanical resources on the airport property were conducted on July 10 and 11 1990. The primary objectives of the field studies were to: (1) provide a general description of the major vegetation types; (2) inventory the terrestrial, vascular flora; and (3) search for threatened and endangered plant species protected by federal and state laws.

A walk-through survey method was employed. Notes were made on plant associations and distribution, substrate types, topography, exposure, etc. Species were identified in the field; plants which could not be positively determined were collected for later identification in the herbarium or for comparison with the most recent taxonomic treatment. The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions under which the survey was conducted. A survey taken at a different time of year and under varying environmental conditions would no doubt yield slight variations in the species checklist, however, there is no evidence the variations would be significant.

Four major vegetation types were recognized on the project site and described in more detail below. Landscaped and developed areas were not surveyed as such places are not likely to harbor sensitive native plant communities or rare native species. Common landscaping materials used around the airport facility include: coconut (Cocos nucifera), tiger's claw (Erythrina variegata), autograph tree (Clusia rosea), pink tecoma (Tabebuia pentaphylla), and various Bougainvillea and Hibiscus hybrids.

#### 1. Cane Fields

Actively cultivated fields of sugar cane (Saccharum officinarum) are found in the area between the present facility and the Hana Highway. Along the margins of fields, where they abut koa-haole shrublands, roadways, drainage ditches, and old concrete foundations (next to the Airport), weedy species are more numerous and varied. Within the cane fields themselves, only the Nutgrass (Cyperus rotundus) is occasional; the fast-growing cane tends to shade-out most of the other weedy species.

#### 2. Koa-haole Shrubland

This vegetation type is composed of koa-haole (Leucaena leucocephala) shrubs with a dense cover of buffel grass (Cenchrus ciliaris), green panic grass, or Guinea grass (Panicum maximum) among the shrubs. At least four variants of this shrubland, usually representing various stages of succession, can be recognized on the site. In the southern runway protection zone, the shrubland consists of scattered short koa-haole, from 1 to 3 feet tall. This area has only recently been taken out of sugar cane cultivation. In the runway protection zone fronting Spreckelsville Beach Road and near Runway 5-23, the koa-haole shrubs become denser and taller. In the area between the helicopter facility and the FAA Air Traffic Control Tower, the shrubland consists of koa-haole shrubs from 5 to 7 feet tall and with 50 to as much as 80 percent cover. The shrubland becomes very dense and tall (from 12 to 15 feet) on the area east of the planned transient apron and along the perimeter fence facing Kanaha Beach Park.

### 3. Kiawe Forest

This vegetation type is found primarily in the area between the Airport and the beaches - Spreckelsville Beach lot residential area and Kanaha Beach Park. The forest behind the residential area is characterized by closed canopy stands of kiawe trees, from 30 to 35 feet tall. Along the Kanaha Beach boundary and adjacent to the Kanaha Pond refuge, the kiawe forest is open (canopy cover less than 60 percent) and somewhat shorter, 18 to 25 feet tall.

### 4. Mixed Coastal Shrubland

This vegetation type is characterized by a varied assortment of different tree and shrub species occurring in scattered localized patches or clumps. Among the most frequently encountered plants are beach naupaka (Scaevola sericea), hau, milo, the three pluchea species, beach heliotrope (Tournefortia argentea), vitex (Vitex trifolia var. subtrisecta), and ironwood.

Of a total of 146 plant species inventoried during the survey, 125 (86 percent) are introduced; two (1.4 percent), including sugar cane, are originally of Polynesian introduction; and 19 (12.6 percent) are native. Of the natives, 18 are indigenous, that is, they are found in the Hawaiian Islands and elsewhere throughout the Pacific; only one, the 'aheahea or 'aweoweo (Chenopodium oahuense), is endemic, that is, native only to the islands. None of the native species are officially listed threatened and endangered plants; nor are any proposed or candidate for such status (U. S. Fish and Wildlife Service 1989, 1990). An earlier biological survey of the existing airport property (AECOS, Inc. 1981) also recorded similar findings.

No botanical field studies were conducted for the Kanaha Pond Wildlife Refuge because no improvements are under consideration that would directly affect the area. However, a number of biological studies of the area have been previously conducted. A U. S. Army Corp of Engineers' wetlands report prepared in 1977 (Wetlands and Wetland Vegetation of Hawaii, by M. E. Elliott and E. M. Hall) describes the botanical resources and provides a species checklist for Kanaha Pond Wildlife Refuge.

#### 6.1.2 PROBABLE IMPACTS

No officially listed threatened and endangered plants, or any plants proposed or candidates for such status are known to exist at the Airport. Although no significant diminishment of native species will occur, an effort will be made to mitigate the loss of the few that would be affected by cultivating them elsewhere on the site. The remaining vegetation within the areas being considered for development have been disturbed at one time or another. The Proposed Action may involve the loss of some of the existing vegetation. However, no significant negative impacts are expected because the vegetation consists primarily of introduced or alien plant species. The few native vegetation species found on the site occur throughout the islands in similar environmental conditions.

#### 6.2 TERRESTRIAL FAUNA

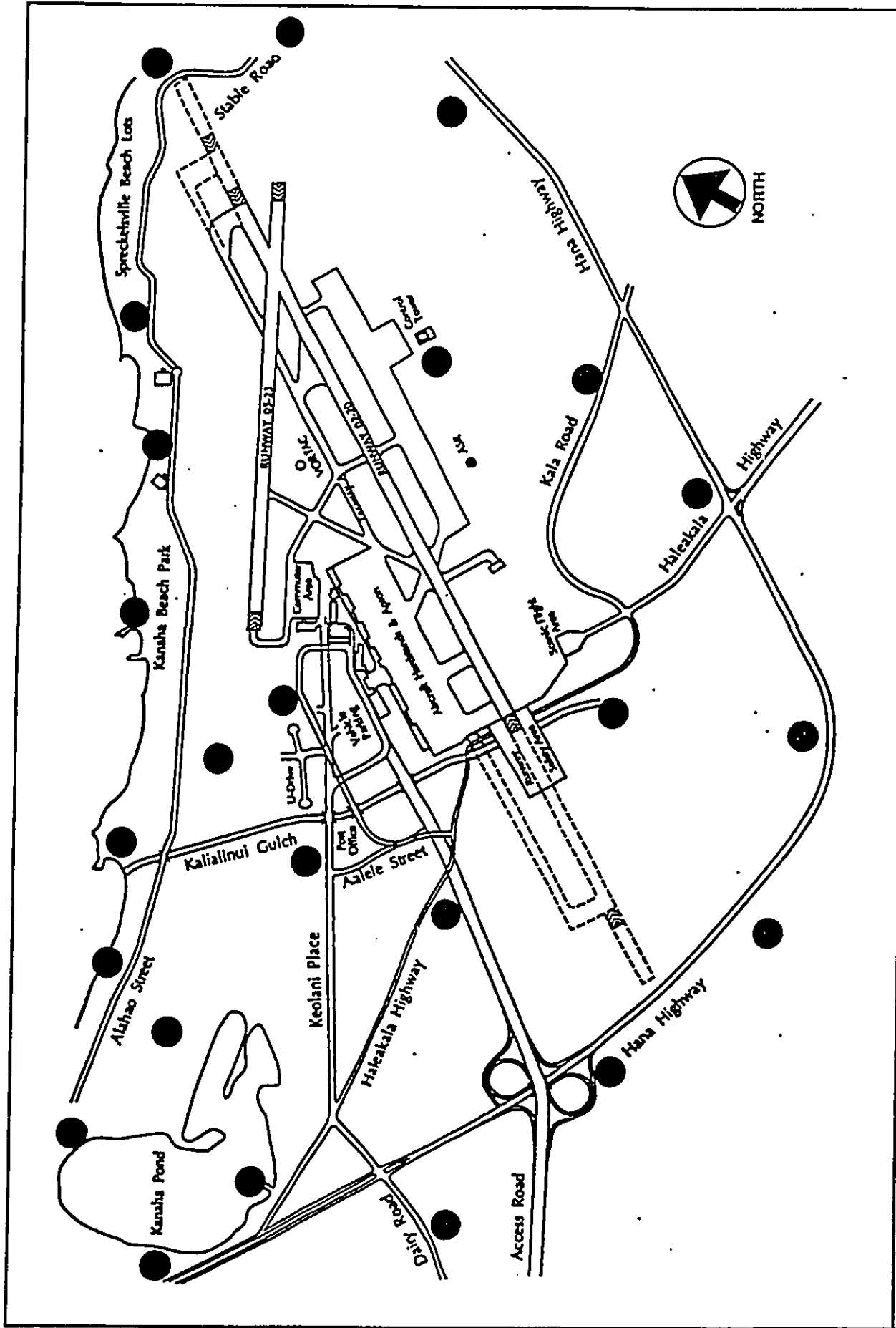
This Section discusses the potential impacts to avifauna and feral mammals at Kahului Airport and the presence of any species that are considered to be endangered or threatened. The survey of avifauna and feral mammals conducted by Mr. Phillip L. Bruner is included in its entirety as Appendix D.

### 6.2.1 EXISTING CONDITIONS

A bird and mammal field survey of Kahului Airport lands was conducted on July 10-11, 1990. The objectives of the field survey were to:

1. Document what bird and mammal species occur on the property or may likely occur given the type of habitats available.
2. Provide baseline data on the relative abundance of each species.
3. Determine the presence or likely occurrence of any native fauna particularly any that are considered "Endangered" or "Threatened." If any occur or may likely be found on the property identify what if any features of the habitat may be essential for these species.
4. Determine if the property contains any special habitats that if lost or altered by development might result in a significant impact on the fauna in this region of the island.
5. Note which aspects of the projects pose the most significant concerns for wildlife and suggest what measures should be considered to avoid these problems.

Figure 6.2.1 shows the locations at which wildlife counts were taken. The Kanaha Pond Wildlife Refuge and surrounding wetlands comprise the most important bird habitat in the study area. The lands currently in use by the Airport provide a mixture of habitat types varying from open grassy fields and airfields to second growth brush covered lands and developed areas such as parking lots and passenger terminal. Sugar cane fields and a narrow strip of coastal forest dominated by Kiawe (*Prosopis pallida*) and other exotic plants along with the typical native coastal vegetation make up additional terrestrial habitats available for wildlife. Parklands and residential yards are also present along this coast. The exposed beach and rocky intertidal zone fronting the entire length of the property also provides foraging opportunities for migratory shorebirds.



Airports Division  
 Department of Transportation  
 State of Hawaii

Fauna Survey Area, with Census Stations

PACIFIC PLANNING  
 ENGINEERING INC.  
 Source: Phillip L. Bruner

Figure  
 6.2.1

#### 6.2.1.1 Study Methodology

Field observations were made with the aid of binoculars and by listening for vocalizations. At various locations, and in all representative habitats shown on Figure 6.2.1, counts were made of all birds seen or heard. Between these count stations, walking tallies of birds seen or heard were also kept. Observations of feral mammals were limited to visual sightings and evidence in the form of scats and tracks.

#### 6.2.1.2 Field Survey Results

##### Resident Endemic (Native) Birds:

Two endemic species were recorded: the Hawaiian Stilt (Himantopus mexicanus knudseni) and the Hawaiian Coot (Fulica americana alai). These two birds and possibly the Hawaiian Duck (Koloa) are endangered birds living at Kanaha Pond Wildlife Refuge. No other endemic birds were recorded on the survey. One possible specie which may occasionally occur on Kahului Airport property is the Hawaiian Owl or Pueo (Asio flammeus sandwichensis). Pueos are considered to be reasonably common in grassland and ranch land habitat on Maui but are seen less frequently in more urban habitat (Hawaii Audubon Society 1989).

The State Department of Land and Natural Resources (DLNR) has actively managed Kanaha Pond since the 1970's. A Kanaha Pond Management Committee has recently been formed to formulate a Management Plan for the Pond. The Hawaiian Stilt has been observed feeding in Kalialinui Gulch and could be using the makai side of the mid-section of Runway 5-23 during periodic periods of ponding as a seasonal feeding area.



Migratory Indigenous (Native) Birds:

Migratory shorebirds winter in Hawaii between the months of August through May. Of all the shorebirds species which winter in Hawaii, the Pacific Golden Plover (*Pluvialis fulva*) is most abundant. Plovers prefer open areas such as mud flats, lawns, pastures, plowed fields and roadsides. A total of only four plovers were recorded at the east end of Runway 5-23. This result was expected since the majority of plovers are at breeding grounds in the Arctic during this time of the year. During the months of August through April several hundred plovers are likely to occur in this area (Bruner 1981).

Ruddy Turnstone (*Arenaria interpres*) is another common migrant that utilizes fields and lawns as well as intertidal habitat. Although the majority of the Turnstone population are in the Arctic during this time of the year, a total of 36 Turnstones have been sighted on grassy fields within the airport complex and along the shoreline during the two day survey. No other migratory shorebirds were found during the survey. Two other common species which might be expected to occur in this area during the "winter" include Wandering Tattler (*Heteroscelus incanus*) and Sanderling (*Calidris alba*). Occasionally other migratory shorebirds turn up at Kanaha Pond (State of Hawaii 1990).

Migratory waterfowl (ducks) also utilize Kanaha Pond. The two most common migratory ducks are Northern Pintail (*Anas acuta*) and Northern Shoveler (*Anas clypeata*). Three female and one male shoveler were seen at Kanaha Pond during the first day of the survey.

Resident Indigenous (Native) Birds:

This category includes only those species which are native but not endemic such as the Black-crowned Night Heron (*Nycticorax nycticorax*). Night heron are common at Kanaha Pond (State of Hawaii 1990).

#### Resident Indigenous (Native) Seabirds:

None were observed on the property. Seabirds can be seen off shore and some species such as the Great Frigatebird (Fregata minor) do come in over land. This species will often use ponds such as Kanaha to get access to drinking water.

#### Exotic (Introduced) Birds:

A total of 14 species of exotic birds were recorded during the field survey. In addition to these species, other exotic birds which potentially could occur on the property include: Common Barn Owl (Tyto alba), Northern Mockingbird (Mimus polyglottus) and Eurasian Skylark (Alauda arvensis) (Bruner 1981; Pratt et al. 1987; Hawaii Audubon Society 1989).

#### Feral Mammals

Wild (feral) cats were seen at Kanaha Pond. Small Indian Mongoose (Herpestes auropunctatus) were also observed especially in the coastal patches of forest. No rats or mice were recorded, however, it would be highly unusual if these ubiquitous animals did not occur on the property. Maui records of the endemic and endangered Hawaiian Hoary Bat (Lasiurus cinereus semotus) are sketchy (Kepler and Scott 1990). None were observed during the field survey despite late evening observations.

The data presented above show that the areas that would be affected by possible improvements to Kahului Airport contain a fairly diverse range of habitats, and that these are utilized by the typical array of exotic species of birds one would expect in these types of second-growth disturbed environments in Hawaii. No unusual concentrations of any exotic species were discovered. Native birds, endemic and indigenous residents, as well as migrants utilize the Kanaha Pond and wetlands, coastal shoreline and grass covered margins around the runways. These environments provide essential habitat for nesting, foraging and resting. Data on feral mammals on the property were limited to observations.

## 6.2.2 PROBABLE IMPACTS

The Proposed Action does not include extending Runway 5-23 and does not infringe upon the 50 meter vegetation buffer and thereby minimizes noise and other disturbances to bird habitats. The Proposed Action is not expected to increase noise levels at the Pond compared to the No-Action Alternatives.

The probable impacts on ground and surface waters were previously discussed in Section 5.2. The probable impacts from the introduction of plant pests and animals is discussed in Section 9.5.

The flight kitchen facility and additional ground transportation subdivision facilities would be separated from Kanaha Pond by an existing concrete drainage ditch that would impede storm water runoff towards Kanaha Pond. The Keolani Place lease lots would be properly designed to also prevent storm water runoff from flowing into Kanaha Pond.

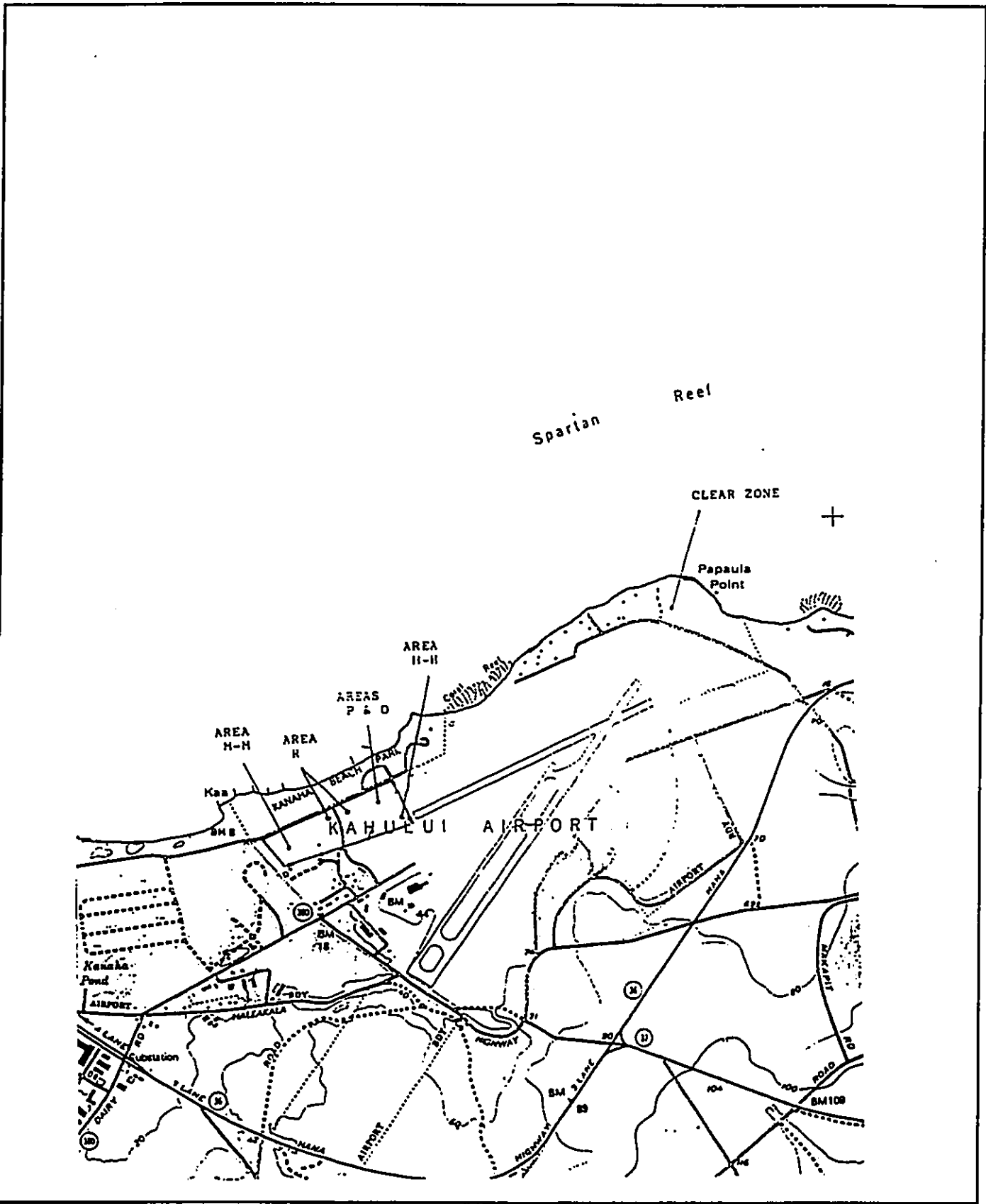
## **6.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES**

The following is a summary of the archaeological surveys conducted by Cultural Surveys Hawaii (CSH) which are included in their entirety in Appendix E. The objective of the surveys was to identify potential archaeological sites which would be affected by the Proposed Action.

### **6.3.1 SCOPE OF SURVEYS**

In July, 1990, a survey scope of work was developed in coordination with the State's Historic Preservation Office (SHPO) which included lands bounded on the north by Alahao Street, on the west by Kalialinui Drainage Channel, on the east by an unmarked north-south line near Kanaha Beach Park parking lots, and on the south by Kahului Airport Runway 5-23 and west runway protection zone. SHPO reviewed aerial photos along with prior surveys and determined that archaeological studies for the parallel runway and adjacent facilities areas were not needed. They concluded that "Based upon this negative finding (no significant historic sites were previously identified) and the extensive ground disturbance due to sugarcane cultivation, we believe that the proposed project will have "no effect" on significant historic sites." Figure 6.3.1 shows the July 1990 survey and subsurface testing areas which were determined to be required.

Based on the July 1990 survey results, it was recommended that the runway protection zone northeast of Runway 2-20 be subjected to subsurface backhoe testing for buried cultural deposits. The scope of work was further developed in coordination with SHPO and required a program of subsurface testing on both sides of the Spreckelsville Beach Road, including the runway protection zone on the north side. Excavation and documentation of a series of backhoe trenches averaging 10 linear feet per acre was proposed and accepted as an adequate sampling measure. Subsequently, a series of subsurface tests were performed in the runway protection zone area between April 22 through May 11, 1991.



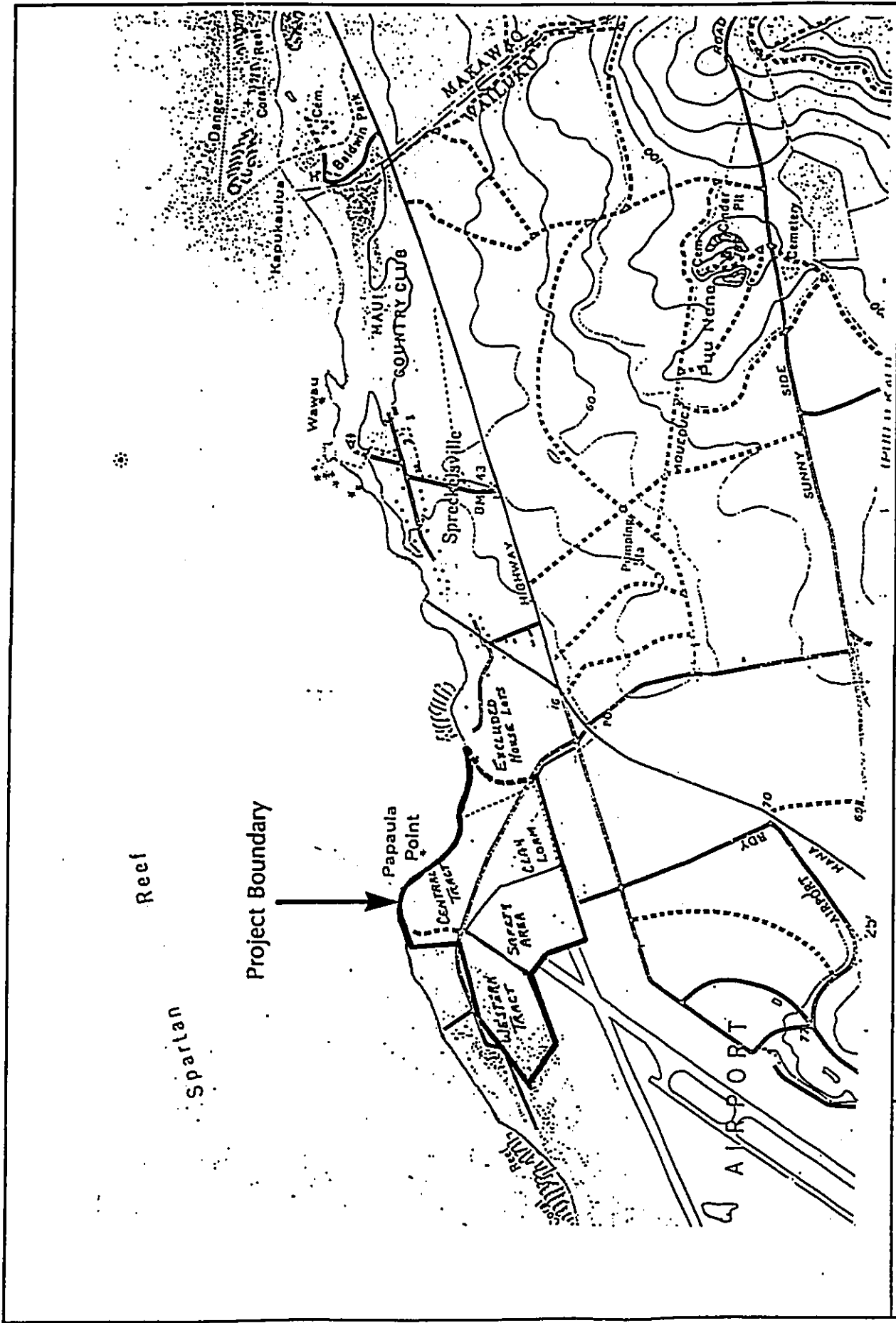
<p><b>Airports Division</b>          Department of Transportation          State of Hawaii</p>	<p><b>Historical &amp; Archaeological          Resources Survey Area</b></p>	<p><b>PACIFIC PLANNING</b>  <small>ENGINEERING, INC.</small>          Source: Cultural Surveys Hawaii</p>	<p><b>Figure          6.3.1</b></p>
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This survey area consisted of approximately 180 acres along the coast west of Spreckelsville as shown on Figure 6.3.2. Approximately 60 acres at the east end of the survey area were occupied by private beach lot homes and active pasturage and were therefore excluded from the survey. One archaeological site, BPBM-50-Ma-C9-37, has been recorded in this area (Archaeological Monitoring of Sewer Line Construction from Spreckelsville to Ku'au, Maui, State of Hawai'i, Clark and Toenjes, 1987).

### 6.3.2 PREVIOUS ARCHAEOLOGICAL RESEARCH

The survey area is remarkable from an archaeological point of view because of its lack of sites. The most recent archeological studies near Kahului Airport have found no archaeological sites, except for an undetermined number of burials, and a possible house site and grindstone located between Kanaha Beach Park and the western extent of the study area (Connolly, 1981; Welch, 1988 a & b and 1990). Both sites are located by Connolly just northwest of the intersection of existing Runways 5-23 and 2-20.

The most comprehensive and informative archaeological study to date along the northern shoreline of the isthmus between East Maui and West Maui is the monitoring of a sewer line project by Clark and Toenjes (1987). Their study area extends from near Spreckelsville, just east of the Airport to Ku'au. Although the area of excavation was restricted to narrow trenches for the pipeline and shallow bulldozing for access roads, significant archaeological sites related to traditional Hawaiian occupation and fishing were unearthed as were burials.



Airports Division  
 Department of Transportation  
 State of Hawaii

Archaeological Survey, Subsurface Test Sites

PACIFIC PLANNING  
 ENGINEERING, INC.  
 Source: Cultural Surveys Hawaii

Figure  
 6.3.2

### 6.3.3 SURVEY RESULTS

#### 6.3.3.1 Survey Results - July, 1990

The surface survey and subsurface testing did not locate any archaeological sites. The upper strata in all areas studied indicate deposition in historic times and widespread alteration more recently. An archaeological reconnaissance of the northeast runway protection zone of Runway 2-20 identified a buried A-horizon and two waterworn basalt boulder alignments in the northeast section of the runway protection zone.

#### Stratigraphic Examination

The primary purpose of stratigraphic examination in the study areas was to identify any cultural deposits and describe their interrelationships with the natural stratigraphic units present. The cultural layers (concrete rubble and slurry, pavements, and imported soil and gravel backfill) are all recent and make up the modern surface wherever they occur. In areas where these construction layers do not occur the modern surface consists of dune sand interbedded with fine eolian silt believed to be derived from plowed cane lands. This would suggest a post A.D. 1850 age for that stratigraphic unit.

Observations on the natural stratigraphic layers (basalt bed rock, in situ soil formations, alluvium and colluvium, beach sand, and eolian sand and silt) occurring in the profiles of the sixteen (16) test trenches shed some light on prior environmental conditions. The major stratigraphic units encountered in the excavations are as follows, from oldest to youngest:

1. Basalt Bedrock and C Horizon Sediments. Basalt bedrock was encountered above the water table in the east end (Areas P and O) of the project area at a minimum depth of about 1 meter below the surface. These are probably lavas of the Kula Volcanic Series of Haleakala volcano, thus of Pleistocene age.



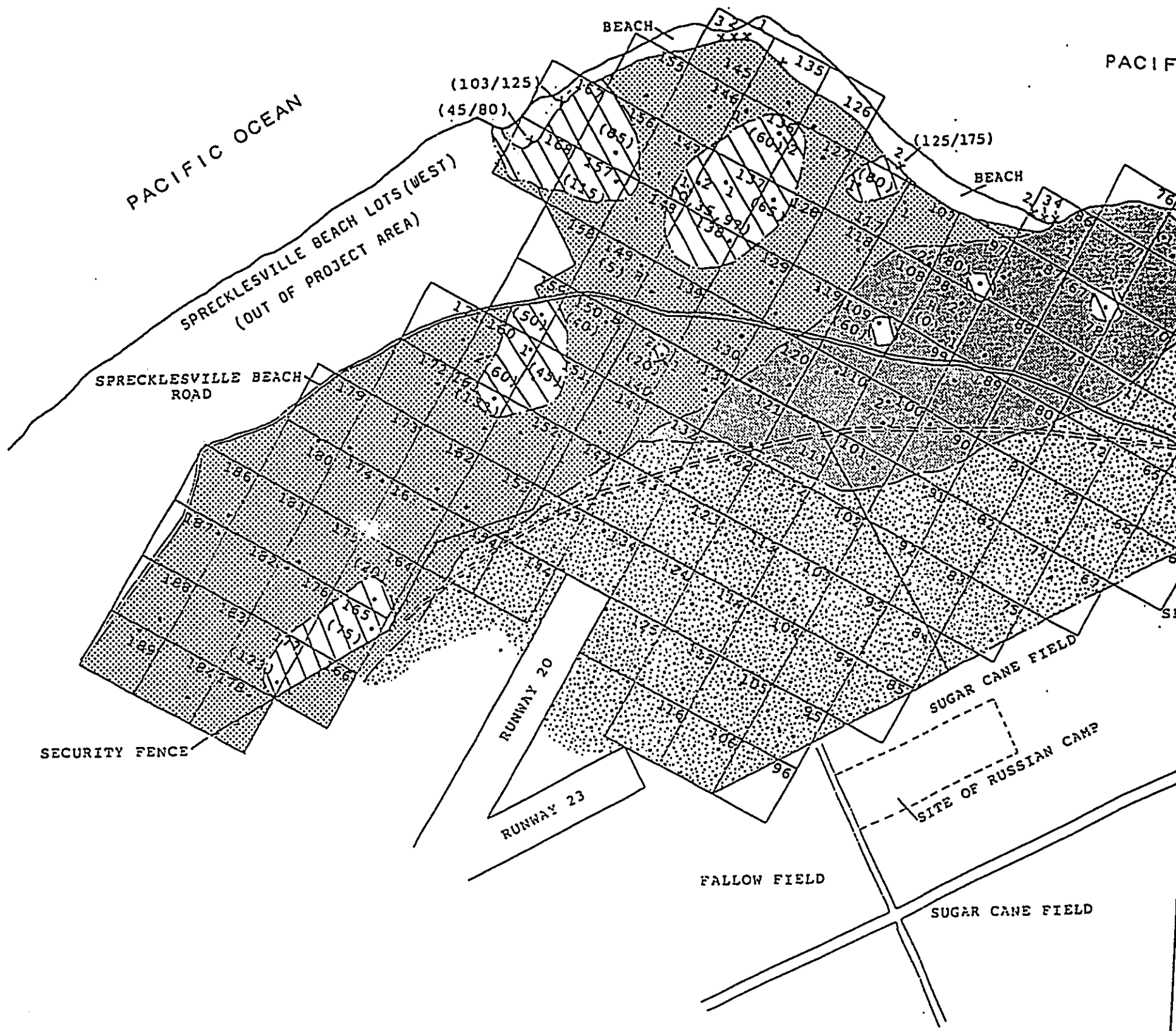
2. Beach Sand. The coarse coralline beach sand deposits encountered in the central and western portions of the project area occur predominantly at the ground water table.

3. Eolian Sand and Fine Silt. The eolian deposits consist of two distinct units in the project area. The stratigraphically older of these units consists of loose, very fine coralline sand. This dune deposit is culturally sterile and represents the earliest dune activity evidenced in the study area based on its stratigraphic position upon the ancient beach sand terrace in Trench 8. The second, more recent eolian depositional unit consists of thin (3 to 10 cm.) interbedded lenses of loose, very fine coralline sand and very fine brown silt. This layer is thought to be of historic age with the silt component originating from clearing and plowing of sugar cane fields in the immediate vicinity. No cultural material was found in this layer.

4. Modern Fill. Modern fill layers form the present land surface at the western and the eastern ends of the project area. They consist of concrete rubble, crusher rock gravels, imported top soil fills and asphalt pavements. These are of recent age associated with the development and use of the airfield, other military uses of the surrounding lands in the mid-20th century, and modern industry, specifically the fabrication and disposal of cement and concrete products.

#### 6.3.3.2 Subsurface Testing Results - May, 1991

During the period April 22 through May 11, 1991, approximately 120 acres were subjected to subsurface testing. A total of 109 trenches were excavated. Thirty trenches exposed deposits of cultural or apparent cultural significance buried roughly one to six feet below the present surface. Locations of these trenches are indicated on Figure 6.3.3. The majority of observed cultural deposits are probably associated with prehistoric Hawaiian occupation, though only five were demonstrably traditional Hawaiian in age. Archaeological material associated with the buried cultural strata was sparse. The very few artifacts observed were all basalt detritus or flakes which were recovered.



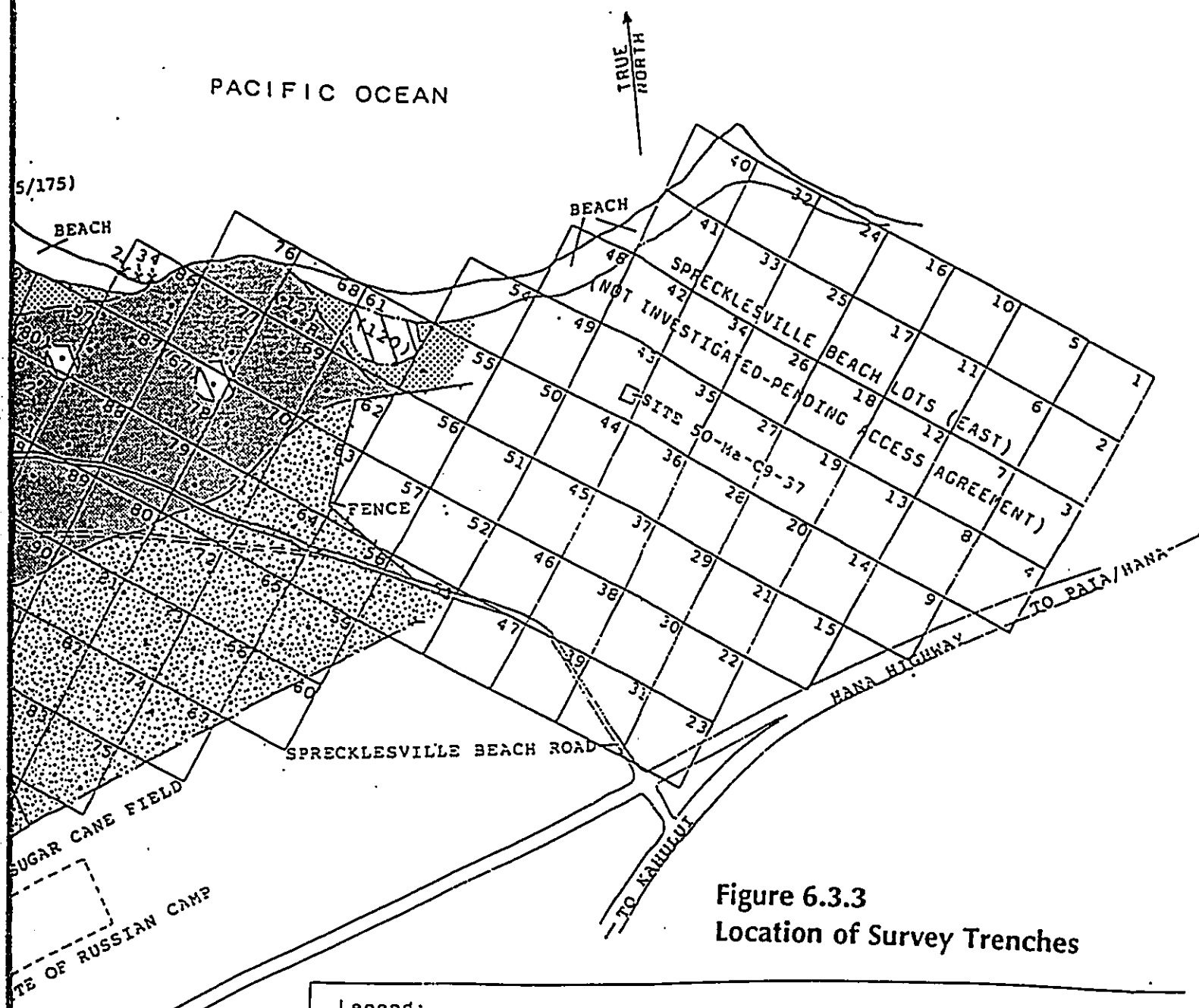
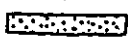
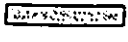

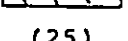


Figure 6.3.3  
Location of Survey Trenches

**Legend:**

-  CLAY LOAM DEPOSIT.
-  FINE SAND OVER CLAY.
-  FINE SAND OVER BEACH SAND/WATER TABLE.
-  ESTIMATED HORIZONTAL EXTENT OF SUBSURFACE CULTURAL DEPOSITS.
- (25) TOP DEPTH (CM BELOW SURFACE) OF CULTURAL DEPOSIT.
- H HISTORIC CULTURAL DEPOSITS PRESENT.
- .2 BACKHOE TRENCH LOCATION AND NUMBER (IF MORE THAN ONE).
- x HAND-EXCAVATED TRENCH LOCATION ALONG BEACH

0 200 400 FEET  
0 30 60 120 METERS

Source: Cultural Surveys Hawaii

Three hand-excavated trenches along the shoreline revealed evidence of successive occupation, and another 14 trenches exposed buried, prior, stable surfaces or A-Horizons. Many of the trenches exposed evidence of a variety of past environmental conditions including marine beach accretion and dune development, storm and flooding activity and lowland marsh conditions. All recognized surface features were clearly recent to late historic in age, including structural remains of Spreckelsville Beach Lot housing and possible facilities of the Kahului Naval Air Station.

The majority of the areas surveyed did not contain significant historic or cultural resources. The dearth of Hawaiian cultural remains in the areas north of the Kahului Airport seems clearly to be the result of prior historic activity beginning with the construction of the Kahului Railroad in the late 1800's. This work may have involved sand mining and grading of the area to improve it for pasturage which would account for the unnaturally level surface of the buried dune sand and subsequent growth of dunes of interbedded sand and silt. Further obliteration of evidence of former land use continued with the building of the Naval Air Station and its facilities and Kahului Airport, and probably with the development of Kanaha Beach Park as well. Based on the results of the subsurface testing and on the scarcity of archaeological data, the cultural deposits exposed are considered to be potentially very significant. Intensive recovery from these deposits is expected to provide an understanding of Hawaiian settlement pattern and a reconstruction of past environmental processes and present landform development in the area.

#### 6.3.4 PROBABLE IMPACTS

The Proposed Action would extend existing Runway 2L-20R to 9,600 feet by constructing a 2,600 foot extension to the southwest end of the runway. This extension is not expected to have any impact on archaeological resources. The land is former sugar cane land and has been heavily altered with repeated plowing for commercial agriculture.

The Proposed Action also involves the construction of a new 8,500 foot runway parallel to existing Runway 2L-20R between 2000 and 2010. No archaeological sites are expected to be found in the runway portion of the parallel runway because the land is either abandoned or presently cultivated sugar cane fields.

The northeast end of the parallel runway protection zone extends towards the homes in East Spreckelsville. Although subsurface testing was not performed on occupied house lots in East Spreckelsville in 1991 because of a lack of access agreements, there is clear indication that prehistoric cultural layers probably occur throughout a large portion of the East Spreckelsville houselots. In 1987, Bishop Museum performed archaeological monitoring of a sewerline installation project and found significant cultural deposits within the houselots. In 1991, CSH also identified potentially very significant cultural deposits on the northeast end of existing Runway 2L-20R.

Prior to construction of the parallel runway, the northern runway protection zone subsurface area will be tested, data recovery will be conducted, and a thorough data recovery plan will be implemented in accordance with State Historic Preservation Office guidelines for the correlation and analysis of Hawaiian occupations of this region of Maui.

## **6.4 NOISE IMPACTS**

### **6.4.1 INTRODUCTION**

This Section describes existing noise levels in the vicinity of Kahului Airport and discusses the noise implications of the Proposed Action. The noise impact study was conducted by Y. Ebisu & Associates and is included in its entirety as Appendix F.

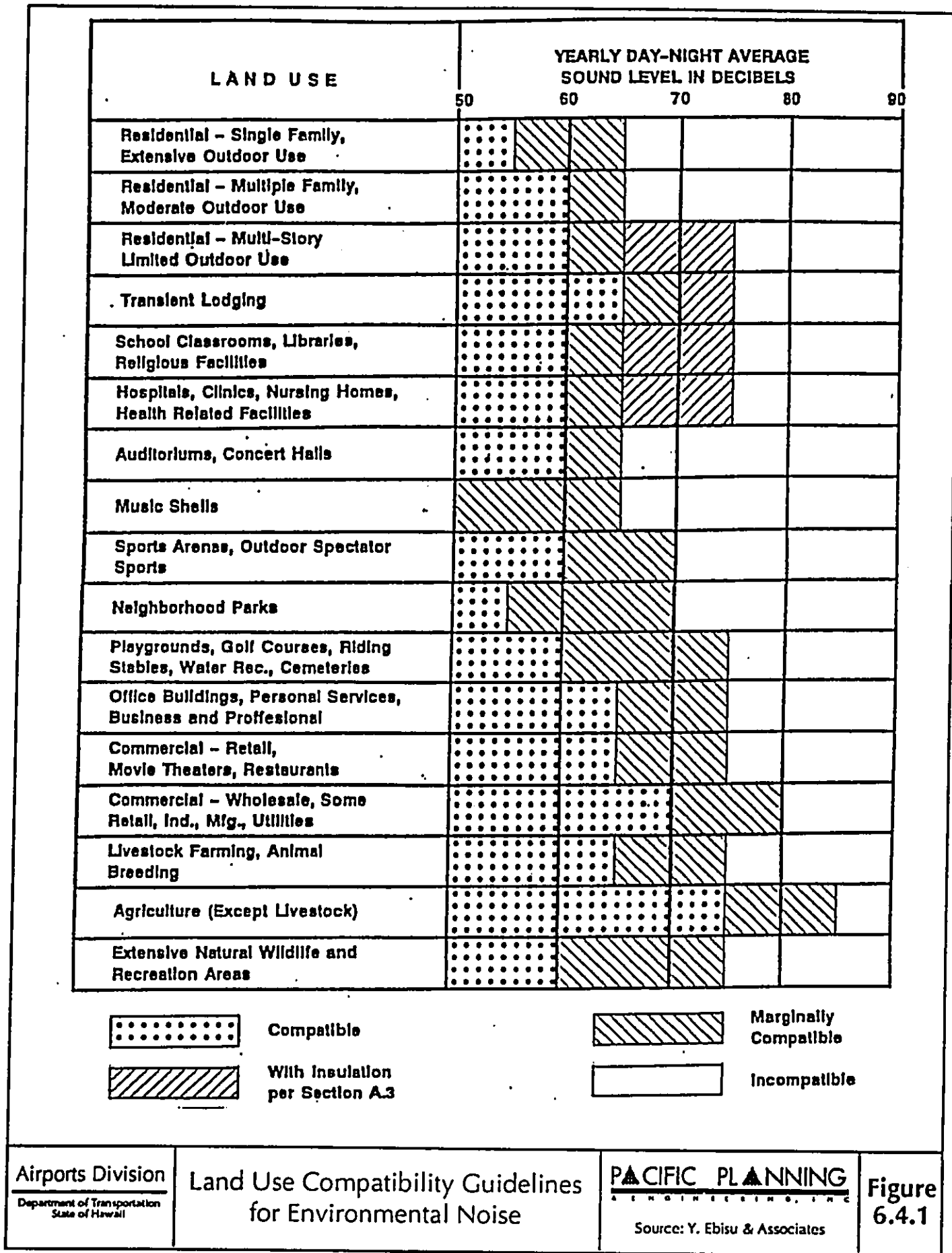
Vehicular, aircraft and short-term construction noise impacts are included. In addition, potential noise impacts associated with the possible transfer of all helicopter operations to the site of the old Puunene Airport is described. To set the stage for this discussion, the terms that are used to characterize environmental noise and the kinds of land uses that are compatible with different noise levels are presented briefly.

#### **6.4.1.1 Noise Descriptors and their Relationship to Land Use Compatibility**

The noise descriptor currently used by federal agencies to assess environmental noise is the Day-Night Average Sound Level (Ldn). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. By definition, the minimum averaging period for the Ldn descriptor is 24 hours. Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the Ldn descriptor.

Land use compatibility guidelines for various levels of environmental noise as measured by the Ldn descriptor system are shown on Figure 6.4.1. As a general rule, noise levels of 55 Ldn or less typically occur in rural areas, or in areas which are removed from high volume roadways. In urbanized areas which are shielded from high traffic volume streets, Ldn levels generally range from 55 to 65 Ldn, and are usually controlled by motor vehicle noise. Residences which front major roadways are generally exposed to levels of 65 Ldn, and as high as 75 Ldn when the roadway is a high speed freeway. Due to noise shielding effects from intervening structures, interior lots are usually exposed to 3 to 10 Ldn lower noise levels than lots fronting high volume traffic streets. For the purposes of determining noise acceptability for funding assistance from federal agencies (FAA, FHA/HUD, and VA), an exterior noise level of 65 Ldn or lower is considered acceptable. This standard is applied nationally, including Hawaii.

For aircraft noise, State DOT has recommended that 60 Ldn be used as the common level for determining land use compatibility with respect to noise sensitive uses near its airports. In addition, for those noise sensitive land uses which are exposed to aircraft noise greater than 55 Ldn, Section 31, Chapter 467, Hawaii Revised Statutes requires property owners to disclose aircraft noise levels to potential buyers prior to any real property transactions.





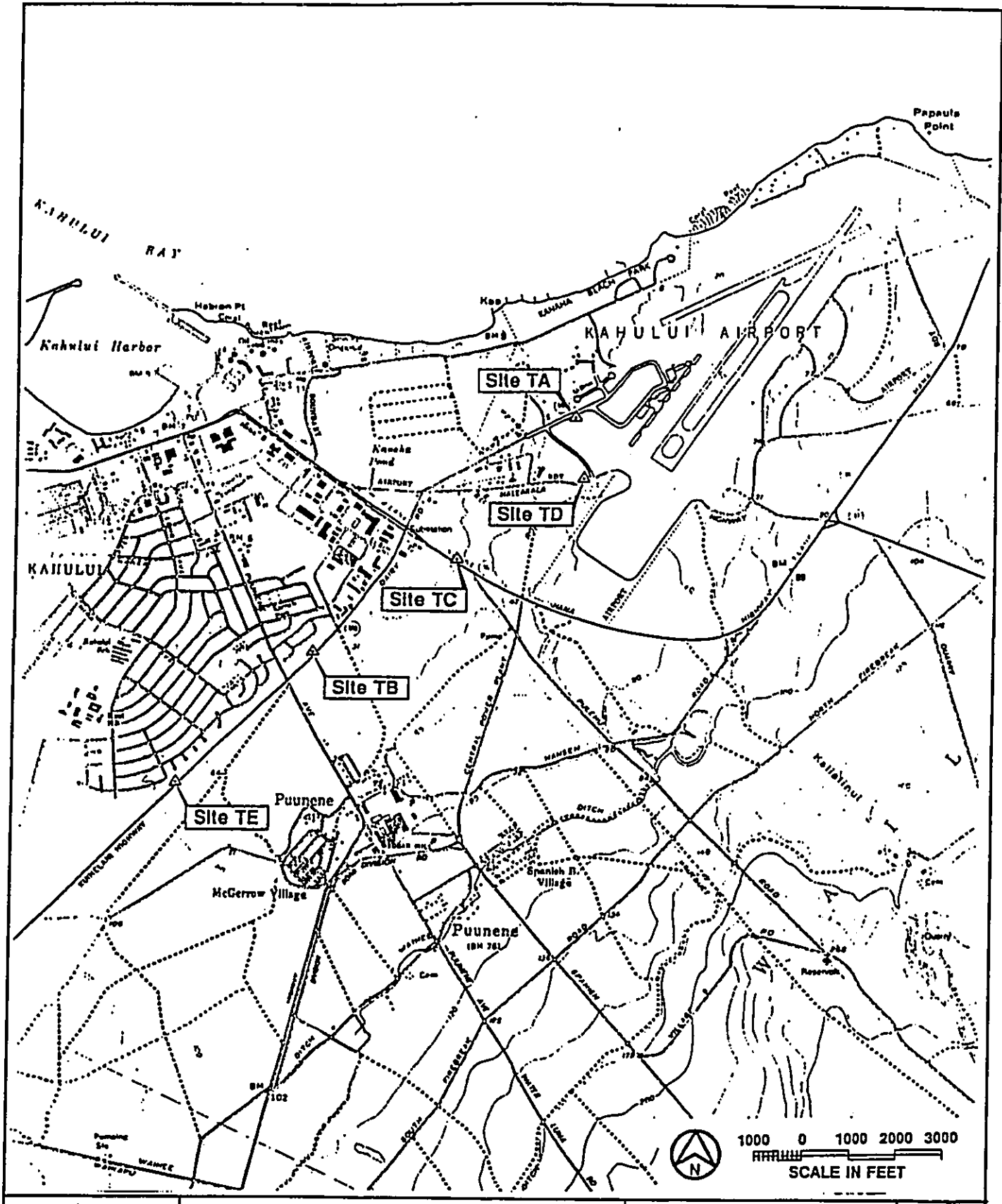
#### 6.4.1.2 Study Methodology

##### Noise Measurements

Existing vehicular noise levels were measured at four locations in the project environs to provide a basis for calculating the vehicular noise levels along the access roadways which service Kahului Airport: Keolani Place; Dairy Road; Hana Highway; and Haleakala Highway (Figure 6.4.2). Aircraft noise levels were measured at three noise monitoring sites in the Maalaea and Kihei areas (Figure 6.4.3). The noise measurements were performed during July, 1990 and April, 1991. The aircraft monitoring data at the three sites were used to supplement those previously measured and used for validating the aircraft noise contours developed during the FAR Part 150 Noise Compatibility Program for Kahului Airport (see Appendix F, Figures V-2 through V-4).

##### Vehicular Noise Analysis

Vehicular noise calculations for the existing conditions as well as noise predictions for the future conditions with and without the project were performed using the Federal Highway Administration (FHWA) Noise Prediction Model. Traffic data entered into the noise prediction model were: hourly traffic volumes, average vehicle speeds, estimates of traffic mix, and soft ground propagation loss factor.

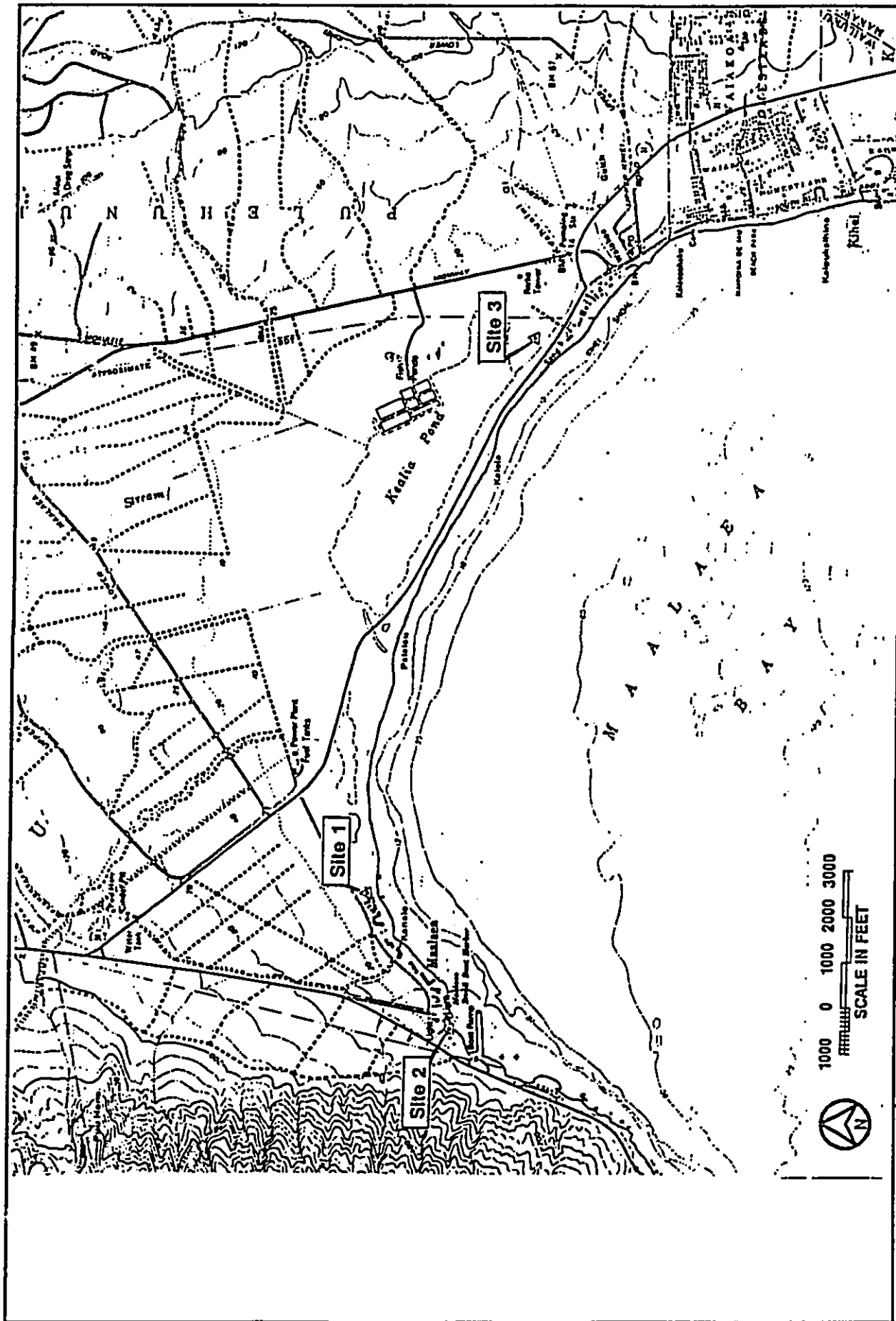


Airports Division  
 Department of Transportation  
 State of Hawaii

Location of Measurement Sites  
 Kahului Airport Noise Study

PACIFIC PLANNING  
 ENGINEERING, INC.  
 Source: Y. Ebisu & Associates

Figure  
 6.4.2



Airports Division  
 Department of Transportation  
 State of Hawaii

Location of Measurement Sites  
 Kahului Airport Noise Study

PACIFIC PLANNING  
 ENGINEERING INC  
 Source: Y. Ebisu & Associates

Figure  
 6.4.3

### Aircraft Noise Analysis

Aircraft noise measurements were obtained at Sites "1" through "3" which are located along the south shoreline of the island. These aircraft noise measurements were made to confirm the single event noise levels in the Maalaea and Kihei area were consistent with the noise contours for Kahului Airport which were previously developed during the FAR Part 150 Noise Compatibility Program. In addition, 1989 airline schedules, State DOT landing reports, and FAA enroute strips were also reviewed to update the data developed during the FAR Part 150 Noise Compatibility Study.

All airport noise contours were developed using the Federal Aviation Administration (FAA) Integrated Noise Model (INM), Version 3.9. The airport noise contours developed for 1989 were used to describe the existing aircraft noise levels in the Kahului Airport environs. Airport noise contours for the Proposed Action were also developed for 2010, and these contours were used to describe the future aircraft noise levels in the project environs.

The FAA criteria of a 1.5 Ldn increase in aircraft noise level at noise sensitive properties was used in defining noise impacts resulting from the Proposed Action. To be consistent with the State's FAR Part 150 Noise Compatibility Study and DOT's recommendations, the 60 Ldn contour was used to identify noise levels which were considered to be incompatible with noise sensitive land uses (dwellings, schools, day care centers, other public use facilities, hotels, etc.).

Because aircraft noise complaints occur from residents who are located outside the 60 and 55 Ldn contours, changes in single event noise levels during aircraft flyby events and changes in aircraft overflight patterns or frequencies at noise sensitive locations were also evaluated.

## 6.4.2 EXISTING CONDITIONS

### 6.4.2.1 Vehicular Noise

The existing vehicular noise levels along the roadways which service Kahului Airport and which are in the immediate vicinity of the Airport are in the "Significant Exposure, Normally Unacceptable" category and greater than 65 Ldn at 50 feet setback distance from the roadways' centerlines. These roadways include Keolani Place (Kahului Airport Road), Hana Highway, Dairy Road, and Kuihelani Highway. The locations of the existing 65 Ldn traffic noise contours range from 56 to 115 feet setback distances from the centerlines of the roadways examined.

Existing residences located along Dairy Road and Kuihelani Highway are within 40 to 85 feet from the centerlines of these roadways. Current vehicular noise levels at the residences which front Dairy Road and Kuihelani Highway may exceed 65 Ldn if they are not shielded by sound attenuating walls. Those residences which are located at greater than 115 feet setback distance from the roadways' centerlines or which are shielded by sound attenuating walls currently experience vehicular noise levels which are less than 65 Ldn.

Along Hana Highway toward Paia, vehicular noise levels are similar to those previously described along Dairy Road. Existing vehicular noise levels along both Dairy Road and Hana Highway are highest along the lots which front the roadways. At the interior lots, vehicular noise levels decrease to less than 65 Ldn due to their larger setback distances from the high volume roadways and the noise shielding effects of intervening structures between the high volume roadways and the interior lots. When there is less vehicle or aircraft traffic, the background ambient noise levels drop to a range of 45 to 50 dB, and can go below 45 dB during calm periods. The steady background ambient noise levels at these interior locations are controlled by distant traffic, birds, and foliage movement with the wind.

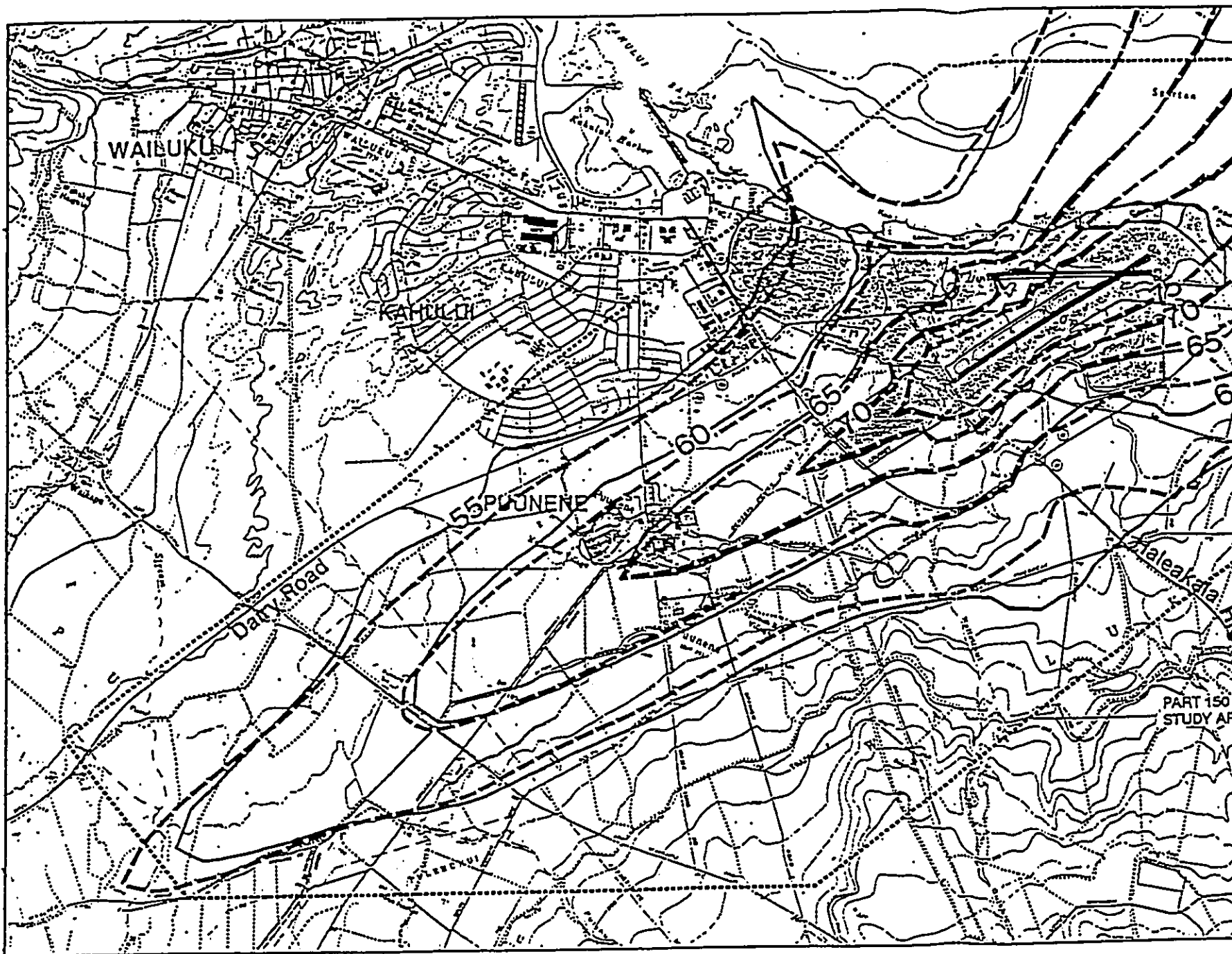
#### 6.4.2.2 Aircraft Noise

Aircraft noise sources in the project environs are associated with fixed and rotary wing aircraft operations at Kahului Airport. The most significant change in operations at Kahului Airport between 1987 and 1989 has been the FAA's re-routing of interisland jet aircraft arrivals from the Wailuku and Kahului areas to over the south shore of Maui. However, because the aircraft noise contours at Kahului Airport were controlled by jet aircraft departure (rather than approach) noise emissions, the change in jet approach traffic patterns at the Airport was not expected to change the FAR Part 150 Noise Compatibility Base Year Noise Exposure Map for Kahului Airport.

The size and extent of the aircraft noise contours in 1989 were similar to the FAR Part 150 Base Year Map. A graphical comparison of the two sets of noise contours is shown on Figure 6.4.4. As was the situation in 1987, the communities of Puunene, East Spreckelsville, and West Spreckelsville continue to be the primary noise sensitive receptor areas which are enclosed by the aircraft noise contours for Kahului Airport.

Table 6.4.1 summarizes the results of the aircraft noise measurements obtained at the three southern sites located under the primary approach corridors to Runway 2 at Kahului Airport. Maximum aircraft noise levels ( $L_{max}$ ) were typically between 62 and 72 dB at Sites #1 and #2, and typically less than 62 dB at Site #3. For the purposes of comparison, typical maximum noise levels of heavy trucks are in the order of 80 to 85 dB at 50 feet distance.

At noise sensitive locations within the 60 Ldn contour, specifically at Puunene and the Spreckelsville communities, typical maximum noise levels associated with aircraft flyby events are significantly higher than those at Sites #1 through #3. The maximum noise levels of jet aircraft departures from Runway 2 are typically greater than 80 dBA at East Spreckelsville and exceed 90 dBA at some locations in West Spreckelsville.



**INCOMPATIBLE LAND USES**

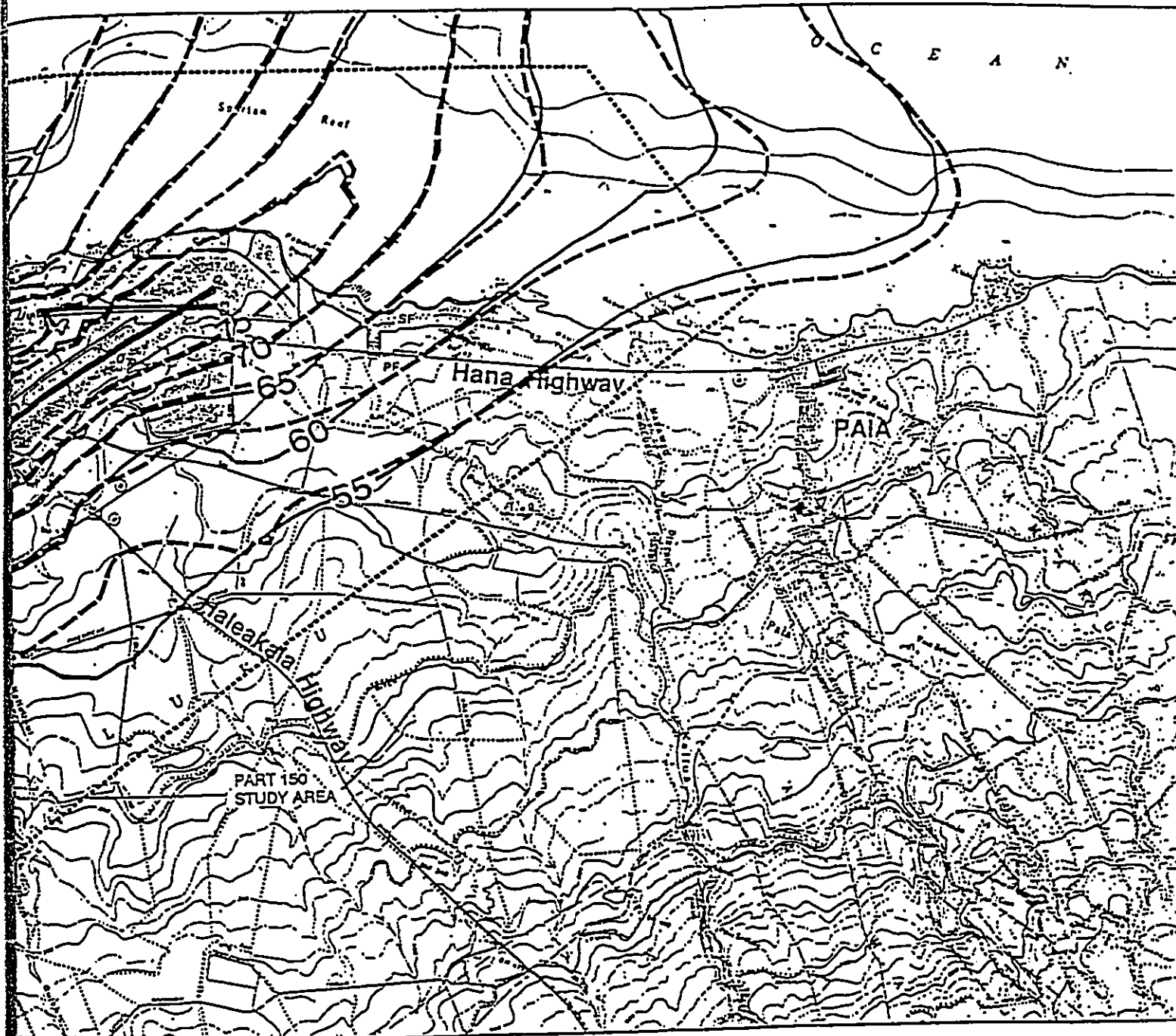
**RESIDENTIAL**  
 [SF] SINGLE FAMILY

**PUBLIC USE**  
 [S] SCHOOLS  
 [PF] PUBLIC FACILITIES (day care, libraries, community centers)  
 [C] CHURCH

----- PART 150 STUDY AREA BOUNDARY

— CY 1987 (PART 150 STUDY AREA) LDN CONTOUR

--- CY 1989 LDN CONTOUR



— CY 1987 (PART 150 STUDY  
BASE YEAR) LDN CONTOURS

- - - CY 1989 LDN CONTOURS

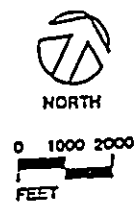


Figure 6.4.4.

COMPARISON OF CY  
1987 AND CY 1989  
NOISE EXPOSURE MAPS:  
KAHULUI AIRPORT



**Table 6.4.1**  
**Summary of Aircraft Noise Measurements for 3 Sites,**  
**Kahului Airport**

(MEASUREMENT SITE #1)

<u>AIRCRAFT TYPE</u>	<u>MAXIMUM SOUND LEVELS</u> <u>L<sub>max</sub> (in dB)</u>	<u>SOUND EXPOSURE LEVELS</u> <u>L<sub>se</sub> (in dB)</u>
B737	71.5; 78.2; 71.3; 71.5; 68.0; 66.8; 70.5	79.5; 83.9; 78.1; 78.0; 75.6; 73.0; 78.9
DC9	66.0; 71.0; 71.3; 67.0; 67.0; 69.1	73.0; 78.9; 77.5; 73.6; 77.0; 74.3
BAe-146	67.1	72.3
DHC-6	62.5	69.9
General Aviation	64.6; 59.8; 62.8; 66.9	71.0; 68.0; 69.6; 75.0
P-3	71.4; 72.8	79.8; 79.1
Helicopter	76.0; 59.9; 70.7	83.9; 67.9; 75.4
Ave. B737	71.1	79.3
Ave. DC9	68.6	76.3
Ave. BAe-146	67.1	72.3
Ave. DHC-6	62.5	69.9
Ave. General Aviation	63.5	71.7
Ave. P-3	72.1	79.5
Ave. Helicopter	68.7	79.8

Composite Aircraft Equivalent Sound Level (Leq) - 51.4 dB

Source: Y Ebisu and Associates

Table 6.4.1  
 Summary of Aircraft Noise Measurements for 3 Sites,  
 Kahului Airport

(MEASUREMENT SITE #2)

<u>AIRCRAFT TYPE</u>	<u>MAXIMUM SOUND LEVELS</u> <u>L<sub>max</sub> (in dB)</u>	<u>SOUND EXPOSURE LEVELS</u> <u>L<sub>se</sub> (in dB)</u>
B737	69.2; 63.8; 67.0; 71.4; 66.3; 71.0; 76.7	77.4; 71.4; 74.2; 78.2; 74.9; 78.1; 82.8
DC9	69.0; 59.9; 69.9; 67.3; 62.0	75.1; 67.1; 76.9; 74.2; 69.1
BAe-146	65.5	73.3
General Aviation	64.2	70.9
C130	67.0	73.1
Ave. B737	69.3	78.1
Ave. DC9	65.5	73.8
Ave. BAE-146	65.5	73.3
Ave. General Aviation	64.2	70.9
Ave. C130	67.0	73.1

Composite Aircraft Equivalent Sound Level (Leq) - 49.0 dB

Source: Y Ebisu and Associates

Table 6.4.1  
Summary of Aircraft Noise Measurements for 3 Sites,  
Kahului Airport

(MEASUREMENT SITE #3)

<u>AIRCRAFT TYPE</u>	<u>MAXIMUM SOUND LEVELS</u> <u>L<sub>max</sub> (in dB)</u>	<u>SOUND EXPOSURE LEVELS</u> <u>L<sub>se</sub> (in dB)</u>
B737	59.7; 52.0; 66.0; 60.2	65.4; 58.0; 72.9; 65.9
DC9	56.6	64.7
General Aviation	59.0; 56.0; 57.0	66.2; 63.2; 64.3
DC10	61.0	68.5
Ave. B737	59.5	67.4
Ave. DC9	56.6	64.7
Ave. General Aviation	57.3	64.7
Ave. DC10	61.0	68.5

Composite Aircraft Equivalent Sound Level (Leq) - 36.1 dB

The following aircraft operations were not measured because aircraft noise level was less than ambient noise level.

DC10	<50
L1011	<51
B737(200)	<50; <45; <52; <50; <46; <45; <50; <45; <52
DC9	<48; <55; <45; <52
BAe146	<45; <50; <44; <50
DHC6	<45
General Aviation	<51
P-3	<48; <50
Helicopter	<53; <50; <46

Source: Y Ebisu and Associates

For the purposes of the FAR Part 150 Noise Compatibility Program, noise sensitive land uses within the 60 Ldn contour are considered to be exposed to incompatible levels of aircraft noise. The degree of adverse health and welfare impacts resulting from aircraft noise depends upon the sound attenuation properties of the structures containing the noise sensitive uses. For the purposes of this study, it was assumed that all noise sensitive properties can be considered to be adversely impacted by aircraft noise if they are located within the 60 Ldn aircraft noise contour and if they are not specially treated to reduce interior noise levels to 45 Ldn or less. Total closure and air conditioning is generally required for structures located within the 60 Ldn contour in order to achieve the 45 Ldn interior noise criteria.

The existing aircraft noise levels at Kahului Airport are incompatible with the noise sensitive land uses in Puunene, East Spreckelsville, and West Spreckelsville. Based on forecasts of aircraft operations at Kahului Airport, significant reductions in the aircraft noise contours are not likely in the intermediate or long term. In order to correct this situation, mitigation of aircraft noise impacts under the FAR Part 150 Noise Compatibility Program for Kahului Airport has been recommended for public use facilities in Puunene and East Spreckelsville, and for single and multi-family residences in East and West Spreckelsville which are located within the 60 Ldn contour of the FAR Part 150 Noise Compatibility Exposure Map.

Quieter aircraft flight patterns, curfews and Stage 3 aircraft as potential measures for improving the land use compatibility at Kahului Airport were studied within the FAR Part 150 Noise Compatibility Program. There are no quieter aircraft flight patterns which have the potential for significantly reducing the airport noise contours. The relative costs of forced conversion to Stage 3 aircraft were determined to be significantly higher than the costs of the recommended measures of sound attenuation of buildings and relocation.

Noise mitigation measures under consideration by DOT include the following:

1. Provide sound attenuation treatment to all public use facilities which are exposed to noise levels within the 60 Ldn contour.
2. Provide relocation assistance via a real estate acquisition program for those residents who are located within the 60 Ldn contour.
3. A preferential runway use system which would establish a curfew on Runway 5-23 operations during the night, minimize landings on Runway 23, and minimize aircraft overflights of Spreckelsville.
4. A study of the potential benefits of selecting statistically quieter Stage 3 engines for the nighttime cargo jet aircraft.
5. The installation of an airport noise monitoring system at Kahului Airport.
6. For those residents who do not choose to participate in the relocation assistance program, provide sound attenuation treatment to those dwellings which are located within the 60 Ldn contour. Grants of avigation and noise easements from the homeowner to DOT would be required in exchange for these sound attenuation treatments.

The following are the comparative cost estimates developed for the FAR Part 150 Noise Compatibility Program at Kahului Airport: replacement of old aircraft with new Stage 3 aircraft - \$500 million; re-engining old aircraft to meet Stage 3 limits - \$60 million; sound attenuation treatment of all homes and public use structures within the 5-year 60 Ldn contour - \$5.9 million; and purchase of all noise sensitive properties in Spreckelsville within the 5-year 60 Ldn contour - \$50 million.

The purpose of the FAR Part 150 Noise Compatibility Program is to improve land use compatibility around the Airport. Additional changes in the noise compatibility situation can be expected beyond the 5-year time horizon of the FAR Part 150 Program, particularly if significant changes in aircraft operations or airport facilities occur. Those additional noise impacts which may occur by 2010 assume that the land use incompatibilities which currently exist and which are forecast to exist in 1992 will have been addressed and corrected under the present FAR Part 150 Noise Compatibility Study.

In response to noise litigation, DOT retained KPMG Peat Marwick (KPMG) to provide an impartial, unbiased identification of potential noise abatement measures and to prepare a cost/benefit analysis of the alternatives. KPMG's report entitled Cost/Benefit Analysis Related To Alternative Noise Restrictions - Kahului Airport, dated March 1992, identified noise abatement and noise mitigation alternatives that could be implemented to resolve the nighttime air cargo noise issue at the Airport. Based on their analysis, they determined the use of Stage 3 aircraft for nighttime air cargo operations would address the issue of noise from cargo operations without placing undue burden on the airlines or local businesses.

#### 6.4.3 PROBABLE VEHICULAR NOISE IMPACTS

##### 6.4.3.1 No-Action Alternative

###### Base No-Action Scenario

Currently, vehicular noise levels along the residential property lines fronting Kuihelani Highway and Dairy Road exceed the FHA/HUD criteria of 65 Ldn. Future vehicular noise levels are expected to be high in the residential areas fronting Kuihelani Highway and the sections of Dairy Road near Puunene Avenue regardless of whether or not the Proposed Action is implemented.

As discussed in Section 8.1, large increases in vehicular volumes are expected to occur along Kuihelani Highway, and continue along Dairy Road and Keolani Place toward the direction of the Airport. The increase in vehicular noise levels along this primary corridor to the Airport was predicted to be approximately 4.6 dB. Vehicular noise levels along roadways east of the Airport (Hana Highway northeast of Kala Road and Haleakala Highway east of Hana Highway) are not expected to change significantly. To the west of the Hana Highway and Haleakala Highway intersection near Hanakai Street, the future vehicular noise levels along Hana Highway are expected to increase by 0.8 dB which are considered to be too small to detectable by the human ear.

The 65 Ldn for traffic noise contour is predicted to increase from approximately 100 feet to 219 feet from the centerline of Kuihelani Highway and the short section of Dairy Road north of Puunene Avenue which connects Kuihelani Highway with the Airport Access Road by 2010. Along the north section of Dairy Road between the proposed Airport Access Road and Hana Highway, setback distances to the 65 Ldn contour are expected to increase significantly (from 115 feet to 234 feet).

#### Constrained No-Action Scenario

Under the Constrained No-Action Scenario, vehicular noise levels would be 0.0 to 0.4 Ldn lower than under the Base No Action Scenario. This is due to the slightly lower passenger volumes that would occur. The largest change (-0.4 Ldn) in traffic noise levels occurred along Keolani Place, which is not considered to be a noise sensitive roadway. The noise level changes along the other roadways ranged from 0.0 to 0.1 Ldn, which are considered to be insignificant. Thus, the vehicular noise levels for the Constrained No Action Scenario are basically the same as the Base No-Action Scenario.

#### 6.4.3.2 Proposed Action

Since the vehicular noise levels for the Base No-Action Scenario are basically the same as the Constrained No Action Scenario, the probable vehicular noise impacts of the Proposed Action would be the same under both No-Action Scenarios. As mentioned previously, future vehicular noise levels are expected to be high in the residential areas fronting Kuihelani Highway and the sections of Dairy Road near Puunene Avenue regardless of whether or not the Proposed Action is implemented at Kahului Airport.

Vehicular noise levels on Kuihelani Highway are predicted to increase by an additional 0.4 to 0.5 dB, but noise levels along Dairy Road and Keolani Place are expected to decline by 1.5 to 3.9 dB due to the transfer of airport traffic to the new Airport Access Road. Noise levels along roadways east of the Airport (Hana Highway northeast of Kala Road and Haleakala Highway east of Hana Highway) are not expected to change significantly. To the west of the Hana Highway and Haleakala Highway intersection near Hanakai Street, the future vehicular noise levels along Hana Highway are expected to increase similar to the No-Action Scenarios - 0.8 dB, which are considered to be too small to detectable by the human ear.

The setback distance to the 65 Ldn contour is predicted to increase similar to the No-Action Scenarios from approximately 100 feet to 219 feet from the centerline of Kuihelani Highway by 2010. Similar conclusions apply to the short section of Dairy Road north of Puunene Avenue, which connects Kuihelani Highway with the new Airport Access Road. Along the north section of Dairy Road between the Airport Access Road and Hana Highway, setback distances to the 65 Ldn contour are expected to decrease slightly (from 115 feet to 109 feet).

Along the new Airport Access Road, vehicular noise levels are expected to be similar and possibly higher than those predicted along Kuihelani Highway. Setback distances to the 65 Ldn vehicular noise contour along the Airport Access Road are also expected to be similar and possibly greater than those predicted along Kuihelani Highway.



## 6.4.4 PROBABLE AIRCRAFT NOISE IMPACTS

### 6.4.4.1 General

Predictions of near term (1992) aircraft noise levels in the project environs were developed and reported in Volume 1 of the FAR Part 150 Noise Compatibility Study for Kahului Airport. The 1992 contours are consistent with the existing 1989 noise contours, and do not appear to be out of date. Forecast land use incompatibilities located within the 60 Ldn contour reported in the FAR Part 150 Noise Compatibility Study include the following areas:

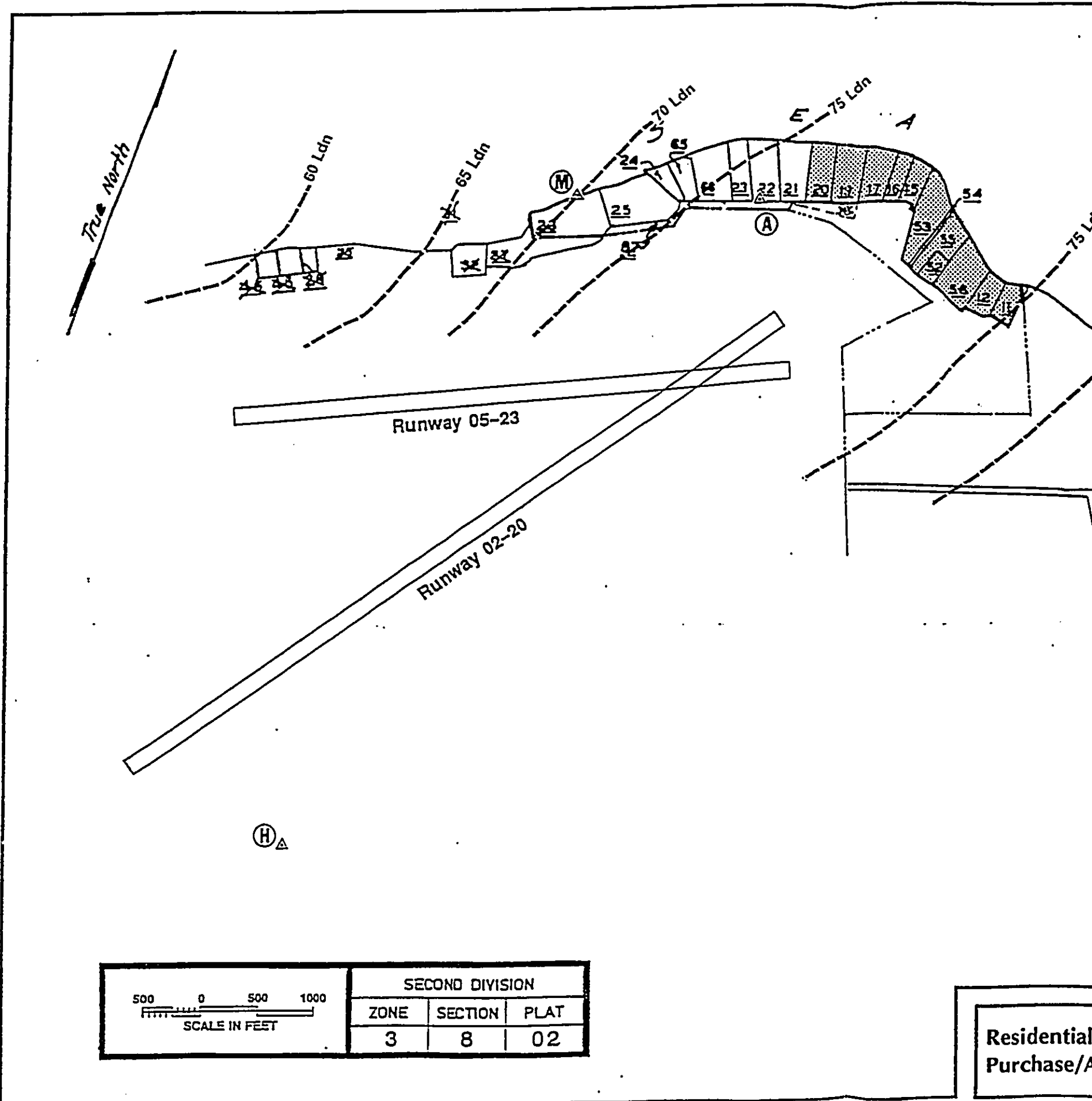
- Entire residential area of West Spreckelsville.
- Major portion of the residential areas in East Spreckelsville.
- Two buildings at the Kaunoa Senior Center in East Spreckelsville.
- Three classroom buildings and a church in Puunene.

The locations of the residential lots in West and East Spreckelsville recommended for inclusion in the FAR Part 150 Noise Compatibility home purchase or sound attenuation program are shown on Figure 6.4.5. This discussion assumes that the land use incompatibilities identified by the FAR Part 150 Noise Compatibility Study will be corrected in the future, and not later than 2010.

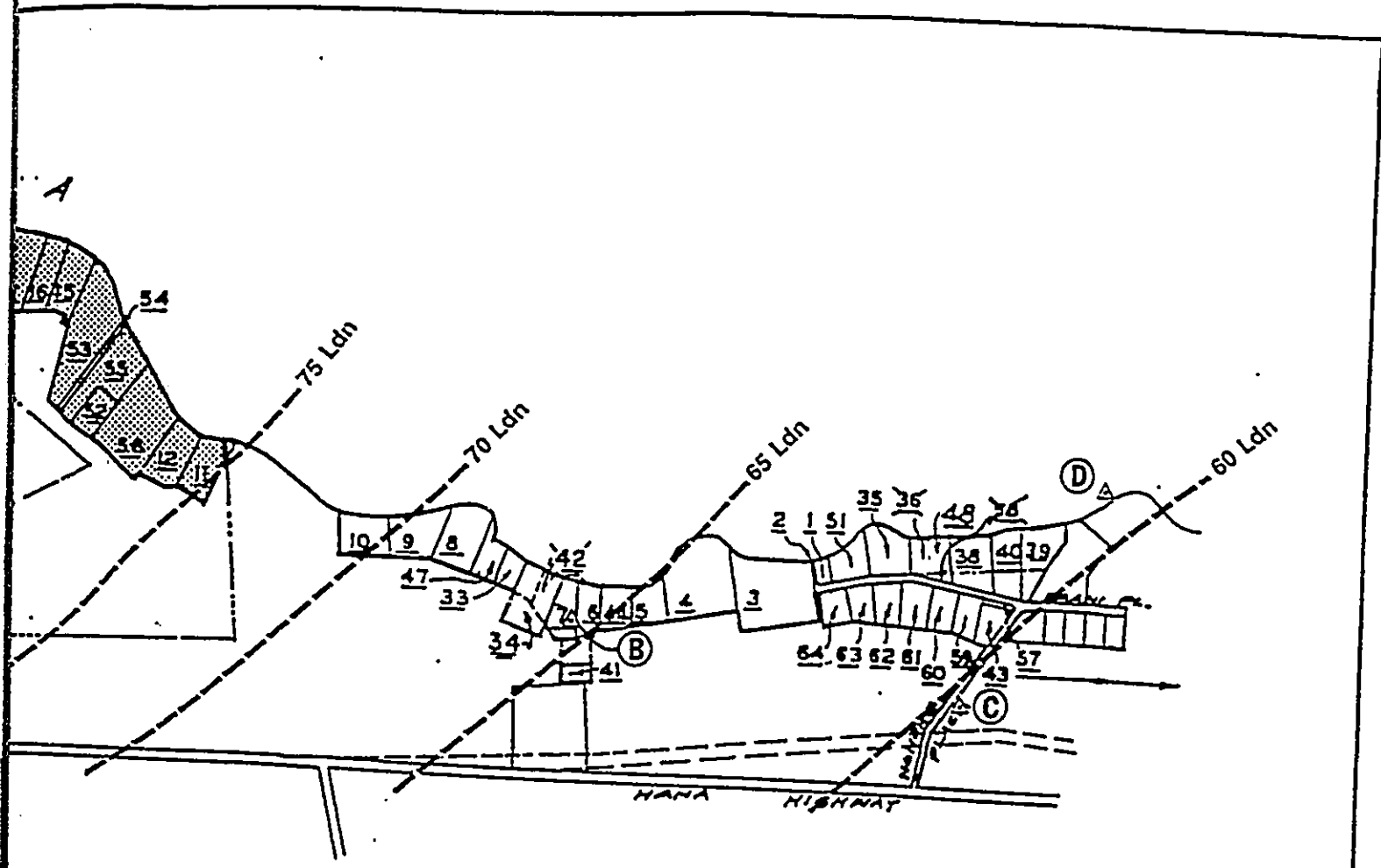
### 6.4.4.2 No-Action Alternative

#### Base No-Action Scenario

Aircraft noise levels are expected to decline by 1.0 to 2.5 Ldn from existing (1989) noise levels at noise sensitive areas around Kahului Airport. The primary reason for this decline in aircraft noise levels is the conversion of 80 percent of the total interisland jet aircraft fleet from the noisier Stage 2 [e.g. B-737 (200) and DC-9 (15/50)] models to the quieter Stage 3 [e.g. BAe-146, B-737 (300) and DC-9 (80)] models.



Source: Y. Ebisu & Associates



**KEY:**

- Ⓩ Δ Noise Monitoring Locations
- Ldn Contours
- ▨ Parcels Are Part Of Kahului Airport

**Residential Lots Recommended for Inclusion in FAR Part 150 Purchase/Attenuation Program**

**Figure 6.4.5**

Because the forecast 2010 noise levels are lower than the existing and FAR Part 150 Noise Compatibility Study levels, it was concluded that aircraft noise mitigation measures beyond those needed to correct existing incompatibilities would not be required by 2010.

#### Constrained No-Action Scenario

The aircraft noise contours associated with the Constrained No-Action Scenario are shown in the Figure 6.4.6. Under the Constrained No Action Scenario, aircraft noise levels would be 0.2 to 0.4 Ldn lower than under the Base No Action Scenario, which are not considered to be significant. Thus, the aircraft noise levels for the Constrained No Action Scenario are basically the same as the Base No-Action Scenario.

#### 6.4.4.3 Proposed Action

Since the aircraft noise levels for the Base No-Action Scenario are basically the same as the Constrained No Action Scenario, the probable aircraft noise impacts of the Proposed Action would be essentially the same for both No-Action Alternatives.

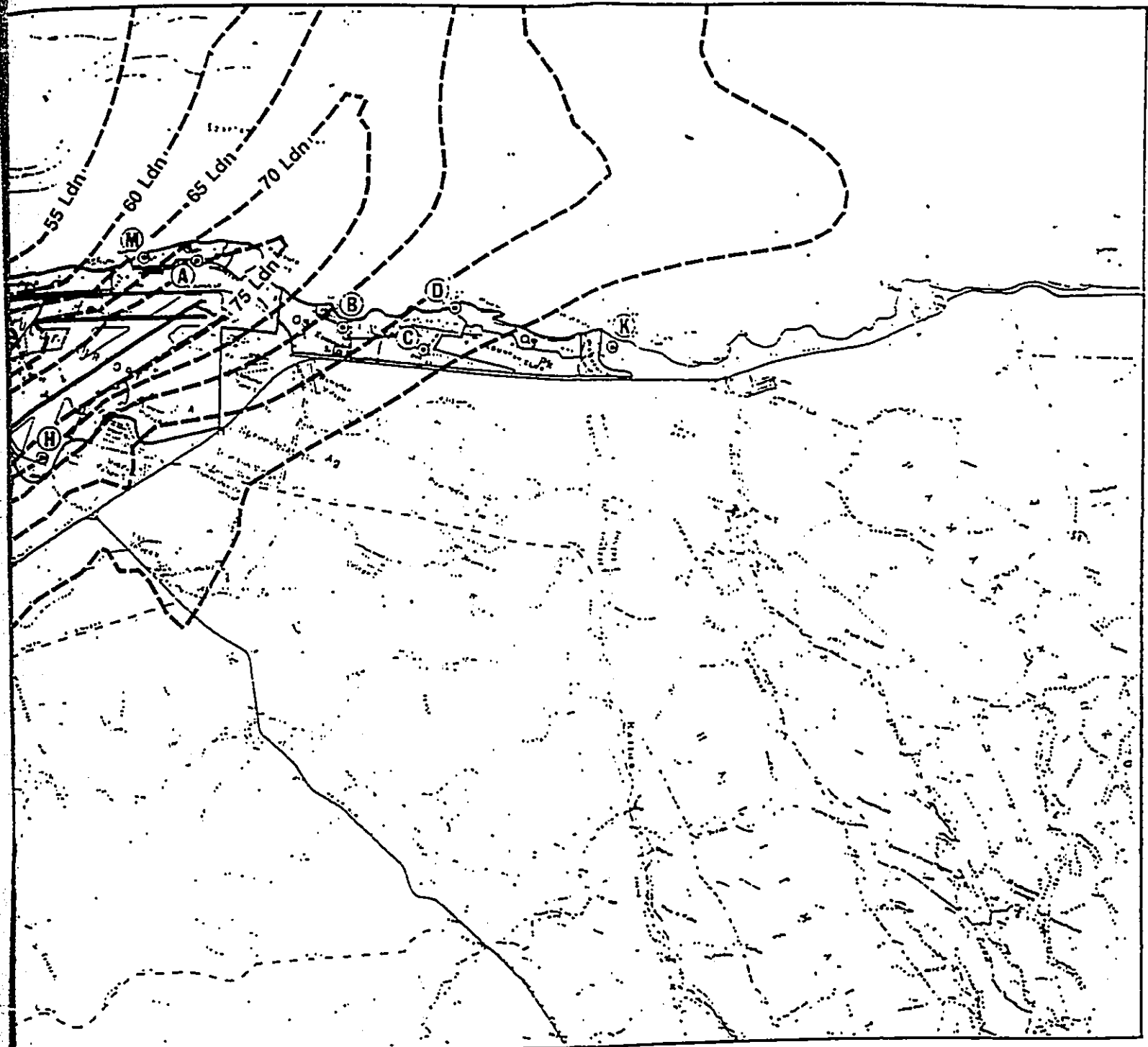
Puunene is the only area where extension of existing Runway 2-20 to 9,600 will increase aircraft noise levels by as much as 1.5 to 1.6 Ldn, which are equal to or greater than the FAA criteria of 1.5 Ldn for analysis of significant noise impacts. At all other noise sensitive locations in the Airport environs, increases in aircraft noise levels are expected to be less than 1.5 Ldn when compared to the No-Action Alternatives. It was concluded that extension of the existing Runway 2-20 to 9,600 feet will not cause adverse noise impacts as long as the FAR Part 150 Noise Compatibility Program under consideration is implemented.



**MAUI COMMUNITY PLAN LEGEND:**

<table border="0"> <tr><td><b>AG</b></td><td>Agriculture</td></tr> <tr><td><b>R</b></td><td>Rural</td></tr> <tr><td><b>SF</b></td><td>Single Family Residential</td></tr> <tr><td><b>MF</b></td><td>Multi-Family Residential</td></tr> <tr><td><b>B</b></td><td>Business/Commercial</td></tr> </table>	<b>AG</b>	Agriculture	<b>R</b>	Rural	<b>SF</b>	Single Family Residential	<b>MF</b>	Multi-Family Residential	<b>B</b>	Business/Commercial	<table border="0"> <tr><td><b>BR</b></td><td>Business/Multi-Family</td></tr> <tr><td><b>BI</b></td><td>Business/Industrial</td></tr> <tr><td><b>LI</b></td><td>Light Industrial</td></tr> <tr><td><b>HI</b></td><td>Heavy Industrial</td></tr> <tr><td><b>H</b></td><td>Hotel</td></tr> </table>	<b>BR</b>	Business/Multi-Family	<b>BI</b>	Business/Industrial	<b>LI</b>	Light Industrial	<b>HI</b>	Heavy Industrial	<b>H</b>	Hotel	<table border="0"> <tr><td><b>P</b></td><td>Public/Quasi-Public</td></tr> <tr><td><b>PK</b></td><td>Park</td></tr> <tr><td><b>OS</b></td><td>Open Space</td></tr> <tr><td><b>PD</b></td><td>Project District</td></tr> <tr><td><b>A</b></td><td>Airport</td></tr> </table>	<b>P</b>	Public/Quasi-Public	<b>PK</b>	Park	<b>OS</b>	Open Space	<b>PD</b>	Project District	<b>A</b>	Airport
<b>AG</b>	Agriculture																															
<b>R</b>	Rural																															
<b>SF</b>	Single Family Residential																															
<b>MF</b>	Multi-Family Residential																															
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<b>BI</b>	Business/Industrial																															
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<b>PK</b>	Park																															
<b>OS</b>	Open Space																															
<b>PD</b>	Project District																															
<b>A</b>	Airport																															

Z ⊙ PART 150 STUDY NO. MONITORING SITE  
 LDN CONTOURS



○ PART 150 STUDY NOISE MONITORING SITES

--- LDN CONTOURS



NORTH

0 1000 2000  
FEET

**Fig. 6.4.6**

CY 2010  
NOISE EXPOSURE MAP  
(ALTERNATIVE A -  
CONSTRAINED NO ACTION)

Extension of existing Runway 2L-20R to the southwest should allow for reduction of taxi and start-to-roll noise during Kona departures, particularly for the more frequent and noisier interisland, Stage 2 jet aircraft. The additional runway length to the southwest could enable the start-to-roll point to be moved further southwest away from the end of the runway for some aircraft if approved which should result in a displacement of the Kona departure noise away from West Spreckelsville.

As shown on Figure 6.4.7, the noise levels depicted by the contours and noise monitoring site calculations for the 8,500 foot parallel runway will be approximately 0.6 Ldn higher than the No-Action Alternatives due to the greater number of air carrier operations forecast.

The 8,500 parallel Runway 2R-20L will result in increased noise levels over the Puunene school and church buildings due to the relocation of the trade wind arrival and Kona departure flight tracks by 2,500 feet toward the east. Increased noise levels of as much as 7 Ldn (above the 58 Ldn under the No-Action Alternatives) are expected to occur over the Puunene public use facilities. In addition, frequent overflights of the Puunene public use facilities will occur with use of the parallel runway by jet and propeller aircraft. No significant increases in aircraft noise levels at monitoring sites B, C and D are expected for the 8,500 foot parallel runway.

Additional calculations which disregarded the FAA INM's assumptions of reduced rearward noise during Kona departures due to source directivity effects were performed to obtain a more accurate estimate of changes in noise levels in the East Spreckelsville area west of Sites C and D. The 8,500 foot parallel runway is expected to increase noise levels 1.5 Ldn above the No-Action Alternatives at the Kaunoa Senior Center, but less than 1.5 Ldn in other areas of East Spreckelsville.



**MAUI COMMUNITY PLAN LEGEND:**

- AG Agriculture
- R Rural
- SF Single Family Residential
- MF Multi-Family Residential
- B Business/Commercial

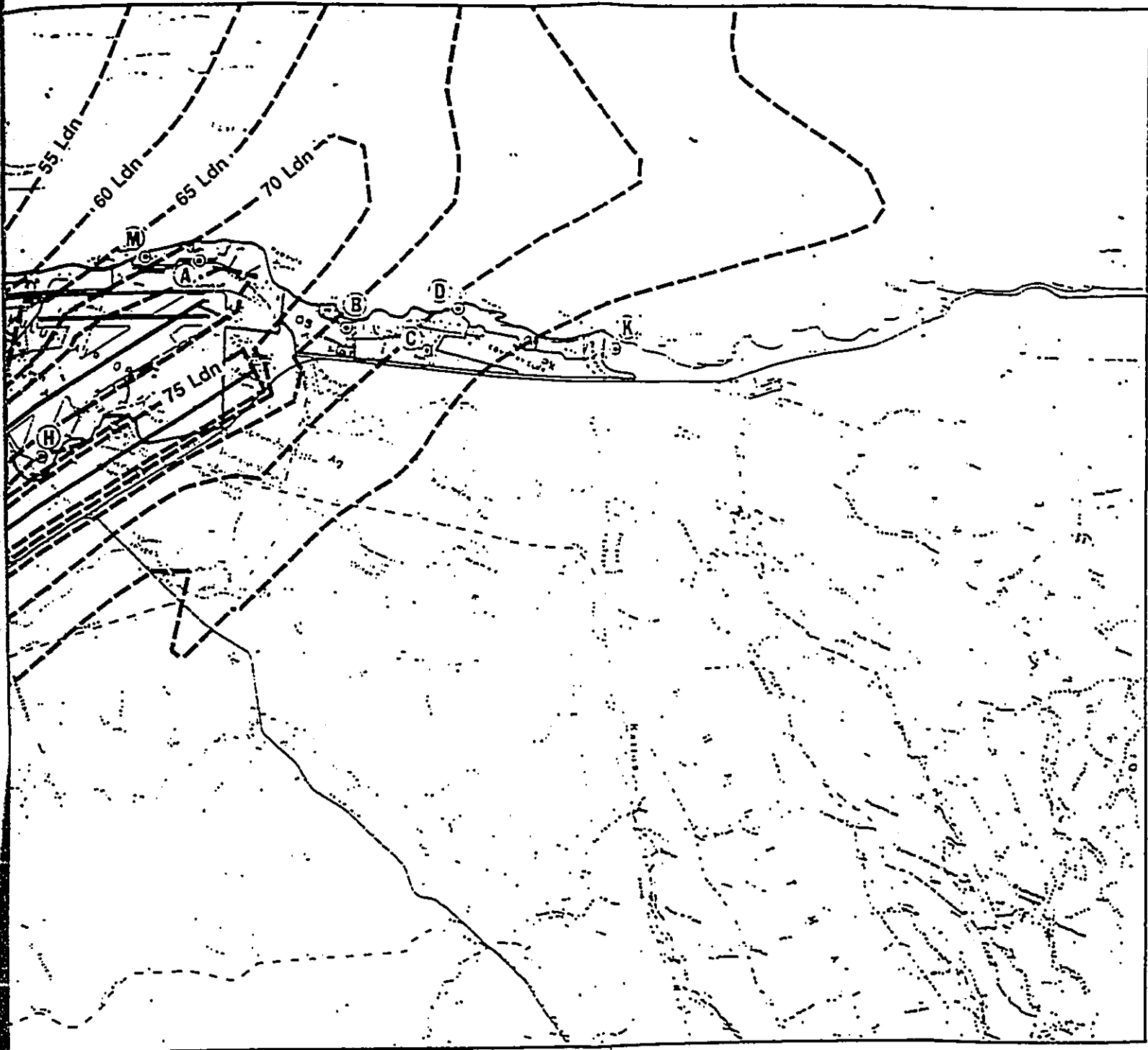
- BR Business/Multi-Family
- BI Business/Industrial
- LI Light Industrial
- HI Heavy Industrial
- H Hotel

- P Public/Quasi-Public
- PK Park
- OS Open Space
- PD Project District
- A Airport

Z O PART 150 STUDY NOISE MONITORING SITES

--- LDN CONTOURS





① PART 150 STUDY NOISE MONITORING SITES

--- LDN CONTOURS

A north arrow pointing upwards and a scale bar below it, marked with 0, 1000, and 2000 feet.

**Fig. 6.4.7**  
CY 2010 NOISE EXPOSURE MAP  
(ALTERNATIVE C - 9,600 FT  
EXISTING RUNWAY 02L-20R  
AND 8,500 FT PARALLEL  
RUNWAY 02R-20L, WITHOUT  
TOUR HELICOPTER OPERATIONS)

#### 6.4.5 OTHER NOISE IMPACTS

##### Noise from Other On-Site Airport Facilities

Noise from other on-site facilities at Kahului Airport are primarily associated with mechanical equipment such as air conditioning and refrigeration condensers and chillers, blowers, emergency generator equipment, and ground transportation vehicles. Because the existing and planned airport facilities are located at relatively large (500+ feet) distances from noise sensitive areas, adverse noise impacts from these on-site facilities are not anticipated. Additionally, if airport equipment or facilities need to be located near noise sensitive properties, sound attenuation treatment can be applied to the airport equipment or facilities to minimize the possible adverse noise impacts from these units.

##### Construction Noise

Audible construction noise will probably be unavoidable during the entire airport construction period. The total time period for construction is unknown, but it is anticipated that the actual work will be moving from one location on the Airport site to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the entire project.

The noise sensitive properties which are predicted to experience the highest noise levels during construction activities on the Airport site are the existing residences at East and West Spreckelsville. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the various construction sites.

## 6.4.6 POTENTIAL MITIGATION MEASURES

### 6.4.6.1 Vehicular Noise

Currently, vehicular noise levels along the residential property lines fronting Kuihelani Highway and Dairy Road exceed the FHA/HUD criteria of 65 Ldn. With the forecast growth in traffic along these two roadways by 2010, vehicular noise levels are expected to increase by 5.1 Ldn, which would raise vehicular noise levels above 70 Ldn at the residential property lines fronting the roadways. This degree of increase in vehicular noise levels is considered to be significant for those areas south of the Dairy Road/Airport Access Road intersection. The Airport Access Road will divert traffic from the north section of Dairy Road and improve conditions for residences along Dairy Road which are north of the Dairy Road/Airport Access Road intersection.

Because vehicular noise along public roadways is generated by non-project as well as project-related traffic, mitigation of off-site vehicular noise impacts are generally performed by individual property owners fronting the roadways' right-of-way or by public agencies during roadway improvement projects. These mitigation measures generally take the form of increased setbacks, sound attenuating walls, total closure and air conditioning, or the use of sound attenuating windows. If Dairy Road and/or Kuihelani Highway, require improvements (e.g. widening), the improvements should be toward the southeast and away from existing residences. Where adequate setbacks beyond the 65 Ldn noise contour are not available, the construction of 6 foot high sound walls can be effective for attenuating vehicular noise for single story structures or the ground floors of multi-story structures. Whenever mitigation of vehicular noise for upper floors is required, the use of closure and air conditioning, or the use of sound attenuating windows are appropriate sound attenuation measures.

#### 6.4.6.2 Aircraft Noise

The increase in noise levels at both Puunene and East Spreckelsville may be mitigated by increasing sound attenuation treatments in the form of closure and air conditioning of the structures. For East Spreckelsville residences located within the parallel runway protection zone, relocation rather than sound attenuation treatment may be the more likely result.

In addition, the adoption of an Informal Preferential Runway Use Program, which designates Runways 2L, 20R, and 20L as the primary runways for departures by large propeller or jet aircraft and which designates Runways 2L, 2R, and 20R as the primary runways for landings by large propeller or jet aircraft, is recommended following construction of the parallel runway.

The recommended aircraft noise mitigation measures listed previously are expected to be additional measures beyond those currently being considered within the FAR Part 150 Noise Compatibility Program for Kahului Airport. One goal of the FAR Part 150 Program is to improve the existing incompatible land use situation at Kahului Airport, and in particular, in the East and West Spreckelsville areas. If this goal is accomplished, additional noise mitigation measures should not be required to improve upon the existing incompatible land use situation at the Airport. Measures involving relocation assistance and/or sound attenuation treatment of residences and public use structures are recommended for inclusion in the Part 150 Program, primarily due to the existing land use incompatibilities in the Spreckelsville areas, and due to the difficulties and generally higher costs associated with achieving compatible land uses by other means.

#### 6.4.6.3 Construction

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 feet distance), and due to the exterior nature of the work (grading and earth moving, trenching, concrete pouring, hammering, etc.). The use of properly muffled construction equipment should be required on the job sites. The incorporation of State Department of Health construction noise guidelines which are applicable to the island of Oahu is another noise mitigation measure which can be applied to this project. Noisy construction activities are not allowed on holidays under the DOH permit procedures.

## 6.5 CLIMATE, METEOROLOGY AND AIR QUALITY

The potential air quality impacts of the various alternatives were evaluated by Woodward-Clyde Consultants, Inc. The objectives of the study were to determine the probable air quality impacts of the Proposed Action, and if any violations of State or Federal air quality standards would occur. Their analyses are summarized below and presented in their entirety in Appendix G, indicates that the Proposed Action would not result in any violations of the Hawaii or National Ambient Air Quality Standards

### 6.5.1 EXISTING CONDITIONS

#### 6.5.1.1 Climate and Meteorology

The major climatic features influencing the Kahului area include the buffering effect of the Pacific Ocean, the constant level of solar energy and the semi-permanent high pressure cell centered north of the Hawaiian islands. These features produce consistent year-round temperatures, pronounced seasonal variations in rainfall, a rarity of severe storms, and regular winds from the northeast.

Average monthly temperatures (°F) are in the 70's throughout the year. The temperature variation between the coldest month, February, and the warmest month, August, is slightly greater than 7 degrees. The Pacific Ocean and the constant level of solar heating contribute to the uniform temperatures at Kahului.

Over 80 percent of the annual rainfall (19 inches) occurs during the six month wet season, November through April. The months of December, January and February constitute the heart of the wet season. June is the driest month (average rainfall of 0.2 inches) of the dry season. Occasionally, a month during the dry season passes with no measurable amount of precipitation.

Calm conditions are rare at Kahului Airport and occur primarily at night. Short, light showers constitute the greatest number of rainfall occurrences. Severe storm systems are rare. However, an occasional severe weather system may display thunderstorms, damaging winds, and torrential rains.

Kahului experiences surface winds predominantly from the northeast. These winds, can attain speeds of 40 to 45 mph at the Airport and result from the funneling effect of the surrounding mountains and the air circulation pattern established by the semi-permanent high pressure system over the region. This pressure system produces regular air flows from the northeast, known as the Northeast Trades, which are most prevalent during summer months.

#### 6.5.1.2 Monitoring Stations

Kahului Airport is located within the State of Hawaii Air Quality Control Region. The control region is an attainment area for nitrogen dioxide ( $\text{NO}_2$ ), carbon monoxide (CO), sulfur dioxide ( $\text{SO}_2$ ), ozone ( $\text{O}_3$ ), particulate matter and lead. Ambient concentrations of these criteria pollutants are below the corresponding State and Federal ambient air quality standards presented in Table 6.5.1.

The nearest stations monitoring ambient air quality are located in Kahului, Maui for particulate matter, sulfur dioxide and nitrogen dioxide; at Sand Island, Oahu, for ozone, and at Honolulu, Oahu, for carbon monoxide. Monitoring at the Kahului site was discontinued on October 1, 1985. Data from Oahu do not represent ambient ozone and carbon monoxide concentrations for Kahului Airport because the island of Oahu is more industrialized and has many more emission sources.

Table 6.5.1.  
SUMMARY OF STATE OF HAWAII AND FEDERAL AMBIENT AIR QUALITY STANDARDS

<u>Pollutant</u>	<u>STANDARDS</u>		
	<u>Hawaii State Standard</u>	<u>Federal Primary Standard (a)</u>	<u>Federal Secondary Standard (b)</u>
Carbon Monoxide (CO)			
1 Hour	10,000 $\mu\text{g}/\text{m}^3$	40,000 $\mu\text{g}/\text{m}^3$	40,000 $\mu\text{g}/\text{m}^3$
8 Hour	5,000 $\mu\text{g}/\text{m}^3$	10,000 $\mu\text{g}/\text{m}^3$	10,000 $\mu\text{g}/\text{m}^3$
Nitrogen Dioxide (NO <sub>2</sub> )			
1 Hour	-	-	-
24 Hour	-	-	-
Annual (Arithmetic)	70 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$
Particulate Matter			
24 Hour	150 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$
Annual (Geometric)	60 $\mu\text{g}/\text{m}^3$	75 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$
PM-10 (c)			
24 Hour	-	150 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$
Annual (Arithmetic)	-	50 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
Ozone (O <sub>3</sub> )			
1 Hour	100 $\mu\text{g}/\text{m}^3$	235 $\mu\text{g}/\text{m}^3$	235 $\mu\text{g}/\text{m}^3$
Sulfur Dioxide (SO <sub>2</sub> )			
3 Hour	1,300 $\mu\text{g}/\text{m}^3$	-	1,300 $\mu\text{g}/\text{m}^3$
24 Hour	365 $\mu\text{g}/\text{m}^3$	365 $\mu\text{g}/\text{m}^3$	-
Annual (Arithmetic)	80 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$	-
Lead			
3 Months (Arithmetic)	1.5 $\mu\text{g}/\text{m}^3$	1.5 $\mu\text{g}/\text{m}^3$	1.5 $\mu\text{g}/\text{m}^3$

Notes:

- a. Designed to prevent against adverse effects on public health.
- b. Designed to prevent against adverse effects on public welfare including effects on comfort, visibility,, vegetation, animals, aesthetic values, and soiling and deterioration of materials.
- c. Particulate Matter which is 10 microns or less in diameter.

Source: Woodward Clyde Consultants



The area surrounding Kahului Airport may be influenced by neighboring sources of emissions such as burning of sugar cane, power generating facilities, and agricultural and industrial activities, as well as by Airport operations and traffic. Burning of sugar cane to clear fields can be a significant contributor of particulates, carbon monoxide (CO) and other pollutants.

#### 6.5.1.3 1989 Air Quality Baseline Data

Air quality impacts from ground and air traffic at and around the Airport were predicted assuming one hour of peak activity. The peak hour for air traffic occurs between 12:00 noon and 1:00 PM, with August as the peak month for aircraft operations at Kahului Airport.

Two peak periods for ground traffic correspond to morning and afternoon rush hours, with the afternoon peak traffic volumes greater than the morning peak traffic volumes. While air and ground traffic peak hours do not coincide, the maximum volumes were used to assess the relative impacts of each alternative. Thus, the results of the dispersion modeling represent conservative estimates of air quality impacts.

Air quality at the Airport perimeter during prevailing trade wind conditions are concentrated at the southern boundary of the Airport. The maximum one-hour impacts for the Baseline year-1989, at the receptor located near the fenceline along Hana Highway (directly downwind from Runway 2-20), are presented in Table 6.5.2.

## 6.5.2 PROBABLE IMPACTS

Dispersion modeling is used to predict increases in ambient pollution concentrations that result from the construction of new facilities, modification of existing facilities or modifications of normal operating patterns. Dispersion models have been developed to predict the dispersion of pollutants from specific sources, such as airports. The Emissions and Dispersion Modeling System (EDMS) is a commonly used microcomputer model for civilian airports. EDMS is currently under review by the U. S. Environmental Protection Agency.

### 6.5.2.1 General

Implementation of the Maui Long-Range Transportation Plan (LRTP) is expected to improve traffic flow and lessen air quality impacts due to ground traffic. In general, ground transportation improvements which bring about an increase in speeds and a lower vehicle queue length will tend to lessen air quality impacts for the same traffic volumes moving at slower speeds and queuing for longer times.

### 6.5.2.2 No-Action Alternative

#### Base No-Action Scenario

The maximum one-hour impacts for the Base No-Action Scenario are presented in Table 6.5.2. To determine whether any violations of State or Federal air quality standards would occur, the predicted maximum one-hour concentrations were converted to longer time periods using various conversion factors. Table 6.5.3 shows the results of the calculations. No violations of the Hawaii State or National Ambient Air Quality Standards (NAAQS) are indicated.

Table 6.5.2

## MAXIMUM ONE-HOUR AIR QUALITY IMPACTS

(Concentrations  $\mu\text{g}/\text{m}^3$ )

Scenario	CO	HC	NO <sub>x</sub>	SO <sub>x</sub>	Part
1989 - Baseline Trade Winds	448	48	140	6.0	3.0
1989 - Baseline Kona Winds	471	40	64	4.8	6.4
1989 - Baseline Calm	2930	834	2500	118	354
No Action† Trade Winds	307	120	189	9.3	50.7
No Action Kona Winds	202	60	96	7.8	8.4
No Action Calm	3060	1390	3810	18	530
Preferred Action Trade Winds	709	190	368	14.5	10
Preferred Action Kona Winds	287	82	219	8.8	5.9
Preferred Action Calm	7570	2140	6150	394	127

† Constrained No Action (10 percent less growth) was assumed to be the same for maximum one-hour impacts as takeoff-landing cycles and ground traffic average out to the same estimates.

Source: Woodward Clyde Consultants

Table 6.5.3

MAXIMUM AIR QUALITY IMPACTS\*

Pollutant	Hawaii State Standard	Maximum Predicted Concentration	Airport Development Alternative
Carbon Monoxide (CO)			
1-Hour	10,000 $\mu\text{g}/\text{m}^3$	7570 $\mu\text{g}/\text{m}^3$	Preferred Action
8-Hour	5,000 $\mu\text{g}/\text{m}^3$	NA†	
Nitrogen Dioxide (NO <sub>2</sub> )			
Annual (Arithmetic)	70 $\mu\text{g}/\text{m}^3$	36.8 $\mu\text{g}/\text{m}^3$	Preferred Action
Particulate Matter			
24-Hour	150 $\mu\text{g}/\text{m}^3$	NA†	No Action
Annual (Geometric)	60 $\mu\text{g}/\text{m}^3$	53 $\mu\text{g}/\text{m}^3$	
Sulfur Dioxide			
3-Hour	1,300 $\mu\text{g}/\text{m}^3$	NA†	Preferred Action
24-Hour	365 $\mu\text{g}/\text{m}^3$	NA†	
Annual (Arithmetic)	80 $\mu\text{g}/\text{m}^3$	39.4 $\mu\text{g}/\text{m}^3$	

\* Including calms

† Hourly sequential meteorological data were not available to model three time averaging periods.

Source: Woodward Clyde Consultants

Calm conditions on air quality impacts from the Airport were simulated using the lowest wind speed accepted by the model of 1 meter per second, and stable air mass, F stability. Under calm conditions a significant effect on air quality may be observed in the form of hot spots of high concentrations of criteria pollutants near the airport boundary. However, calm conditions are rare at Kahului Airport. Calm conditions would primarily occur at night when aircraft operations would be at a minimum (and not during the day when the peak ground and aircraft activity periods occur). Hence, no violations of State or Federal air quality standards are expected for any time averaging period.

#### Constrained No-Action Scenario

The maximum one-hour air quality impacts for the Constrained No-Action Scenario are the same as the Base No-Action Scenario because the maximum number of operations in an hour would be identical. The average annual impacts for the Constrained No-Action Scenario would be approximately 10 percent lower than the Base No-Action Scenario.

#### 6.5.2.3 Proposed Action

Since the maximum one-hour air quality impacts for the Base No-Action Scenario are the same as the Constrained No Action Scenario, the probable maximum one-hour air quality impacts of the Proposed Action would be the same under both No-Action Scenarios.

The maximum one-hour impacts for the Proposed Action are presented in Table 6.5.2. To determine whether any violations of State or Federal air quality standards would occur, the predicted maximum one-hour concentrations were converted to longer time periods using various conversion factors. Table 6.5.3 shows the results of the calculations. No violations of the Hawaii State or National Ambient Air Quality Standards (NAAQS) are indicated.

#### 6.5.2.4 Construction

The major short-term air quality impacts will be the potential emission of quantities of fugitive dust during project construction. During construction phases, emissions from engine exhausts, primarily consisting of carbon monoxide and nitrogen oxides, will also occur both from on-site construction equipment and from vehicles used to transport construction workers to and from the project site.

#### 6.5.3 POTENTIAL MITIGATION MEASURES

Since no violations of the Hawaii State or National Ambient Air Quality Standards are expected for vehicular and aircraft traffic, no special mitigation measures are considered to be necessary.

Strict compliance with State of Hawaii Air Pollution Control Regulations regarding establishment of a regular dust-watering program and covering of dirt-hauling trucks will be required to effectively mitigate fugitive dust emissions from construction activities. Twice daily watering is estimated to reduce dust emissions by up to 50 percent. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

## 7.0 SOCIO-ECONOMIC FACTORS

This Section discusses the potential socio-economic impacts related to residential and agricultural displacement, the visitor industry, and short and long-term employment. The socio-economic study was prepared by Earthplan and is included in its entirety as Appendix H.

### 7.1 EXISTING CONDITIONS

#### 7.1.1 HISTORICAL PERSPECTIVE

##### Naval Air Station Kahului

The site of Naval Air Station Kahului was originally leased from HC&S in the early 1940's. About one-third of the 1,350 acres of land leased was cultivated cane land while the remaining portion consisted of pasture land containing swamps and fish ponds<sup>4</sup>. The only existing facilities were electrical and telephone lines, and a railroad line which ran along a highway connecting the villages of Kahului and Spreckelsville.

The U.S. Navy acquired the present Kahului Airport site following the outbreak of World War II and developed it into the Naval Air Station Kahului, or NASKA. The development of this new airport was to support carrier-group operations and training. The military's need for this facility disappeared with the end of the war, and in 1947 the U.S. Government turned NASKA over to the Territorial Government. The new location proved superior to the old Puunene Airport site a few mile to the south, and in 1951 civil operations were transferred from Puunene to Kahului Airport where they have remained.

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<sup>4</sup> Building the Navy's Bases in World War II, History of the Bureau of Yards and Docks and the Civil Engineer Corps 1940 - 1946, Volume II, United States Government Printing Office, Washington, 1947.

### Early Forces Shaping Maui

The major forces shaping the early development of Maui parallel those which shaped Oahu which were port activities, Western influence and land interests, and the growth of the agricultural industry. Lahaina was the focal point of shipping activity for the Hawaiian kingdom by serving as the center for supplying merchant ships and loading of sandalwood until 1819. As sandalwood was exhausted, the explosion of the whaling industry from 1820 through 1860 occurred resulting in the port becoming a respite for sailors seeking shelter and recreation. Sugar has played and continues to exercise a major role in Maui's economy and social environment. Sugar was introduced in Wailuku by Reverend Richard Armstrong in 1840, and by 1846 the town boasted six sugar mills. Today, three sugar producers continue to operate on Maui. Pineapple is also a major force on Maui with the Maui Land & Pineapple company serving as the largest producer of pineapple on Maui.

Recently, the major influence in Maui's history has been the resort industry which has impacted Maui differently from Oahu. On Oahu, other forms of development such as residential and commercial have been the predominant focus of change since the resort industry has been localized in Waikiki. On Maui, the resort industry has become the impetus for change.

### 7.1.2 POPULATION TRENDS AND PROJECTIONS

#### Resident Population

The resident population is defined as the number of persons whose usual place of residence is in a given area, regardless of physical location on the census or estimate date. Maui County constituted nine percent of the estimated 1.1 million residents in the State of Hawaii in 1990. This tri-island county had an estimated resident population of 100,504 persons. Maui Island, with an estimated resident population of 91,361 persons, accounted for 91 percent of this.



Maui County's population growth has greatly exceeded statewide averages during the past two decades. The County's population grew by 54 percent from 1970 to 1980, and 42 percent from 1980 to 1990, while the statewide rates for the same periods were 25 and 15 percent, respectively. The rapid growth in residential population of the 1970's and 1980's is expected to slow slightly. Still, according to the State's M-K projections of population and economic growth for Maui County, the resident population is expected to increase by more than 40 percent, to 145,200 by the year 2010.

#### De facto Population

The de facto population is defined as the number of persons physically present in the area, regardless of usual place of residence. It includes visitors, but excludes residents temporarily absent. The de facto population of Maui County in 1990 was 137,300, with approximately one quarter of that total being visitors.

#### Visitor Population Trend

Because tourism is the county's largest industry, visitor population trends are very important. In the past, most of Maui's visitors have been from the mainland U.S. and Canada. However during three of the last four years, the number of visitors to Maui from these countries have declined. Growth from Far East countries, especially Japan, has helped to compensate for the westbound decline from 1986 to 1989, but in 1990, both westbound and eastbound visitors to Maui declined.

Visitors stayed on Maui Island for an average of 5.3 days in 1990. The average length of stay for westbound visitors was 6.4 days, and 3.0 days for eastbound visitors. This represents a decrease from 1989 when the average length of stay was 6.3 days (6.9 days for westbound and 3.2 days for eastbound visitors).

According to the State M-K projections, Maui County's de facto population is expected to reach 216,200 by the year 2010. The average daily visitor count for the County is expected to make up about one-third of the de facto population and is projected to reach 73,800. This is a 68 percent increase over the estimated 1989 average daily visitor count for Maui County of 44,020 persons.

### 7.1.3 ECONOMIC ACTIVITY

#### Profile of the Economic Base

Maui County's economy has been one of the strongest of the Neighbor Island economies over the past 20 years, primarily due to extensive resort development. During 1990, gross business receipts, an indicator of overall business activity, grew by 15.7 percent statewide, while Maui County receipts increased by 18.9 percent (First Hawaiian Bank, April 1991). Further, whereas visitor arrivals declined in 1990, construction activity increased significantly with non-residential building permit values more than doubling the 1989 level.

The retail trade was the largest industry in terms of activity and dollars. In 1987, 971 retail establishments generated over \$920 million in sales and paid nearly \$129 million in payroll expenditures. Over 12,800 employees participated in the retail business.

Service industries were the second highest in terms of activity and dollars. The 725 service establishments collected over \$650 million in receipts and employed almost 12,500 employees. The service industries payroll of over \$190 million was 48 percent higher than the amount paid out by retail businesses, even though the retail industry had several hundred more employees.

### Visitor Industry

Maui County had over 18,000 visitor units in 1990, including hotel, apartment-hotel, condominium, bed and breakfast, and other units. Of these, over 17,000 are on Maui Island. The 1990 hotel occupancy rate for Maui Island was 70 percent, up from 69 percent in 1989. Maui Island average daily room rates were among the highest in the State in 1989 and 1990. However, in 1990, Maui Island was the only resort area where rates decreased, dropping to \$130 from the \$134 average of 1989.

In 1989, total visitor spending in Maui County was estimated at over \$2.3 billion with westbound visitors accounting for \$1.8 billion or 77 percent of the total. The visitor industry is the largest industry in Maui employing the highest percentage of primary wage earners at 18 percent.

Table 7.1.1 presents the current and planned levels of visitor units in Maui County. Currently, Maui Island's 17,361 visitor units comprise 95 percent of the county's total. Approximately 9,200 units are either approved or in the planning or approval stages. If all of these were built, Maui Island would have about 26,561 visitor units. In 1988, State DBED projected Maui County's visitor units could grow to 33,000 by 2010, which is an 83 percent increase over the existing number of units.

## **7.2 SOCIAL ISSUES**

Social impacts are those changes which are likely to occur given the nature of the project and the social context in which these actions would occur. Social issues are community concerns which arise in response to a project. Social issues often shift over time, as people's priorities, environment and lifestyles change. This is often demonstrated in polls taken over time which indicate shifts in community priorities. The purpose of discussing social issues in this report is to include the community's opinions and sentiments in the decision-making process, as well as to expand the social context for identifying social impacts of the improvements at Kahului Airport.

Table 7.1.1  
Maui County Visitor Units, Existing and Planned

Location	Existing	Planned	Existing and Planned	Percent of County
<b>Maui Island</b>				
Hotel	8,008	6,816	14,824	
Condo & Other	9,353	2,384	11,737	
<b>Total</b>	<b>17,361</b>	<b>9,200</b>	<b>26,561</b>	<b>94.1%</b>
<b>Molokai</b>				
Hotel	326	60	386	
Condo & Other	233	436	669	
<b>Total</b>	<b>559</b>	<b>496</b>	<b>1,055</b>	<b>3.7%</b>
<b>Lanai</b>				
Hotel	362	250	612	
Condo & Other	3	0	3	
<b>Total</b>	<b>365</b>	<b>250</b>	<b>615</b>	<b>2.2%</b>
<b>Maui County</b>				
Hotel	8,696	7,126	15,822	
Condo & Other	9,589	2,820	12,409	
<b>Total</b>	<b>18,285</b>	<b>9,946</b>	<b>28,231</b>	<b>100.0%</b>

*SOURCE: Hawaii Visitors Bureau, 1990 VISITOR PLANT INVENTORY, 1990. Hawai'i State Department of Business, Economic Development and Tourism records, 1991. Community Resources, Inc. files, 1991.*

### **7.2.1 AIRPORT COMMUNITY ISSUES**

The identification of issues related to the improvements at Kahului Airport was based on the review and analysis of (1) issues raised at the scoping meeting for the EIS; (2) newspaper and magazine articles from mid-1989 to the present; (3) DOT correspondence and noise log files; and (4) responses to the Environmental Assessment, EIS Preparation Notice, and Draft EIS. Table 7.2.1 summarizes the "nature of the issues," summary statements made by the community, and applicable references to the EIS sections that address the issues.

### **7.3 PROBABLE IMPACTS**

#### **7.3.1 NO ACTION ALTERNATIVE**

Neither of the No Action Scenarios would require land acquisition resulting in the displacement of existing land uses. The property owners retaining their lands are Alexander and Baldwin, Inc. (agricultural lands) and Spreckelsville homeowners.

##### **7.3.1.1 Base No Action Scenario**

Under the Base No Action Scenario, the following conditions are expected to result:

- About 4,352,200 people would visit Maui County in 2010, most of whom would visit Maui Island;
- An additional 16,000 units would need to be added to the existing Maui County visitor unit inventory to support that level of visitor arrivals;
- Economic activity from tourism and other sources would result in 81,300 Maui County jobs;
- This activity would support a Maui County resident population of 152,900 in 2010; and
- Maui County would need 55,400 residential units to house the estimated population.

Table 7.2.1 Summary of Community Issues Regarding Airport Improvements and Expansion

ISSUE	NATURE OF THE ISSUE	SUMMARY	COMMENT
<p>1. GROWTH-RELATED ISSUES:</p> <p>Kahului Airport's role in population growth, infrastructure problems, and social changes</p>	<p>"The airport is a valve. The wider the valve, the more people can come to Maui. If you want to control population, you control the valve. If the valve is not widened, then less people would come to Maui."</p> <p>"Airport improvements will increase the population, and worsen conditions on the roads, strain the sewerage system, deplete the water supply, crowd our schools, and so on."</p> <p>"If the airport improvements will bring in more people than would otherwise visit Maui, the expansion itself may lead to more new residents and possible conflicts between existing cultures and those of the newcomers"</p>	<p>Opposition to airport improvements on the basis of growth stems from a belief that the airport should be used as a growth management tool. To these people, constraining airport expansion is the "first line of defense against population and visitor industry growth."</p> <p>Most vocal advocates of this position are Maui Air Traffic Assoc., Hui Ala Nui O Makana and Maui Tomorrow. Some elected officials and numerous individuals have expressed this viewpoint.</p> <p>Though the polls show that the majority of Maui residents object to further resort development, it does not mean most people oppose airport improvements. Some advocates of controlled growth see other mechanisms (such as visitor units) as growth management tools.</p>	<p>Comment 1. Aviation demand forecasts (Sec. 4.0) discuss the projected number of passengers which can be accommodated under both the No Action and Proposed Action.</p> <p>Comments 1a. The same number of visitors are expected under the Based No Action and Proposed Action. Discussion of probable impacts associated with Constrained No Action Scenario is provided in respective sections.</p>
<p>2. INTERNATIONAL FACILITIES</p> <p>Increase in Population</p> <p>Introduction of Diseases, Exotic Plant Species and Prohibited Animals</p>	<p>"An international airport would bring more people, thus exacerbating the problems of rapid growth."</p> <p>"An international airport would make Maui more easily exposed to certain diseases. Biologically sensitive areas like Haleakala may be threatened by plants and animals brought in from the international facility. Also our crops may be threatened."</p> <p>"Maui would become a port of entry for international drug trafficking."</p>	<p>Of the 24,000 increase in population during the '70's, many were "newcomers." In an effort to find stability in the community, both long-time residents and newcomers hope to slow the pace of growth. The airport is key if one sees it as a growth management tool.</p> <p>This issue is based on a belief that some foreign visitors would not visit Maui if there were no international facilities. This is directly related to a belief that airport facilities can control growth.</p> <p>These two issues have been raised by farmers, doctors, biologists and the community. Some want to make sure potential dangers are avoided. Others add these two issues to the reasons to not build international facilities.</p>	<p>Comment 2. In response to the Maui County General Plan's policy against internationalization of Kahului Airport, DOT has decided not to include an International Arrivals Facility in the Master Plan.</p>
<p>3. ECONOMIC IMPACT ISSUES</p> <p>Benefit the Visitor Industry</p>	<p>"The airport improvements should be built so that our visitor industry can continue to grow and thrive."</p>	<p>This view is the 'flip side' of the growth management view. Those who believe that the improvements will benefit tourism believe that runways and terminals will bring more people and tourist dollars to Maui.</p>	<p>Comment 3. Master Plan analyses show that existing Airport facilities can accommodate the projected number of visitors. The Constrained Scenario reflects the potential increased market due to a longer runway.</p>

Source: Earthplan, and Pacific Planning and Engineering, Inc.

Table 7.2.1 Summary of Community Issues Regarding Airport Improvements and Expansion

ISSUE	NATURE OF THE ISSUE	SUMMARY	COMMENT
Benefit Farmers	<p>"Airport improvements will let flower and produce farmers ship products faster."</p> <p>"The existing runways are fine. No need to improve the airport for us farmers."</p>	<p>The entire community, farmers included, has expressed views on both sides of this issue.</p>	<p>Comment 3a. Longer runways should facilitate air cargo shipments to more markets. See Sections 3.3.1, 10.4 12.2.4.</p>
Impact on Nearby Business	<p>"What will be the impacts on nearby businesses? These businesses are already being impacted by ongoing construction."</p>	<p>Roads near the Airport have been under construction for the last couple of years. Drainage improvements have also added to construction impacts. These comments reflect a concern that nearby businesses will continue to experience construction impacts and will suffer economically.</p>	<p>Comment 3b. Road improvements under consideration are discussed in Section 6.1. Impacts to nearby agricultural and commercial businesses discussed in Section 7.0.</p>
4. AIRPORT OPERATIONS AND SAFETY ISSUES	<p>"We want to see the airport runways at a length that would make it safer to land."</p>	<p>The first view has generally been expressed by those in the aviation industry, and by those who do not see the airport as a growth management tool. The Maui Chamber of Commerce, Maui Hotel Association, and Maui Hotel Visitors Bureau have also asserted this opinion.</p>	<p>Comment 4. Operational issues are discussed in Section 9.0.</p>
Operational Impacts on Nearby Communities	<p>"Are the existing runways really unsafe? Do we really need the proposed improvements?"</p>	<p>The second view reflects a skepticism about the necessity of runway lengthening and parallel runway. Those who express this opinion see the proposed improvements as the State's way to support tourism.</p>	<p>Comment 4a. Probable noise impacts resulting from the Proposed Action are discussed in Section 6.4. The FAR Part 150 Noise Compatibility Program is intended to mitigate noise impacts to noise sensitive properties.</p>
5. MEDICAL EMERGENCIES	<p>"We're already subject to noise from aircraft. We don't want problems of larger aircraft and more frequent flights."</p>	<p>According to DOT logs, most noise complaints come from central Maui. Spreckelsville residents cited early morning and night air cargo flights. Kula, Haiku, Hana and Kihui residents were concerned about helicopters and small aircraft. To them an improved airport means more and bigger aircraft, hence more noise.</p>	<p>Comment 5. The potential for an aircraft emergency is same for both the No Action and Proposed Action because the number of aircrafts and passengers are relatively the same. Under the Constrained Scenario, fewer passengers may result. The longer runway should provide a greater margin of error for pilots. These issues are discussed in greater detail in Section 8.8.</p>
5. MEDICAL EMERGENCIES	<p>"We have difficulty meeting current needs. Longer runways will bring larger aircraft transporting large numbers of people. We won't be able to handle large emergencies."</p>	<p>This view has been most strongly expressed by doctors at Maui Memorial Hospital. Currently, the hospital is undergoing physical and administrative improvement, and a Rapid Deployment Team recently received accreditation. This issue will continue until there are noticeable changes in facilities and service delivery.</p>	

Table 7.2.1 Summary of Community Issues Regarding Airport Improvements and Expansion

ISSUE	NATURE OF THE ISSUE	SUMMARY	COMMENT
6. DISPLACEMENT ISSUE			
Residential Displacement	<p>"The airport is slowly encroaching upon Spreckelsville. Proposed improvements will make more of us move out."</p>	<p>Many residents are already potential displacees because of existing noise levels. To them, expansion of airport facilities means more displacement.</p>	<p>Comment 6. Potential residential and agricultural displacement discussed in Section 7.3. Potential impacts on agricultural lands are discussed in Section 5.1.</p>
Agricultural Displacement	<p>"Airport improvements will take hundreds of acres from sugar cultivation, and may threaten mill stacks. The changed roadways will impair our own transportation needs."</p>	<p>Agriculture officials and the general community have raised this issue which is consistent with poll results. For Maui residents, agriculture means open space, rural lifestyle, and a defense against urban encroachment.</p>	<p>Comment 6a. DOT is working with County in developing a Shoreline Recreational Plan to address facility needs and resources in the area. See Section 8.9.</p>
Recreational Activities	<p>"A longer runway and a new runway would threaten our beach parks and shoreline activities."</p>	<p>Maui residents want more recreational space. Any potential reduction represents a threat.</p>	
7. STATE AND COUNTY RELATIONSHIPS:			
Participation in Decisionmaking	<p>"The State is not asking Maui residents what we want. It keeps pursuing improvements we oppose."</p>	<p>This represents a frustration frequently expressed over the years, and involves more than airport facilities. It is felt that State officials are controlling what is rightfully Maui County's to manage.</p>	<p>Comment 7. Community opinion was obtained through several channels. Airport Community issues discussed in Section 7.2.1. The Master Plan Update is being prepared with extensive input from the public and airport users.</p>
County vs State Policies	<p>"We want a way to control growth and want strict growth management policies. But the State is trying to supersede our efforts by expanding our airport"</p>	<p>This is frequently raised by those who view the Airport as a growth management tool. They see the Airport as the State's effort to bolster tourism at the expense of Maui residents and environment.</p>	<p>Comment 7a. See Regional Issues discussed in Section 9.7.</p>
8. EIS ISSUES:			
Need for an EIS	<p>"The State has been doing piecemeal studies and keeps coming up with findings of no significant impact. We want an EIS for collective proposals."</p>	<p>This issue was the subject of a lawsuit and was resolved with the State's initiation of an EIS. However this issue puts the EIS in a "defensive" position if the community feels that the State was forced to prepare this document.</p>	<p>Comment 8. The EIS did evaluate the probable impacts of the airport improvements under consideration by the Master Plan Update study.</p>
Validity of Forecasts	<p>"The EIS will be flawed because it is based on forecasts which represent the State's wish list for the tourist industry."</p>	<p>Those who believe the Airport is a growth management tool have expressed suspicions that the DBED and DOT forecasts were designed to support tourism. To them, subsequent studies based on these forecasts are flawed.</p>	<p>Comment 8a. The Forecast methodology and assumptions are discussed in Section 2.3.</p>



General aviation operations are forecast to increase 48 percent from 49,823 operations in 1989 to 74,000 operations in 2010. However, because of the expected increase in air traffic at Kahului Airport, up to 50 percent of the projected general aviation (training) operations that pilots would like to conduct could not be accommodated resulting in only 51,800 general aviation operations occurring.

American Pacific Air, Inc. is the largest general aviation operator on Maui and currently provides pilot training for 35 to 40 students, of whom about 95 percent are Maui residents. If general aviation local operations were reduced or training costs escalated to prohibitive levels, the frequency and availability of pilot training along with opportunities for career advancements as commercial pilots would be reduced.

#### 7.3.1.2 Constrained No Action Scenario

Under the Constrained No Action Scenario, the level of passenger activity could be reduced by up to ten percent by the limited availability of non-stop flights to the mainland. The resulting economic and demographic conditions are shown on Table 7.3.1 which compares the Constrained No Action Scenario with the Base No Action Scenario. Under this scenario, the following conditions could result:

- Up to 4,014,600 people would visit Maui County in 2010, most of whom would visit Maui Island;
- An additional 13,100 units would need to be added to the existing Maui County visitor unit inventory to support that level of visitor arrivals;
- Economic activity from tourism and other sources would result in 71,900 Maui County jobs;
- This activity would support a Maui County resident population of 135,200 in 2010; and
- Maui County would need 49,000 residential units to house the estimated population.

As shown on Table 7.3.1, there would be eleven percent fewer passengers (906,000 passengers) at Kahului Airport than the Base No Action Scenario. In terms of visitor arrivals, there would be eight percent less (311,600) visitor arrivals for Maui Island which translates into approximately 6,500 daily visitors less than would occur under the Base No Action Scenario. The level of general aviation operations which could be accommodated under this scenario are forecast to be 49,200 resulting in slightly greater impacts than for the Base No Action Scenario .

### 7.3.2 PROPOSED ACTION

#### Residential, Agricultural and Commercial Displacement

Under the Proposed Action, agricultural land would need to be acquired for the Airport Access Road, the extension of Runway 2L-20R, and the construction of a new parallel Runway 2R-20L and supporting taxiways. As a result, the primary property owner that would be affected is Alexander and Baldwin, Inc. due to their ownership of surrounding agricultural lands. Impacts to agricultural production are discussed under Section 5.1.

As previously discussed in Section 6.4.2.2, Spreckelsville homeowners currently in the 60 Ldn contour may have the option of selling their properties to the State or receiving sound attenuation treatment for their homes under the FAR Part 150 Noise Compatibility Program. However, some of those property owners electing to receive sound attenuation treatment under the FAR Part 150 Noise Compatibility Program would be displaced by the 8,500 foot parallel runway.

**Table 7.3.1**  
**Economic and Demographic Conditions with**  
**Constrained No-Action Scenario and Proposed Action**

Impact Measures	Existing Conditions		Future With Constrained No Action Scenario		Future Expected With Proposed Action		Difference Between Constrained No-Action and Proposed Action	
	1990	Percent	2010	Percent	2010	Percent	% Change	
<b>Passengers</b>								
Maui County	5,591,485	100%	10,001,000	100%	10,907,000	100%	906,000	9%
Maui Island	5,147,397	92%	9,136,000	91%	10,042,000	92%	906,000	10%
Kahului	4,936,971	88%	8,153,000	82%	9,059,000	83%	906,000	11%
<b>Visitor Arrivals (1)</b>								
Maui County	2,389,970	100%	4,014,600	100%	4,352,200	100%	337,600	8%
Maui Island	2,345,060	98%	3,773,200	94%	4,084,800	94%	311,600	8%
<b>Avg. Visitor Census (1)</b>								
Maui County	NA	NA	70,000	100%	76,500	100%	6,500	9%
Maui Island	34,052	NA	65,800	94%	71,800	94%	6,000	9%
<b>Visitor Units (1)</b>								
Maui County	18,285	100%	31,400	100%	34,300	100%	2,900	9%
Maui Island	17,361	95%	29,500	94%	32,200	94%	2,700	9%
<b>Civilian Jobs (2)</b>								
Maui County	56,060	100%	71,900	100%	81,300	100%	9,400	13%
Maui Island	52,620	94%	67,500	94%	76,300	94%	8,800	13%
<b>Resident Population (2)</b>								
Maui County	100,504	100%	135,200	100%	152,900	100%	17,700	13%
Maui Island	91,361	91%	127,000	94%	143,500	94%	16,500	13%
<b>Housing Units (2)</b>								
Maui County	42,160	100%	49,000	100%	55,400	100%	6,400	13%
Maui Island	38,422	91%	46,000	94%	52,000	94%	6,000	13%

Notes to Exhibit 1:

(1) Maui County visitor arrivals, average visitor census, and visitor units for 2010 estimated as shown in Table 25 of Socio-Economic Impact Assessment (Earthplan, 1991). Maui Island estimates based on Maui Island's share of known Maui County existing and planned visitor units.

(2) Maui County civilian jobs, resident population, and housing units for 2010 estimated based on levels forecast in DBED M-K projections as adjusted for higher visitor arrivals in DOT forecast. Maui Island estimates based on Maui Island's 1990 share of Maui County civilian jobs.

SOURCE: Wilson Okamoto and Associates, Inc. and Aries Consultants, Ltd, 1990 and records, 1991. Hawaii Visitor Bureau records, 1991. Hawaii's State Department of Business, Economic Development and Tourism records. Hawaii's State Department of Labor and Industrial Relations records, 1991. U.S. Census Bureau, 1990 CENSUS OF POPULATION AND HOUSING, 1991.

The Airport Access Road would divert a significant amount of traffic from Dairy Road and Keolani Place, which could decrease the amount of traffic and level of activity conducted at businesses located along these roads.

#### Employment and Personal Income

Approximately 1,000 persons are currently employed at the Airport. Table 7.3.2 presents projected future employment levels at Kahului Airport in the year 2010 with proposed airport improvements implemented. Estimates were based on employment levels reported by various existing firms at Kahului Airport surveyed in 1990 and 1991 by Belt Collins & Associates. Employment was identified as being either related to passenger activity or to airport operations. Ratios between employment and passengers or operations were then applied to DOT's aviation demand forecasts to estimate the 2010 employment levels.

The number of construction jobs per year were estimated using preliminary construction cost estimates, and ratios derived from the State Department of Business, Economic Development and Tourism Input-Output Model. The number of annual construction jobs generated by the Proposed Action was estimated to be 232 jobs per year which produce a total annual income of \$9,397,000. The majority of these jobs would be associated with the Access Road and runway projects.

#### General Aviation

Under the Proposed Action, the parallel runway and supporting taxiways would allow the level of general aviation operations forecast (74,000) in the year 2010 to be accommodated at Kahului Airport. As a result, 22,200 additional operations would occur over both the Base and Constrained No-Action Scenarios and not impact the future level of local (training) operations and opportunities for career advancements as commercial pilots.

**Table 7.3.2  
Projected Future Employment Levels**

	Jobs to Passengers Ratio (per 1,000)	Proposed Action	
		2010 Passengers (in 1,000)	Estimated Airport Jobs
<b>Passenger-Related Employment</b>			
Private Firms	0.12	9,059	1,090
Public Agencies	0.03	9,059	240
<b>Total Public and Private</b>	0.15	9,059	1,330
<b>Operations-Based Employment</b>			
Total Operations Based	0.10	306.0	30
commuter/Air Taxi Based	0.35	56.7	20
Fixed Wing General Aviation Base	5.31	74.0	390
Helicopter Based	5.95	63.3	380
<b>Total Operations-Based</b>			820
<b>TOTAL AIRPORT EMPLOYMENT</b>			2,150

Source: Earthplan

#### 7.3.2.1 Comparison With Base No Action Scenario

With the improvements recommended by the Master Plan, the level of passenger activity at Kahului Airport is expected to remain the same as the activity forecast under the Base No Action Scenario.

#### Visitor Industry

The forecasts under this scenario indicate that the number of passengers, and the mix of westbound and eastbound visitors to Maui, are not expected to change with the extension of Runway 2-20, a parallel runway, a new heliport location, or other airport improvements. Therefore, projects recommended by the Master Plan for Kahului Airport are not expected to significantly affect the growth of the visitor industry, or visitor industry jobs beyond that which is already projected.

#### 7.3.2.2 Comparison With Constrained No Action Scenario

It was found that regardless of the extent of airport improvements conducted, Maui County will not have the tourist-based facilities needed to support the level of forecast activity at Kahului Airport based on the amount of predictable resort development. The projected level of passenger traffic for 2010, in either the Constrained No Action Scenario or Base No Action Scenario, will not be realized if the visitor facilities (visitor rooms, golf courses, beach facilities, shopping areas, etc.) and the resort workers do not exist to attract and meet the needs of the projected visitors to Maui County. Regardless of how many people can be accommodated in the passenger aircrafts, airport terminal and on airport runways, the numbers of visitors to Maui will depend on how many can be accommodated on the island once they arrive.

It is further found, however, that even though the Proposed Action improvements would not directly cause growth, the proposed improvements could have a facilitating effect on Maui County's growth should the citizens choose to increase the supply of visitor units, etc. The Base No Action Scenario and the Proposed Action forecasts could allow the handling of up to 906,000 more passengers at Kahului Airport in 2010. This means that the improvements could facilitate the passage of 337,600 more visitors than if improvements were not made.

#### Visitor Industry

Under the Constrained No Action Scenario, an estimated 31,400 visitor units, including hotel, condominium, and other units would be required to house the projected number of Maui County visitors. In 1990, Maui County had an estimated 18,285 visitor units, and plans and proposals for construction of almost 10,000 additional units. Over 92 percent of the planned and proposed additional units will be located on the island of Maui.

Therefore, over 3,100 visitor units will be needed to accommodate the forecast level of activity in addition to what is already existing and proposed. The Base No Action Scenario visitor unit requirement is 6,000 units. Thus, regardless of the level of improvement at Kahului Airport, there will still be a need for at least 3,000 more visitor units in addition to existing and planned visitor units to meet projected demand.

#### Jobs, Population, and Housing

If sufficient visitor industry capacity was created, the projected level of visitor arrivals under the Constrained No Action Scenario could result in a Maui County economy providing 71,900 jobs by the year 2010. As a result, the increased passenger activity forecast under the Proposed Action could result in up to 9,400 (13%) more jobs for Maui County. With 94 percent of the jobs occurring on the island of Maui, up to 8,800 additional jobs would be created.

This increased level of employment for Maui County under the Proposed Action would be supported by a resident population of 152,900 people. Thus, up to 18,000 more people could be living in Maui County than the 135,200 people estimated under the Constrained No Action Scenario. Regardless of the level of airport improvements, Maui County's population would need to grow by between 35,000 to 52,400 persons to provide the labor force necessary to support the estimated demand for visitor units.

Under the Constrained No Action Scenario, a housing supply of 49,000 units may be needed to house a population of 135,300 people in Maui County. With the Proposed Action, 55,400 housing units would be required for Maui County, which is 6,400 more units than the Constrained No Action Scenario.

### 7.3.3 COMPARISON WITH MAUI COUNTY FORECASTS

Maui County is currently updating the nine regional Community Plans which address specific regional needs and outline recommendations for regional planning and development. Included in this update process are socio-economic forecasts prepared by Maui County for the target years from 1995 to 2010. Two sets of County forecasts have been prepared thus far which are:

1. Unconstrained socio-economic forecasts. The basis for this set of forecasts was the State M-K projections for Maui County, with minor adjustments to reflect existing and projected government jobs levels.
2. Constrained socio-economic forecasts. One type of limit on Maui County growth is developable land zoned for visitor units. When the visitor industry development patterns projected in the unconstrained socio-economic forecast were compared with the estimates of existing developable land zoned for visitor units, it was determined that by the year 2000, no additional visitor units could be built. Further, by the year 2005, occupancies would be approaching maximum levels.



### Comparison With Kahului Airport Forecasts

The basic difference between the Airport's and the County's constrained forecasts is the constraining variable. For Kahului Airport, the variable which could constrain passenger activity is the extension of Runway 2-20. The County's constraining variable is the amount of available land zoned for visitor units. Table 7.3.3 provides a comparison of DOT's forecasts with the County's constrained forecasts.

#### 7.4 POTENTIAL MITIGATION MEASURES

DOT will follow the requirements specified in the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended for any displacement of property owners resulting from the proposed project. This law provides for expeditious negotiation in the acquisition of real property, relocation benefits, payment for moving expenses, and replacement housing payment. DOT will inform affected parties of the full requirements and entitlements under this law.

**Table 7.3.3  
Comparison of Both Airport Forecasts and Maui County Forecasts**

	Airport Forecast for 2010		Maui County Forecast for 2010 (*)		Difference Between Both Airport Forecasts and County Constrained Forecast	
	Constrained No-Action	Proposed Action	Unconstrained (M-K)	Constrained	Constrained	Proposed Action
	Population	135,200	152,900	145,872	138,379	(3,179)
Housing Demand	49,000	55,400	52,948	50,228	(1,228)	5,172
Average Visitor Census	71,800	76,500	73,800	67,563	4,237	8,937
Jobs	76,300	81,300	77,657	73,674	2,626	7,626

Sources: Earthplan

## 8.0 INFRASTRUCTURE AND PUBLIC FACILITIES

### 8.1 GROUND TRANSPORTATION

The following is a summary of the traffic impact study conducted by Pacific Planning & Engineering, Inc. The study identified and evaluated the probable impacts of traffic generated by the airport improvements under consideration in the year 2010. The initial report and a supplemental Technical Memorandum are included in their entirety in Appendix I.

#### 8.1.1 INTRODUCTION

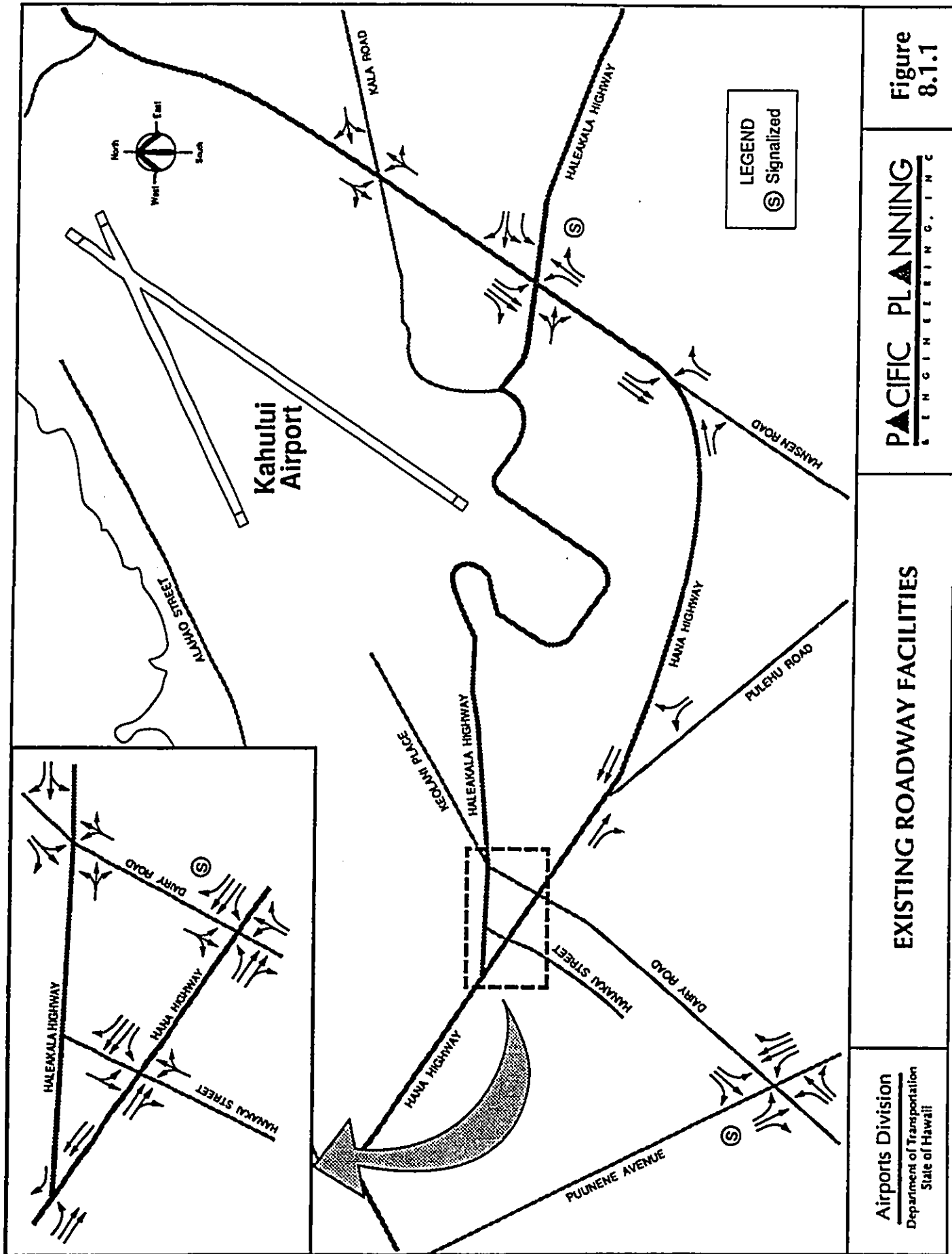
Eight intersections along Hana Highway and Dairy Road/Kuihelani Highway were analyzed. These intersections were studied based upon recommendations from the State Department of Transportation, Highways Division and the County of Maui. The eight intersections studied were:

- Hana Highway with Hanakai Street and Haleakala Highway
- Hana Highway with Dairy Road
- Hana Highway with Pulehu Road
- Hana Highway with Hansen Road
- Hana Highway with Haleakala Highway
- Hana Highway with Kala Road
- Dairy Road with Haleakala Highway and Keolani Place
- Kuihelani Highway with Puunene Avenue

In addition, highway on and off-ramps associated with the proposed interchange of the new Airport Access Road with Hana Highway were analyzed.

#### 8.1.2 EXISTING CONDITIONS

Figure 8.1.1 shows the roadway network in the vicinity of the Airport which serves a combination of regional and local traffic.



#### 8.1.2.1 Existing Roadway Facilities

Hana Highway is a State-maintained roadway that carries traffic between Kahului/Wailuku and eastern communities along the coast to Hana. Between Kaahumanu Avenue and Dairy Road, Hana Highway has two lanes in each direction with a posted speed limit of 30 miles per hour (mph). From its intersection with Dairy Road, Hana Highway has four travel lanes to the signalized intersection with Haleakala Highway. (Note: during the period the traffic survey was performed, Hana Highway had three travel lanes open with the center lane used for contra-flow traffic during the afternoon peak periods). The posted speed limit is 55 mph. Beyond the southern intersection of Haleakala Highway, Hana Highway is reduced to two lanes with one travel lane in each direction.

Haleakala Highway is a two-lane State roadway linking the Airport area with the upcountry areas of Maui. Within this section surrounding Kahului Airport, Haleakala Highway has a posted speed limit of 30 mph which increases to 55 mph east of its intersection with Hana Highway.

Keolani Place serves as the primary access to Kahului Airport's terminal facility. This roadway has recently been widened from two to four lanes between Palapala Drive and the intersection of Dairy Road with Haleakala Highway, and has a posted speed limit of 30 mph.

Dairy Road is a two-lane roadway with a posted speed limit of 30 mph. Between Hukilike Street and Puunene Avenue, Dairy Road becomes Kuihelani Highway. The posted speed limit on Kuihelani Highway increases to 55 mph south of its intersection with Puunene Avenue. Presently, most of the Airport traffic utilizes Dairy Road/Keolani Place and Haleakala Highway. Some Airport traffic may use Alahao Street, but this roadway is used primarily by Kanaha Beach Park users.

### 8.1.2.2 Existing Traffic Conditions

Manual traffic counts were taken at the study intersections in mid-August 1990 during the weekday morning and afternoon peak periods. Due to locational differences of the intersections, the start of the weekday commuter morning peak hour varied between 7:00 and 7:30 a.m. Similarly, the beginning of the afternoon commuter peak ranged between 3:15 and 5:00 p.m.

Traffic volumes along Hana Highway and Kuihelani Highway/Dairy Road are highest during the commuter peak hours. These hours were used to assess the Airport traffic impacts, since the critical impact of the Airport traffic would culminate during the commuter traffic peak hours.

### 8.1.3 PROBABLE IMPACTS

#### 8.1.3.1 Island-Wide Long-Range Highway Plan for Maui

The State Department of Transportation, Highways Division, and the County Departments of Planning and Public Works have cooperatively undertaken a study to develop a long-range plan for highway improvements on Maui. The findings of the study are documented in a draft report entitled "Island-Wide Long-Range Highway Plan for Maui" (LRHP).

Future land uses were forecast for the island of Maui in the year 2010 based on land use assumptions from the LRHP, and research of approved planned developments and improvements to transportation facilities. The land use forecasts indicated that Maui's population would grow in all areas, except Puunene. Furthermore, the regions of Lahaina and Kihei/Makena would increase their net share of the island's population, while other areas would generally remain the same or decrease. In terms of employment, the Kihei/Makena region would equal the Wailuku/Kahului and the Lahaina regions while other parts of the island would contribute less than 8 percent to Maui's employment.

The LRHP also identified many traffic improvement projects that would be needed by 2010. Recommended improvements that would provide additional capacity on the regional system and would directly affect traffic in the vicinity of the Airport include:

- Widen Haleakala Highway from two to four lanes between Hana Highway and Haliimaile Road.
- Widen Kuihelani Highway from two to four lanes between Puunene Avenue and the proposed Maui Lani Parkway.
- Construct a new highway between Pukalani and Kihei.
- Construct a new highway between Kula and Wailea.
- Construct the Puunene bypass road from Kuihelani Highway at the proposed Maui Lani Parkway intersection and connect to Mokulele Highway.
- Widen Mokulele Highway from two to four lanes from the proposed Puunene bypass road to Piilani Highway.
- Construct the four-lane Kuihelani Highway Extension between Puunene Avenue and the Airport terminal; this roadway is also known as the Airport Access Road.

If the Airport Access Road is constructed, Haleakala Highway would be terminated on both sides of the Airport Access Road. As a result, traffic currently traveling via Haleakala Highway would need to be rerouted to Hana Highway. However, Haleakala Highway would continue to be available to serve local traffic on each side of the Airport Access Road.

#### 8.1.3.2 Traffic Projections

Airport-related trips were included in the LRHP. For the purposes of this study, the Airport traffic was adjusted to reflect differences in the airport alternatives studied. The roadway network was also adjusted to account for differences in the roadway layouts used for each alternative.

Future non-airport related traffic was forecast for the different alternatives using the following method:

- (1) Forecast regional traffic volumes were based on the LRHP using daily traffic volumes provided for selected intersections.
- (2) Peak hour volumes were estimated from the total daily volumes by using the percent of daily traffic occurring during the peak hour ("K" factor) and the directional split of the traffic ("D" factor).
- (3) The regional traffic volumes were assigned onto the roadway network based on current travel patterns and the land use forecast data from the LRHP.

The volume of airport-related traffic was projected using passenger forecasts for each alternative.

Vehicle trip rates were derived from reviews of historical data of passenger trends<sup>5</sup> and DOT vehicle traffic counts<sup>6</sup>. The projected airport traffic for the alternatives considered in this EIS are shown in Table 8.1.1.

Table 8.1.1. Airport-Related Traffic  
(Vehicles per Hour)

<u>Alternatives</u>	<u>Morning Peak Hour</u>		<u>Afternoon Peak Hour</u>	
	<u>Enter</u>	<u>Exit</u>	<u>Enter</u>	<u>Exit</u>
Base No-Action	1,107	738	900	1,100
Constrained No-Action	997	664	810	990
Proposed Action	1,107	738	900	1,100

Source: Pacific Planning & Engineering, Inc.

<sup>5</sup> State Department of Transportation, Airports Division, Planning Branch, Kahului Airport Passenger Counts, 1985, 1987, 1989.

<sup>6</sup> State Department of Transportation, Highways Division, Planning Branch, Station 4-C, 1985, 1987, 1989.



The traffic volumes developed for the LRHP indicate that travel patterns on Maui would change as a result of the different land uses forecast for the year 2010. For instance, Wailuku/Kahului would generate more residential commuter trips in the future, but many of these trips would remain in this area because employment opportunities in Wailuku/Kahului would also grow. In addition, commuter travel between the residential upcountry areas and the employment-related activity in Kihei/Makena areas would increase.

### 8.1.3.3 Roadway Facilities

#### No Action Alternatives

The roadway network used for traffic projections of alternatives assumes the completed widening of Keolani Place and Hana Highway to four travel lanes. Except for these changes there were no other roadway improvements included in the traffic projections for the No-Action alternatives.

#### Proposed Action

For the Proposed Action, the Airport Access Road and the interchange with Hana Highway were incorporated into the roadway network. As a result, a portion of Haleakala Highway within the Airport would be closed, and traffic would be rerouted to Hana Highway. In addition, Pulehu Road would need to be realigned, and its intersection with Hana Highway would be relocated approximately 3,600 feet south of its existing location. All turning movements would be allowed and traffic signals would be installed at this new Pulehu Road intersection.

The 8,500 foot parallel runway would eliminate the existing access to the east ramp area via Kala Road and Haleakala Highway. A new access road to the east ramp, which is referred to as the "Spine Road," would be provided on the western side of the parallel runway. Due to their proximity, the Spine Road and the realigned Pulehu Road were assumed to connect across from each other on Hana Highway and form a signalized, four-way intersection.

#### 8.1.3.4 Traffic Impacts

Analyses were conducted based upon the existing laneage configuration of the study intersections. Analyses were conducted at the eight intersections studied and for the on and off-ramps of the proposed Airport Access Road interchange with Hana Highway. The intersections were analyzed using methods outlined in the 1985 Highway Capacity Manual<sup>7</sup> for signalized and unsignalized intersections, and for interchange ramps and ramp junctions.

#### Analysis Methods

The planning analysis methodology for signalized intersections uses the sum of an intersection's critical traffic volumes to determine whether the intersection may operate over, near, or under capacity. The critical traffic volumes reflect movements that conflict at an intersection such as a left-turn with the opposing through movement. It also provides a guide to determine the number of lanes that would be needed at an intersection to accommodate the projected traffic volumes.

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<sup>7</sup> Highway Capacity Manual, Special Report 209, by the Transportation Research Board, National Research Council, 1985.

The analysis methodology for unsignalized intersections determines various *Level-of-Service* (LOS) for vehicle turning movements. The LOS classification ranges from little or no traffic delay (LOS A) to extreme delays (LOS F). The ramp analyses also uses *Levels-of-Service* as an indicator of traffic delays. A description of each LOS and planning analysis category and methods are provided in the traffic report's appendix included in Appendix I.

### Signalized Intersection Analysis Results

The results of the planning analysis for signalized intersections are shown below in Table 8.1.2.

**Table 8.1.2. Planning Analysis for Signalized Intersection  
Existing Laneage Configuration**

<u>Intersection</u>	<u>1990</u>		<u>2010</u>		<u>2010</u>		<u>2010</u>	
	<u>Existing</u>		<u>Base</u>		<u>Constrained</u>		<u>Proposed</u>	
	<u>AM</u>	<u>PM</u>	<u>AM</u>	<u>PM</u>	<u>AM</u>	<u>PM</u>	<u>AM</u>	<u>PM</u>
<b>Hana Hwy. at Dairy Rd.</b>								
Capacity condition	Under	Over	Over	Over	Over	Over	Under	Over
Critical volume	1,032	1,524	3,240	3,452	3,310	3,299	1,140	1,836
<b>Kuihelani Hwy. at Puunene Ave.</b>								
Capacity condition	Under	Under	Over	Over	Over	Over	Over	Over
Critical volume	748	1,198	2,428	2,418	2,418	2,348	2,486	1,778
<b>Hana Hwy. at Haleakala Hwy.</b>								
Capacity condition	Under	Under	Over	Over	Over	Over	Near	Over
Critical volume	1,101	1,158	1,476	1,534	1,473	1,522	1,255	1,335

Source: Pacific Planning & Engineering, Inc.

The results of the planning analysis for signalized intersections are discussed below by intersection. In 2010, the demand volumes at the three signalized intersections would exceed the capacity of the existing intersections.

1. **Intersection of Hana Highway with Dairy Road**
  - Presently, this intersection operates under capacity in the morning peak hour and over capacity during the afternoon peak hour.
  - For the No Action alternatives, the intersection would operate over capacity during the morning and afternoon peak hours.
  - For the Proposed Action, the intersection would operate under capacity during the morning peak hour and over capacity in the afternoon peak hour.
  
2. **Intersection of Kuihelani Highway and Puunene Avenue**
  - Presently, this intersection operates under capacity during the morning and afternoon peak hours.
  - For the No Action and Proposed Action alternatives, the intersection would operate over capacity during the morning and afternoon peak hours.
  
3. **Intersection of Hana Highway and Haleakala Highway**
  - Presently, this intersection operates under capacity during the morning and afternoon peak hours.
  - For the No Action alternatives, the intersection would operate over capacity during the morning and afternoon peak hours.
  - For the Proposed Action, the intersection would operate near capacity in the morning peak hour and over capacity in the afternoon peak hour.

#### Unsignalized Intersection Analysis Results

The results of the unsignalized intersection analyses are shown below in Table 8.1.3.

**Table 8.1.3. Unsignalized Intersection LOS Analyses Results**  
Existing Laneage Configuration

<b>Intersection</b>	<b>1990 Existing</b>		<b>2010 Base No-Action</b>		<b>2010 Constrained No-Action</b>		<b>2010 Proposed Action</b>	
	<b>AM</b>	<b>PM</b>	<b>AM</b>	<b>PM</b>	<b>AM</b>	<b>PM</b>	<b>AM</b>	<b>PM</b>
	<b>Hana Hwy. at Haleakala Hwy.</b>							
Northbound left turn	A	E	C	E	C	E	D	E
Southbound left turn	F	C	F	B	F	D	F	B
Eastbound approach	F	F	F	F	F	F	F	F
Westbound through/left turn	E	F	F	F	F	F	F	F
Westbound right turn	A	A	B	A	B	A	B	B
<b>Hana Hwy. at Pulehu Rd.</b>								
Northbound left turn	F	E	F	F	F	F	-	-
Northbound right turn	A	C	B	D	A	D	-	-
<b>Hana Hwy. at Hansen Rd.</b>								
Westbound left turn	A	-	A	-	A	-	A	-
Northbound left turn	E	-	E	-	E	-	E	-
Northbound right turn	B	E	B	D	A	D	A	D
<b>Hana Hwy. at Kala Rd.</b>								
Eastbound left turn	C	F	B	A	B	A	B	A
Westbound left turn	A	A	A	C	A	C	A	C
Northbound approach	E	F	E	E	E	E	E	E
<b>Haleakala Hwy. at Dairy/Keolani Rds.</b>								
Northbound approach	E	F	F	F	F	F	A	A
Southbound through/left turn	C	F	F	F	F	F	A	A
Southbound right turn	A	A	A	A	A	A	A	A
Westbound left turn/through	B	E	F	F	F	F	A	A
Westbound right turn	A	A	B	A	A	A	A	A

Source: Pacific Planning & Engineering, Inc.

The results of the unsignalized intersection analyses are discussed below by intersection. Generally, the LOS for vehicle turning movements at these intersections in 2010 decreases due to longer delays caused by higher traffic volumes.

1. Intersection of Hana Highway with Haleakala Highway/Hanakai Street

- Presently, Hana Highway southbound left-turn movements and vehicles from Hanakai Street operates at LOS F during the morning peak hour. Similarly, the Hanakai Street approach and the Haleakala Highway shared left turn/through lane operates at LOS F during the afternoon peak hour. However, field observations noted that the signalized intersection of Hana Highway with Dairy Road creates gaps in traffic along Hana

Highway allowing vehicles from Hanakai Street and Haleakala Highway to execute their movements with less delays (or better LOS) than indicated by the analyses results.

- For the No Action and Proposed Action alternatives the Hana Highway southbound left-turn movement, the Hanakai Street approach, and the Haleakala Highway shared left-turn/through lane would operate at LOS F during the morning peak hour. Also, the Hanakai Street approach and the Haleakala Highway shared left-turn/through lane would operate at LOS F during the afternoon peak hour.

2. Intersection of Hana Highway with Pulehu Road

- Presently, the Pulehu Road left-turn movement operates at LOS F during the morning peak hour, but operates at LOS E during the afternoon peak hour.
- For the No Action alternatives, the Pulehu Road left-turn onto Hana Highway would operate at LOS F during the morning and afternoon peak hours.

- For the Proposed Action, the Hana Highway-Pulehu Road intersection will be relocated to a new four-way intersection of Hana Highway and Pulehu Road/East Ramp Access Road.
3. Intersection of Hana Highway with Hansen Road
    - Presently, none of the permitted movements at this intersection experience over capacity traffic conditions (LOS F).
    - For the No Action and Proposed Action alternatives, the permitted vehicle movements would continue to operate under capacity, at LOS E or better.
  4. Intersection of Hana Highway with Kala Road
    - Presently, only the Hana Highway eastbound left-turn movement and Kala Road northbound approach operate at LOS F conditions during the afternoon peak hour.
    - For the No Action and Proposed Action alternatives, all movements at this intersection would experience LOS E or better during the morning and afternoon peak hours.
  5. Intersection of Haleakala Highway/Dairy Road with Keolani Place
    - Presently, the Haleakala Highway northbound approach and the southbound shared lane for through and left-turn vehicle movements operate at LOS F during the afternoon peak hour.
    - For the No Action alternatives, LOS F conditions would be experienced by the Haleakala Highway northbound approach and the southbound shared lane for through and left-turn movements during the morning and afternoon peak hour. The LOS for Keolani Place shared left/through lane vehicle movements would also drop to LOS F during both peak hours.
    - For the Proposed Action, all movements would operate at LOS A during the morning and afternoon peak hours.

**Ramps and Ramp Junctions**

Ramp analyses were conducted for the Airport Access Road Interchange with Hana Highway in the Proposed Action alternative. The layout of the Airport Access Road Interchange with Hana Highway used in the analysis is shown in Figure 19 of the traffic study (see Appendix I). Except for the Hana-to-Lahaina on-ramp which would be at LOS E in the morning peak hour, the results of the ramp analyses show the ramp and freeway would be at LOS D or better during the morning and afternoon peak hours. Table 8.1.4 provides the results of the ramp analyses.

**Table 8.1.4. Airport Access Road Interchange Ramp Analyses, Year 2010**

	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>Ramp</u>	<u>Freeway</u>	<u>Ramp</u>	<u>Freeway</u>
<b>Airport Access Road Ramp Analyses</b>				
<b><u>On-Ramp</u></b>				
Hana-to-Lahaina	E	B	C	B
Kahului-to-Lahaina	C	C	B	B
Kahului-to-Airport	A	B	A	B
Hana-to-Airport	A	B	A	B
<b><u>Off-Ramp</u></b>				
Lahaina-to-Hana	A	B	B	B
Airport-to-Kahului	A	B	A	B
<b>Hana Highway Ramp Analyses</b>				
<b><u>On-Ramp</u></b>				
Lahaina-to-Hana	A	B	D	D
Airport-to-Kahului	A	B	A	B
<b><u>Off-Ramp</u></b>				
Hana-to-Lahaina	B	D	A	B
Kahului-to-Lahaina	A	B	B	C
Kahului-to-Airport	A	B	B	C
Hana-to-Airport	C	D	B	B

Source: Pacific Planning & Engineering, Inc.



#### 8.1.4 POTENTIAL MITIGATION MEASURES

Traffic volumes in the vicinity of the Airport are expected to increase whether or not the Kahului Airport improvements are implemented. The LRHP provides guidelines for the travel lanes needed in the future to accommodate the projected regional growth. However, analyses of the intersections indicate that additional mitigation measures would be needed to accommodate vehicle turning movements at the intersections.

The Airport Access Road would provide a new route to the Airport terminal and alleviate the need to provide additional travel lanes at the intersection of Hana Highway with Dairy Road.

While Haleakala Highway would be bisected by the Airport Access Road near Kahului Airport, possible mitigative measures to surrounding intersections described below would create increased capacity to accommodate the rerouted traffic. Furthermore, the existing Haleakala Highway/Keolani Place access to Kahului Airport should be maintained so that traffic to and from the Kahului/Wailuku region have alternative routes to the Airport.

The elimination of the Haleakala Highway access to the east ramp areas, due to the parallel runway, would improve the traffic conditions at the intersection of Hana Highway and Haleakala Highway so that no additional laneage would be needed at this intersection. The Spine Road connection to Hana Highway should be designed to intersect the highway directly across from the realigned Pulehu Road.

Traffic impacts resulting from increased volumes due to regional growth, which includes airport-related traffic, could be mitigated in various ways. Two possible methods are suggested below and are described in greater detail by intersection:

1. Non-Diversion of Traffic - Increase roadway and/or intersection capacity to accommodate the projected traffic volumes at the study intersections by adding laneage and/or traffic signals.
2. Diversion of Traffic - As traffic volumes increase, motorists could divert to lesser used or proposed routes which would decrease the extent of improvements to the existing regional highway system.

#### Intersection of Hana Highway and Dairy Road

1. *Non-Diversion of Traffic*

The southbound approach on Hana Highway would need three through lanes with optional right-turns and a separate left-turn lane. The Dairy Road eastbound approach would require a separate left-turn lane, a shared lane for left-turns and through movements, and a separate right-turn lane.

2. *Diversion of Traffic*

Except for the Dairy Road eastbound approach, the remaining approaches would remain the same as the existing configuration. For the Dairy Road eastbound approach, a separate left-turn, a shared left-turn/through lane, and a separate right-turn lane would be needed.

#### Intersection of Kuihelani Highway and Puunene Avenue

1. *Non-Diversion of Traffic*

For the Kuihelani Highway east and westbound approaches, three through lanes in each direction with optional right-turns and a separate left-turn lane would be needed.

2. *Diversion of Traffic*

Four travel lanes, two in each direction, should be provided on Kuihelani Highway and Puunene Avenue. All approaches at this intersection would require a separate left-turn lane. In addition, the Kuihelani Highway westbound approach and the Puunene Avenue northbound approach would need a separate right-turn lane.

Intersection of Hana Highway and Haleakala Highway

1. *Non-Diversion of Traffic*

The existing laneage at this intersection would be sufficient to serve the forecasted demand traffic volumes. The west leg of this intersection would be eliminated due to the construction of the parallel runway.

2. *Diversion of Traffic*

The existing laneage at this intersection would be sufficient and traffic would not need to divert from this intersection. The west leg of this intersection would be eliminated due to the construction of the parallel runway.

Intersection of Hana Highway with Haleakala Highway/Hanakai Street

1. *Non-Diversion of Traffic*

Additional laneage would not be required, but the intersection may need to be signalized.

2. *Diversion of Traffic*

The existing laneage would be adequate, but traffic signals may be needed at this intersection.

Intersection of Hana Highway and Pulehu Road

1. *Non-Diversion of Traffic*

The intersection would need a minimum of two eastbound travel lanes and three westbound travel lanes with separate left and right-turn lanes for all approaches. All turning movements would be allowed during the morning and afternoon peak hours, and traffic signals should be provided. Separate right-turn lanes on Pulehu Road and a Spine Road would minimize delays for right-turn movements on these approaches.

2. *Diversion of Traffic*

On Hana Highway four travel lanes, two lanes in each direction, would be required. Separate left and right-turn lanes should be provided at each approach as appropriate, and traffic signals would also be needed. The traffic delays to right-turn movements from Pulehu Road and the Spine Road would be minimized if separate right-turn lanes are provided for these cross street approaches.

Intersection of Hana Highway and Hansen Road

1. *Non-Diversion of Traffic*

Only right-turn movements in and out of Hansen Road should be permitted at this intersection. Left-turns onto or from Hana Highway could be executed from the improved signalized Pulehu Road intersection.

2. *Diversion of Traffic*

As described above, only right-turn movements in and out of Hansen Road should be permitted at this intersection. Left-turns onto or from Hana Highway could be executed from the improved signalized Pulehu Road intersection.

Intersection of Hana Highway and Kala Road

1. *Non-Diversion of Traffic*

The west leg of this intersection would be eliminated due to construction of the parallel runway. Elimination of the west approach would not affect the laneage requirements for the remaining approaches.

2. *Diversion of Traffic*

The west leg of this intersection would be eliminated due to construction of the parallel runway. Elimination of the west approach would not affect the laneage requirements for the remaining approaches.

Intersection of Haleakala Highway, Dairy Road and Keolani Road

1. *Non-Diversion of Traffic*

All-way stop controls would be adequate for this intersection and no additional laneage would be needed. Realignment of this intersection should be considered to improve the poor geometrics of this intersection.

2. *Diversion of Traffic*

All-way stop controls would be adequate with the existing laneage. Realignment of this intersection should be considered to improve the poor geometrics of this intersection.

## 8.2 HARBORS

### 8.2.1 EXISTING CONDITIONS

Kahului Harbor is one of eight commercial harbors in the State of Hawaii Harbor System and is located along the northern shore on the windward side of Maui. The Harbor is located approximately 1.5 miles to the west of Kahului Airport and approximately 2 miles to the east of Wailuku. It is the only commercial deep-draft harbor serving ocean cargo shipping for Maui, and is the second busiest port in the State.

Present weekly scheduled users of the overseas facilities are interisland container operations, passenger cruise ships, and fuel barges. Berths at this pier are occupied most of the time by these vessels and occasionally vessels have to wait outside the harbor until space opens. The frequency of vessels entering/exiting the harbor has increased from once a week to twice a week causing some berthing conflicts. Each vessel stays an average of 1 to 3 days.

State Department of Transportation, Harbors Division personnel have expressed concerns about the shipment of rental cars arriving and departing Kahului Harbor. The steady flow of rental cars affects the Harbor's operations by taking up storage space and increasing traffic congestion.

## 8.2.2 PROBABLE IMPACTS

### No-Action Alternatives

The expected increase in resident, visitor and Airport activities will increase activity at the Harbor. Increased fuel needs for Airport and non Airport-related activities will increase the need for fuel barge shipments and increase the potential for fuel spills during shipping and at the Harbor.

The total number of aircraft operations is projected to increase from 177,803 aircraft operations in 1989 to 263,500 aircraft operations in 2010 under the Base No-Action Scenario, and 241,700 aircraft operations under the Constrained No-Action Scenario. The increased number of aircraft operations and corresponding airline fuel consumed will result in an increase in the number of fuel barges entering the Harbor creating additional demand for a fixed number of berthing spaces. The expected increase in visitors through the Airport should result in a similar increase in rental car operations, thereby increasing the volume of rental cars arriving/departing from Kahului Harbor. If Kahului Harbor is unable to store the increased number of rental cars, the rental cars could be stored outside of the Harbor area. For the Constrained No-Action Scenario, up to eight percent fewer aircraft operations, airline fuel consumed and number of fuel barges may occur, and up to ten percent fewer rental car operations in the Harbor area may occur .

To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in non Airport-related activity at the Harbor would occur.

Proposed Action

Increased fuel needs for Airport and non Airport-related activities will increase the need for fuel barge shipments and increase the potential for fuel spills during shipping and at the Harbor. The total number of aircraft operations is projected to increase from 177,803 aircraft operations in 1989 to 306,000 aircraft operations in 2010 for the Proposed Action. The Proposed Action is expected to increase airline fuel consumption and number of fuel barges by 14 percent, but not increase the volume of rental cars in the Harbor area compared to the Base No-Action Scenario. Compared to the Constrained No-Action Scenario, airline fuel consumption and number of fuel barges may increase by up to 21 percent, and the volume of rental cars in the Harbor area may increase by up to ten percent with the Proposed Action.

The amount of non Airport-related activity at the Harbor would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in non Airport-related activity at the Harbor would occur.



## 8.3 WATER SUPPLY

### 8.3.1 EXISTING CONDITIONS

The County Department of Water Supply (DWS) administers and operates five separate municipal water systems on the island of Maui, one of which is the Central Maui Water System. The Central Maui Water System serves most of the urban and rural areas of Wailuku-Kahului including Kahului Airport, Kihei-Makena, and smaller urban portions of Paia. The Central Maui Water System is made up of four aquifers which are the Kahakuloa, Waihee, Waikapu and Iao aquifer systems.

The Iao Aquifer System presently supplies potable water to Central Maui, and has an estimated sustainable yield of 20 million gallons per day (mgd). According to the County DWS, the Iao Aquifer had an 87 percent average daily withdrawal rate (17.4 mgd) over a recent 12 month period. This current withdrawal represents an increase from the 1987 average withdrawal of 15.1 mgd reported in The Maui County Water Use and Development Plan Technical Report, December 1989 (Water Development Plan).

Based upon the Water Development Plan, the 1987 average daily potable water withdrawal rates for the Wailuku-Kahului area was 7.7 mgd, the Kihei-Makena area was 7.1 mgd, and portions of Paia was 0.4 mgd. Within the Wailuku-Kahului district, the Kahului-Spreckelsville area accounted for 4.5 mgd or 59 percent of the total average daily withdrawal from the region. Compared with the total potable water withdrawal from the Iao Aquifer, the Kahului-Spreckelsville area accounted for 30 percent of the total.

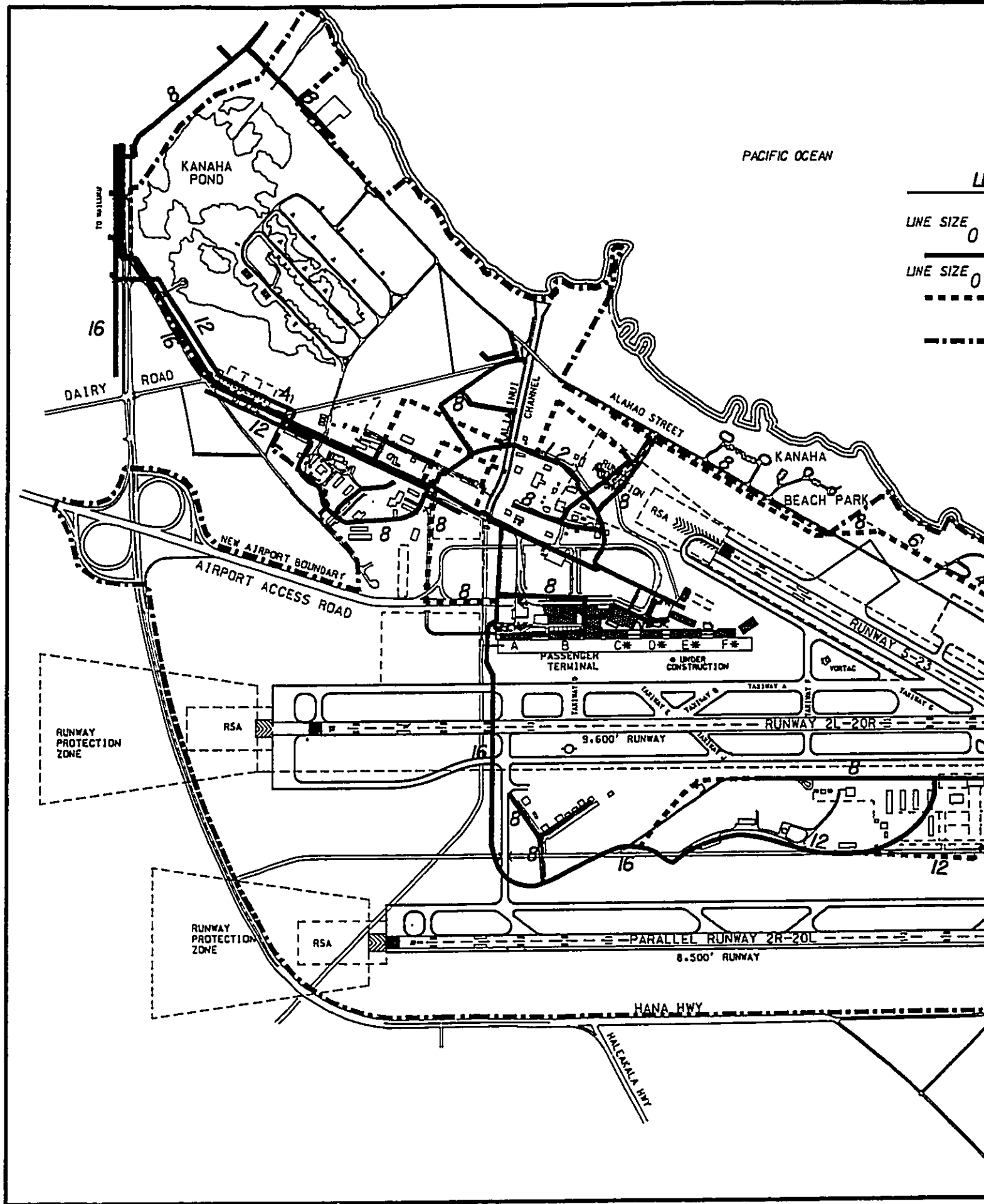
### 8.3.1.1 Existing Kahului Airport Water Demand

At Kahului Airport, water is used for drinking, restaurants, restrooms, rental car washing, and landscape irrigation. The Airport's water usage is approximately 0.3 mgd of potable water based upon a review of water bills between September, 1990 and February, 1991. DOT maintenance personnel estimate approximately 25 percent of the potable water is currently used for landscaping and existing construction.

### 8.3.1.2 Kahului Airport Water System

The existing water system serving Kahului Airport and associated land uses within the Airport boundary are shown on Figure 8.3.1. The water system generally serves the Airport's passenger terminal building and commuter terminal areas, facilities located on the East Ramp, the ground transportation subdivision, and light industrial and commercial activities operating within the Airport boundary area.

The Airport water system is made up of a network of pipelines ranging between 6 and 16 inches which connect to a 16 inch main line running along Hana Highway. The existing water lines are maintained by the County DWS. A recent addition to the water system is a 16-inch waterline running from Eena Street, along Haleakala Highway and Keolani Place and connecting with the main line along Hana Highway. Other water system additions are 12-inch and 8-inch waterlines at Halai Street and Kaonawai Place, and a 16-inch waterline extension from the Keolani Place bridge to the Airport terminal entrance. Water line additions to the Airport water system are constructed by the State and maintained by the County DWS.



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PACIFIC OCEAN

**LEGEND**

- LINE SIZE 0  
————— EXISTING LINES
- LINE SIZE 0  
- - - - - POSSIBLE FUTURE LINES
- FUTURE AIRPORT BOUNDARY

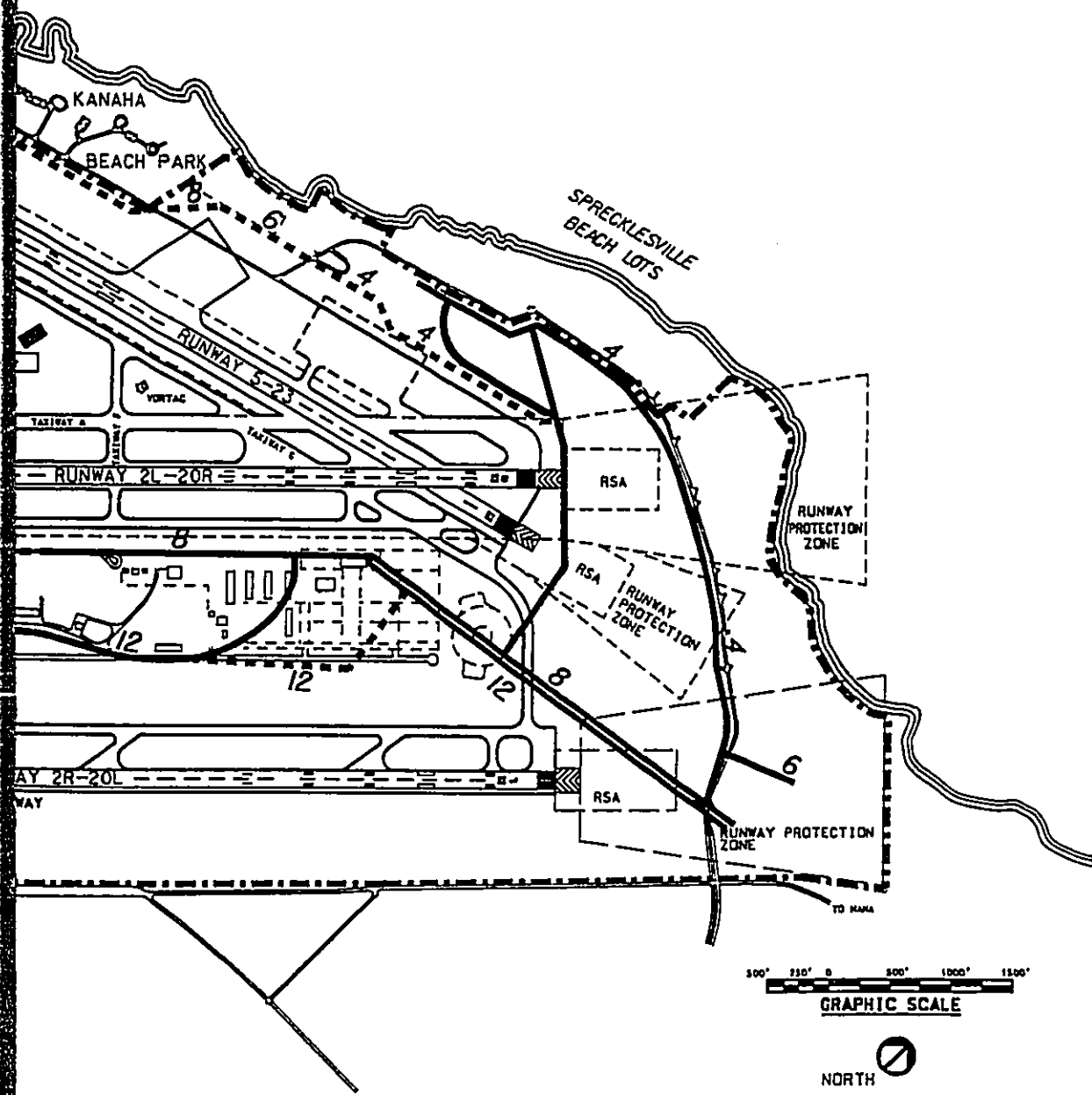


FIGURE 8.3.1

PROJECT TITLE:

KAHULUI  
AIRPORT  
E.I.S.

PROJECT NO.:

SHEET TITLE:

WATER  
SYSTEM

JULY 1992

FIG. 8.3.1

Sections of the existing water system serving the Airport's terminal area, East Ramp facilities, and GTS were installed several decades ago during World War II. DOT maintenance personnel report some leakage problems with portions of the older water lines that have deteriorated over the years. The maintenance personnel suspect leakages from water lines located in the undeveloped area west of the GTS based upon previous visual inspections. The extent of the leakages and their specific locations are very difficult to determine and repair because of the thick brush and keawe tree growth in the area. Maintenance work on the General Aviation and other East Ramp areas are also difficult due to the deteriorated condition of the lines.

### 8.3.2 PROBABLE IMPACTS

#### No-Action Alternatives

Water demand at Kahului Airport including rental car operations generally corresponds with passenger activity levels at the Airport. Currently, the Airport terminal demand is estimated to be approximately 15 gallons of water per day per passenger (gppd). This water demand rate is similar to Honolulu International Airport's Terminal demand of 15 gppd<sup>8</sup> and is, therefore, considered to be a reasonable rate to project future water demand.

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<sup>8</sup> "Honolulu International Airport Utilities Evaluation," prepared by Wilson Okamoto & Associates, 1990.

Using the above 15 gppd water demand rate and passenger forecasts described in Section 4.0, Kahului Airport's water demand is projected to increase from 0.3 mgd in 1991 to 0.6 mgd in 2010 under the Base No-Action Scenario, and 0.54 mgd compared to the Constrained No-Action Scenario. These projected water demands conservatively assume continued use of potable water for airport landscaping purposes. It is expected that off-Airport facilities for flight kitchen and commercial development activities could be developed to service the increased needs at the Airport. If these off-Airport facilities are provided, they would also draw water from the Central Maui Water System.

To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in water demand outside of the Airport would occur.

#### Proposed Action

The Proposed Action is not expected to increase water demand (Base No-Action Scenario). Compared to the Constrained No Action Scenario, water demand may increase by up to 0.06 mgd with the Proposed Action. Water demand would not change significantly for on-Airport flight kitchen and commercial development facilities because these facilities could have been provided off-Airport and supplied with essentially the same amount of water under the No Action Alternatives.

The water demand outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in water demand outside of the Airport would occur.

### 8.3.3 POTENTIAL MITIGATION MEASURES

Potential mitigation measures to manage water consumption include: using non-potable water for airport landscaping; replacing existing landscaping with plants that require less irrigation; limiting current and future Airport landscape areas; recycling rental car wash water; restricting washing of aircraft or rental cars; limiting firefighting training sessions; and replacing deteriorated water lines to reduce water leakage losses. The County DWS recently purchased a high-tech listening device to detect leaks in underground waterlines. The detection and repair of waterlines will help to reduce the County's water leakage losses of approximately 13 percent of all water pumped<sup>9</sup>.

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<sup>9</sup> "Officials Plan To Tap Into East Maui Water," The Maui News, April 12, 1991

## **8.4 WASTEWATER TREATMENT AND DISPOSAL**

### **8.4.1 EXISTING CONDITIONS**

#### **8.4.1.1 Wailuku-Kahului Wastewater Reclamation Facility**

The Wailuku-Kahului Wastewater Reclamation Facility (WRF) is the County's primary wastewater treatment facility serving the Central Maui area. Constructed in 1979, the WRF is located along Alahao Street northwest of Kahului Airport between Kahului Harbor and Kanaha Beach Park.

The Wailuku-Kahului WRF is a secondary, activated-sludge treatment facility having a current design capacity of 6 mgd. Effluents from the WRF are disposed of via a series of four injection wells located makai of the facility. In addition to the wells, the WRF has a storage pond available to accommodate peak flows.

Current plans by Maui County's Department of Public Works are to upgrade the Wailuku-Kahului WRF by increasing its processing capacity to 7.9 mgd at a cost of approximately \$8 million. Subject to available funding, the improvements are planned to be completed by late 1992. Once the improvements are completed, the facility is not expected to be expanded in the future due to its location in a tsunami inundation zone and the high corrosion maintenance costs near the ocean.

The County Department of Public Works is currently working on a Master Plan addressing future sewage demands and facility requirements for servicing Central Maui. The Master Plan is studying possible alternatives which involve the development of either one large sewage plant or two smaller plants.



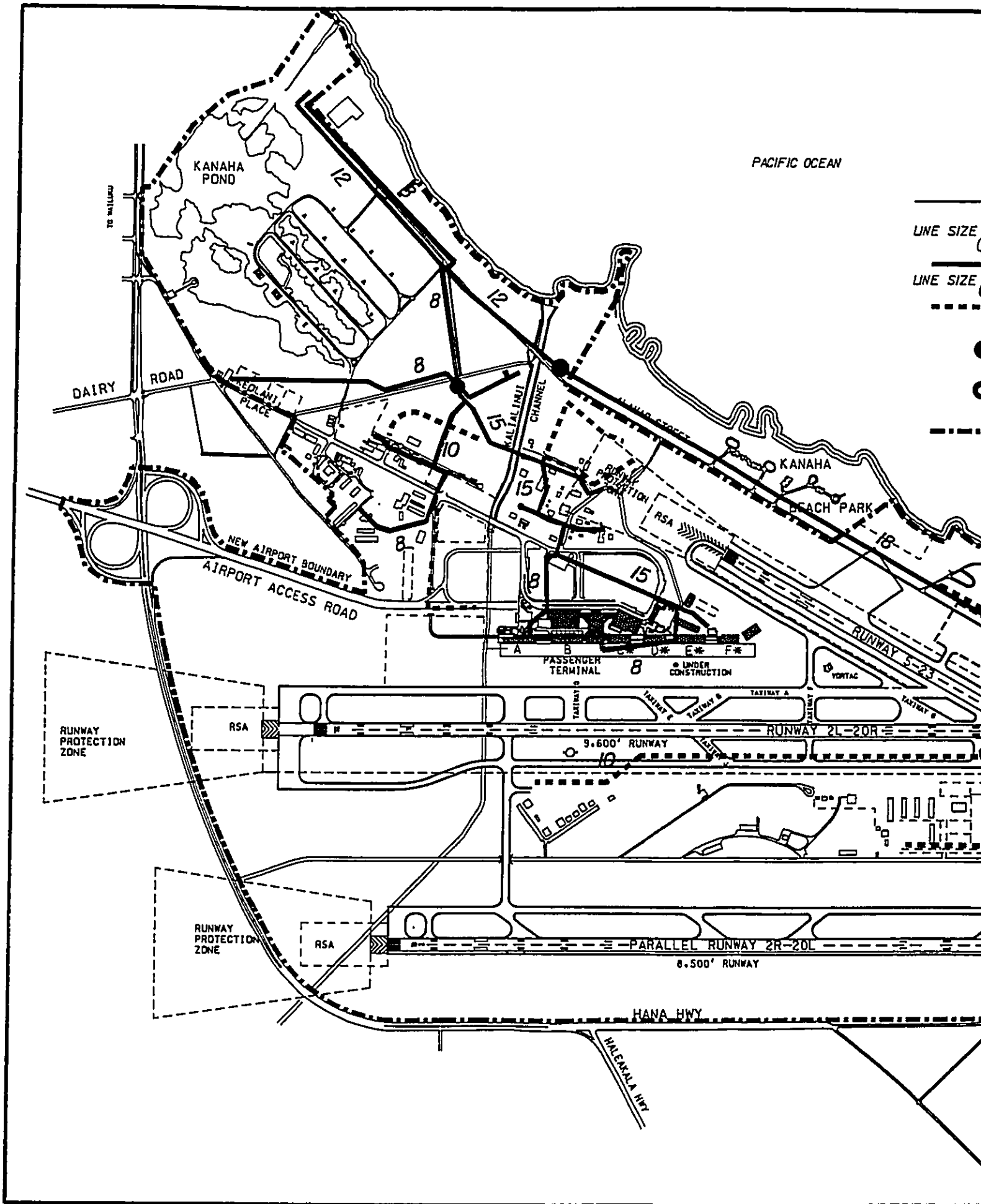
#### 8.4.1.2 Airport Sewage System

The existing sewerage system within the Airport boundary, shown on Figure 8.4.1, is owned by the State of Hawaii, but operated and maintained by the County of Maui. The Airport sewerage system currently serves the Airport's main passenger terminal and commuter terminal areas, the Ground Transportation Subdivision (GTS), and light industries operating within the Airport boundary area.

Sewage from these areas are collected by a sewerline system consisting of 8, 10, and 15-inch lines which convey it to the NASKA sewage pump station located near the eastern boundary of Kanaha Pond. The sewage is then pumped to the Wailuku-Kahului WRF via an 8 inch force main which runs alongside Alahao Street.






Portions of the Airport sewer collection system serving the terminal area and GTS were installed several decades ago during World War II when Kahului Airport was under the control of the U.S. Navy. Discussions with DOT maintenance personnel and a visual inspection of undeveloped areas to the west of the GTS indicate these older abandoned sewer lines feed into existing main sewer lines. The World War II sewer lines are not shown on Figure 8.4.1 because their specific locations are not known due to the excessive growth of brush and keawe trees in the area.

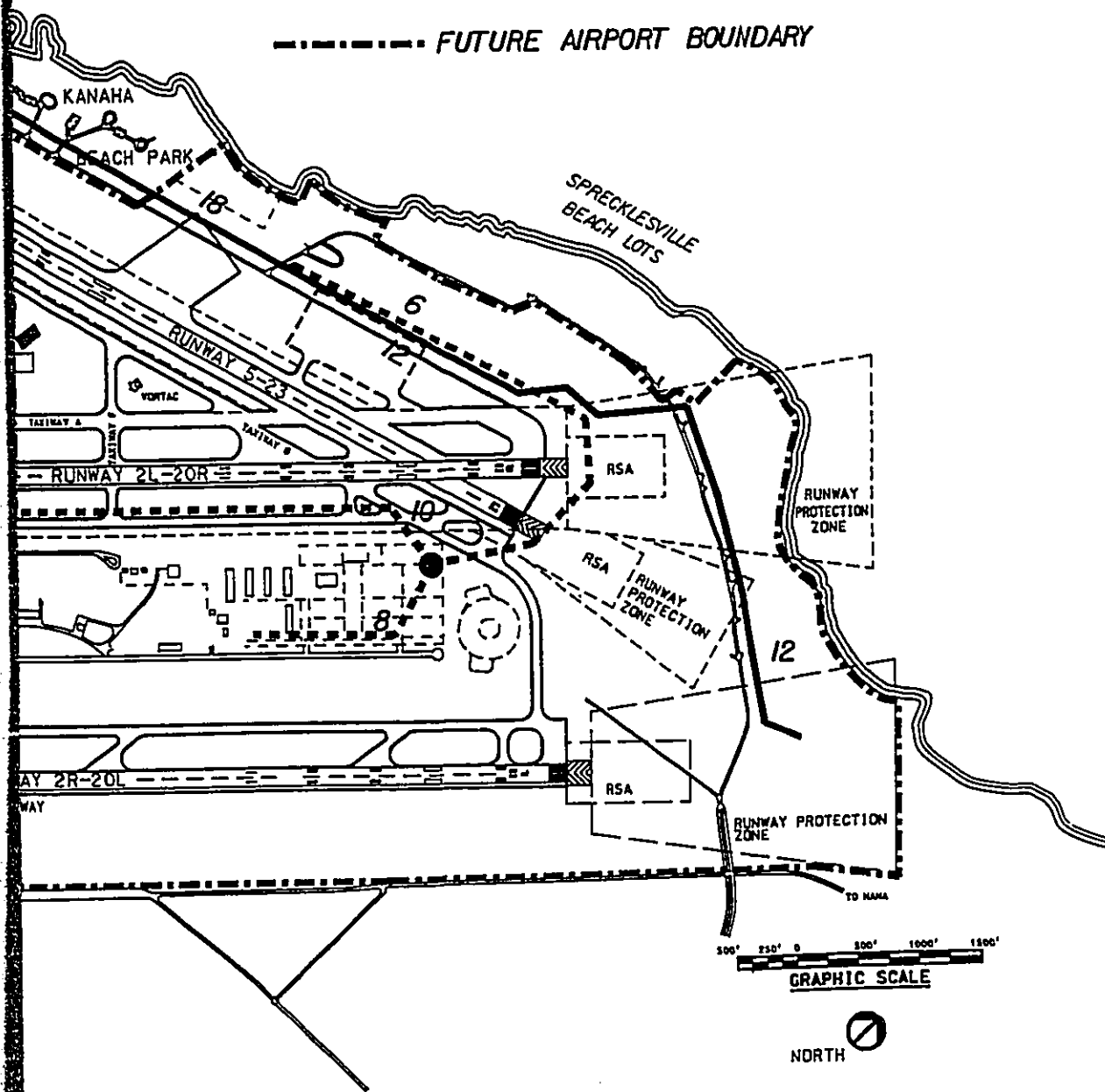
Previous maintenance work performed on these older sewer lines have found sections of the lines to be deteriorated with sewage sediments creating a natural encasing for the deteriorated section. Portions of the older lines were found to be cracked and exposed to the surface because they were installed relatively close to the surface years ago. Visual inspections have also found certain manholes associated with these older sewer lines to be damaged with cracks exposing the manholes to rain infiltration.



PACIFIC OCEAN

**LEGEND**

- LINE SIZE 0  EXISTING LINES
- LINE SIZE 0  POSSIBLE FUTURE LINES
-  EXISTING PUMP STATION
-  POSSIBLE FUTURE PUMP STATION
-  FUTURE AIRPORT BOUNDARY



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FIGURE 8.4.1

PROJECT TITLE:

KAHULUI  
AIRPORT  
E.I.S.

PROJECT NO.:

SHEET TITLE:

SEWERAGE  
SYSTEM

DATE:  
JULY 1992

SHEET NO.:

The General Aviation and Helicopter facilities on the East Ramp are currently served by cesspools. A sewerline system previously serving these facilities was abandoned many years ago and is not shown on Figure 8.4.1.

A County 12 inch sewer force main runs along Spreckelsville Beach Road and the northern area of Runway 2-20 before connecting with an 18-inch gravity flow line running along Alahao Street to the Wailuku-Kahului WRF. This line generally serves the areas of Spreckelsville, Paia and Kuau town.

The NASKA Pump Station was constructed in the early 1980's and serves the entire airport property including the Airport industrial area and GTS. The pump station is equipped with two wells (wet and dry) located underground which receive sewage from the sewerlines using gravity flow. The pump station is also equipped with an emergency generator, and the rated capacity of the pump station is 800 gallons per minute (gpm).

#### 8.4.1.3 Existing Airport Sewage Flow

Table 8.4.1 summarizes data compiled by the County Department of Public Works, Waste Management Division (WMD) on the average daily sewage flows from the NASKA Pump Station to the Wailuku-Kahului WRF for 1989 and 1990. The pump station's average daily sewage flow for the two year period was 245,000 gallons per day (gpd).

Personnel from the County WMD, Wailuku-Kahului WRF, and Kahului Airport have expressed concerns about excessive water infiltration into the Airport sewer system when heavy rains occur. A review of estimated Airport water usage and historical NASKA pump station sewage flow data indicate that daily sewage flows can increase by up to 170,000 gpd from water infiltration during occasional periods of very heavy rains.

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Table 8.4.1. NASKA Pump Station Sewage Flows

<u>Month</u>	<u>Average Daily Flows in Gallons</u>	
	<u>1989</u>	<u>1990</u>
January	253,000	268,900
February	284,400	261,200
March	287,800	314,700
April	434,100*	222,900
May	255,600	176,100
June	241,800	191,000
July	222,900	185,900
August	225,300	201,100
September	227,400	190,700
October	243,900	208,500
November	226,900	258,600
December	<u>249,800</u>	<u>251,900</u>
Average Daily Flow for Year	262,740	227,630
2 Year Average Daily Flow	245,185	

\*Note: Heavy rains during month

Source: County Public Works, Waste Management Division

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#### 8.4.2 PROBABLE IMPACTS

The significance of sewage impacts resulting from the Proposed Action were assessed on the basis of increased sewage generation and the ability of County water reclamation facilities to accommodate the increase.

### No-Action Alternatives

Sewage generated by Kahului Airport including rental car operations generally correspond with passenger activity levels at the Airport. A review of water consumption data for the new passenger terminal building and sewage flows from the NASKA pump station for the same periods indicated a good correlation between the two. As a result, the projected water demands for Kahului Airport and rental car companies located within the Airport property (inflows) were determined to be reasonable estimates for future sewage generation (outflows) in 2010.

Sewage generated by Kahului Airport's operations is projected to increase from 0.25 mgd in 1991 to 0.5 mgd in 2010 under the Base No-Action Scenario, and 0.45 mgd under the Constrained No-Action Scenario. The Wailuku-Kahului WRF currently processes approximately 5.3 mgd and is planned to be expanded to 7.9 mgd which could accommodate the projected increase in sewage from Kahului Airport.

The NASKA pump station currently pumps sewage at the rate of approximately 445 gpm, and has the capacity to pump up to 800 gpm. Based upon projected sewage flows in 2010, the NASKA pump station should be able to accommodate the projected increased sewage flows from the Airport with longer operating hours. It is expected that off-Airport facilities for flight kitchen and commercial development activities could be developed to service the increased needs at the Airport. If these off-Airport facilities are provided, they would also generate sewage.

To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in sewage generated outside of the Airport would occur.

### Proposed Action

The Proposed Action is not expected to increase the amount of sewage generated (Base No-Action Scenario). Compared to the Constrained No-Action Scenario, the amount of sewage generated may increase by up to 0.05 mgd with the Proposed Action. The amount of sewage generated would not change significantly for on-Airport flight kitchen and commercial development facilities because these facilities could have been provided off-Airport under the No-Action Alternatives and generated the same amount of sewage.

The amount of sewage generated outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in sewage generated outside of the Airport would occur.

#### 8.4.3 POTENTIAL MITIGATION MEASURES

Deteriorated, abandoned, or broken sewer lines and manholes in the undeveloped area to the west of Kalialinui Gulch and other airport locations should be replaced or blocked as needed to decrease water infiltration into the sewer collection system.

## 8.5 SOLID WASTE COLLECTION AND DISPOSAL

### 8.5.1 EXISTING CONDITIONS

There are currently four landfills operating on Maui which are the Central Maui, Olowalu, Makani, and Hana Landfills. All of the landfills are operated by the County Department of Public Works. Another landfill, the Waikapu Landfill, has been closed and the closure of the Olowalu and Makani Landfills are imminent.

#### 8.5.1.1 Central Maui Landfill

The Central Maui Landfill (CML) is located approximately four miles southeast of Kahului Airport in a Puunene quarry site. The landfill opened in 1987 and encompasses 55 acres of land. The landfill site is underlain by brackish basal water and located down gradient and far removed from any groundwater sources used for domestic water supply. The nearest municipal wells are located upgradient from the landfill about seven miles northwest near Wailuku.

The 1989 County of Maui Comprehensive Solid Waste Management Plan reported that 55 percent of the total rubbish entering the landfill is generated from Central Maui which includes the areas of Wailuku, Kahului, Waiehu, Paia, Waikapu, and Puunene. South Maui (Kihei and Wailea) contributed 17 percent, West Maui (Lahaina, Honokowai, Kaanapali, and Kapalua) 21 percent, and Upcountry Maui 8 percent.

The CML was designed to serve as the principal landfill for Maui enabling the closure of other landfills that have already exceeded their design capacity. The County has designated this landfill as the disposal site for all County and commercial waste with the exception of Hana due to its remoteness. The landfill accepts commercial waste from private haulers, residential waste from County trucks, sludge from the County's three sewage treatment plants, construction debris, industrial waste, and automobile hulks. Hazardous waste is not accepted at the landfill.



The use of the CML as the primary landfill for Maui has resulted in an increase in waste received at the site. Although the CML was planned to have a useful life of 12 years, a 1988 County waste quantity and composition survey showed that the landfill was being filled at a faster rate resulting in an expected life of seven years. The survey measured an average daily waste stream flow of 640 tons per day (tpd) indicating the landfill is expected to be at capacity by 1994.

#### 8.5.1.2 Existing Kahului Airport Waste Generation

Based upon the quantity and composition survey, approximately 349 tpd of waste is generated from the Central Maui region. Kahului Airport, including rental car companies, generate an estimated 3.5 tpd or one percent of the total Central Maui waste based upon discussions with private disposal companies and a review of existing airport refuse collection data.

#### 8.5.2 PROBABLE IMPACTS

Solid waste impacts resulting from the Proposed Action were assessed on the basis of increased waste quantities, and the ability of private companies and County facilities to accommodate the increase.

##### No-Action Alternatives

Solid waste generated by Kahului Airport including rental car operations, were assumed to generally correspond with passenger activity levels at the Airport. Estimates of current solid waste generated by Kahului Airport including rental car companies, were compared with existing passenger activity, and projected for 2010 using the passenger forecasts described in Section 4.0.

Using this method, the solid waste generated by Kahului Airport operations is projected to increase from 3.5 tpd in 1991 to 6.5 tpd in 2010 under the Base No-Action Scenario, and 5.7 tpd under the Constrained No-Action Scenario. The County Comprehensive Solid Waste Management Plan waste projections for commercial activities on Maui show an increase from 260 tpd in 1990 to 430 tpd in 2010. Based upon this information, Kahului Airport is expected to continue to contribute about one percent of the daily solid waste generated by commercial activities on Maui.

Private disposal companies were assumed to continue providing solid waste collection services for Kahului Airport. It is expected these private disposal companies will accommodate the projected increase in airport solid waste, and the County collection system will therefore not be affected. It is expected that off-Airport facilities for flight kitchen and commercial development activities could be developed to service the increased needs at the Airport. If these off-Airport facilities are provided, they would also generate solid waste.

To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in solid waste generated outside of the Airport would occur.

#### Proposed Action

The Proposed Action would generate solid waste during construction of the airport improvements. The Proposed Action is not expected to increase the amount of solid waste generated by Airport operations (Base No-Action Scenario). Compared to the Constrained No-Action Scenario, the amount of solid waste generated by Airport operations may increase by up to 0.8 tpd with the Proposed Action. The amount of solid waste generated would not change significantly for on-Airport flight kitchen and commercial development facilities because these facilities could have been provided off-Airport under the No-Action Alternatives and generated the same amount of solid waste.

The amount of solid waste generated outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in solid waste generated outside of the Airport would occur.

The County of Maui currently does not have a waste reduction program, however, the County Department of Public Works, Solid Waste Division requests land owners to implement waste reduction and recycling programs. Similarly, the Airport could initiate waste reduction and recycling programs to reduce the impacts from solid waste.

## 8.6 POWER AND COMMUNICATIONS

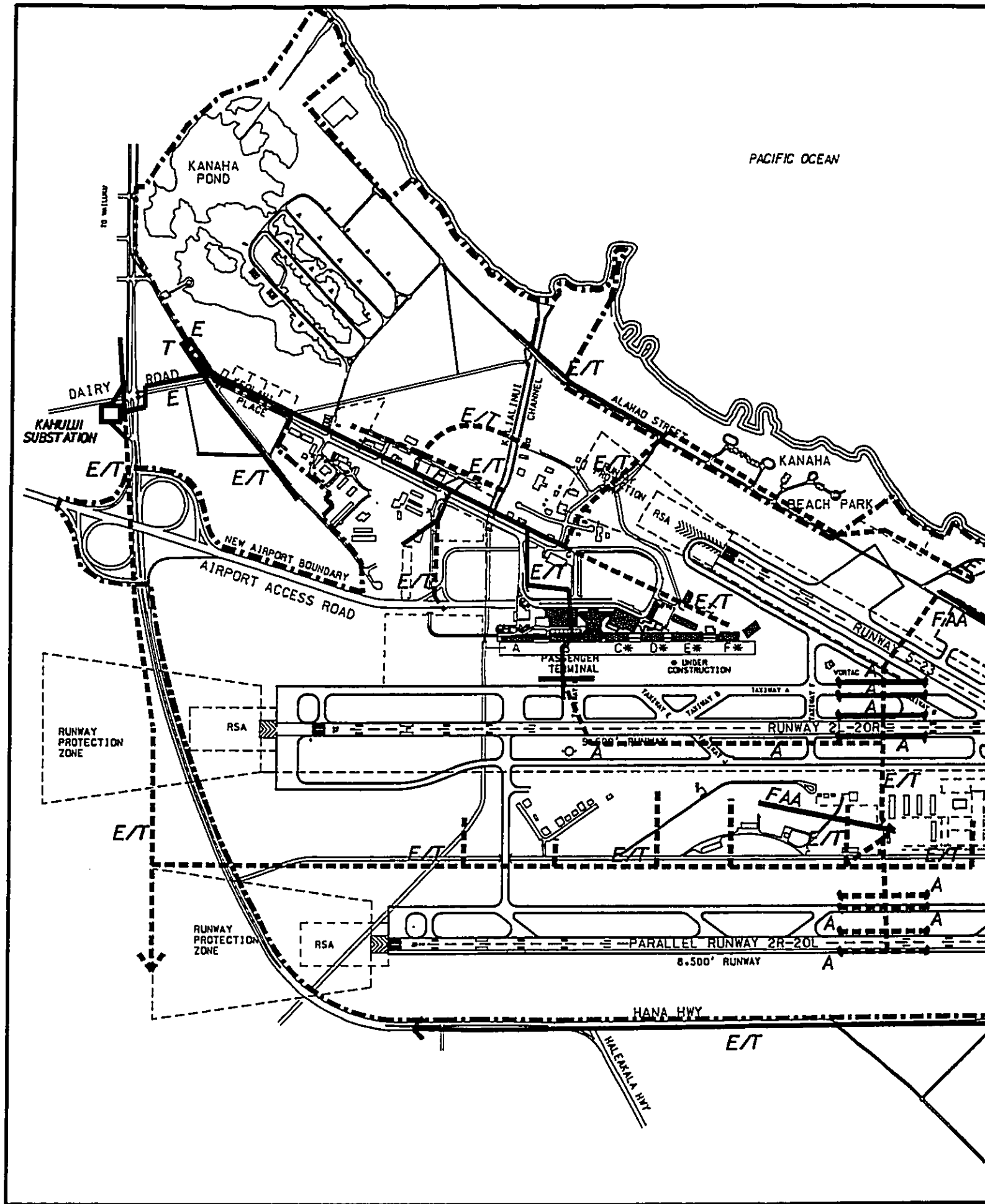
### 8.6.1 EXISTING CONDITIONS

#### 8.6.1.1 Electrical System

Maui Electric Company, Limited's (MECO) Kanaha Substation #2, located at the intersection of Hana Highway and Dairy Road, has a transformer capacity of 7,500 kVA. The substation currently provides most of the electrical power to Kahului Airport. A recent check of the transformer's operation by MECO indicated the transformer is operating at 86 percent of capacity (6,450 kVA), with approximately 25 percent of the current demand (1,612 kVA) utilized by the Airport.

Kahului Airport currently has two 2,000 kVA substations which were installed in the recently completed Passenger Terminal Building Phase I, Unit I. The State owned substations have their own switchgears and transformers and are located under Holdroom B.

Kahului Airport facilities receive electrical power from MECO via two 12.47 kV 3-phase distribution lines, and one 4.16 kV 3-phase distribution line. Figure 8.6.1 shows the electrical power distribution system for the Airport. The 12.47 kV distribution lines are fed from MECO's Kanaha Substation #2 while the 4.16 kV distribution line originates from MECO's Paia Substation.



AIRPORTS DIVISION  
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LEGEND

- FUTURE AIRPORT BOUNDARY
- EXISTING LINES
- POSSIBLE FUTURE LINES
- E/T — POWER/TELEPHONE LINE
- E — POWER LINE
- T — TELEPHONE LINE
- FAA — FAA COMMUNICATIONS LINE
- A — AIRFIELD LIGHTING LINE

PACIFIC OCEAN

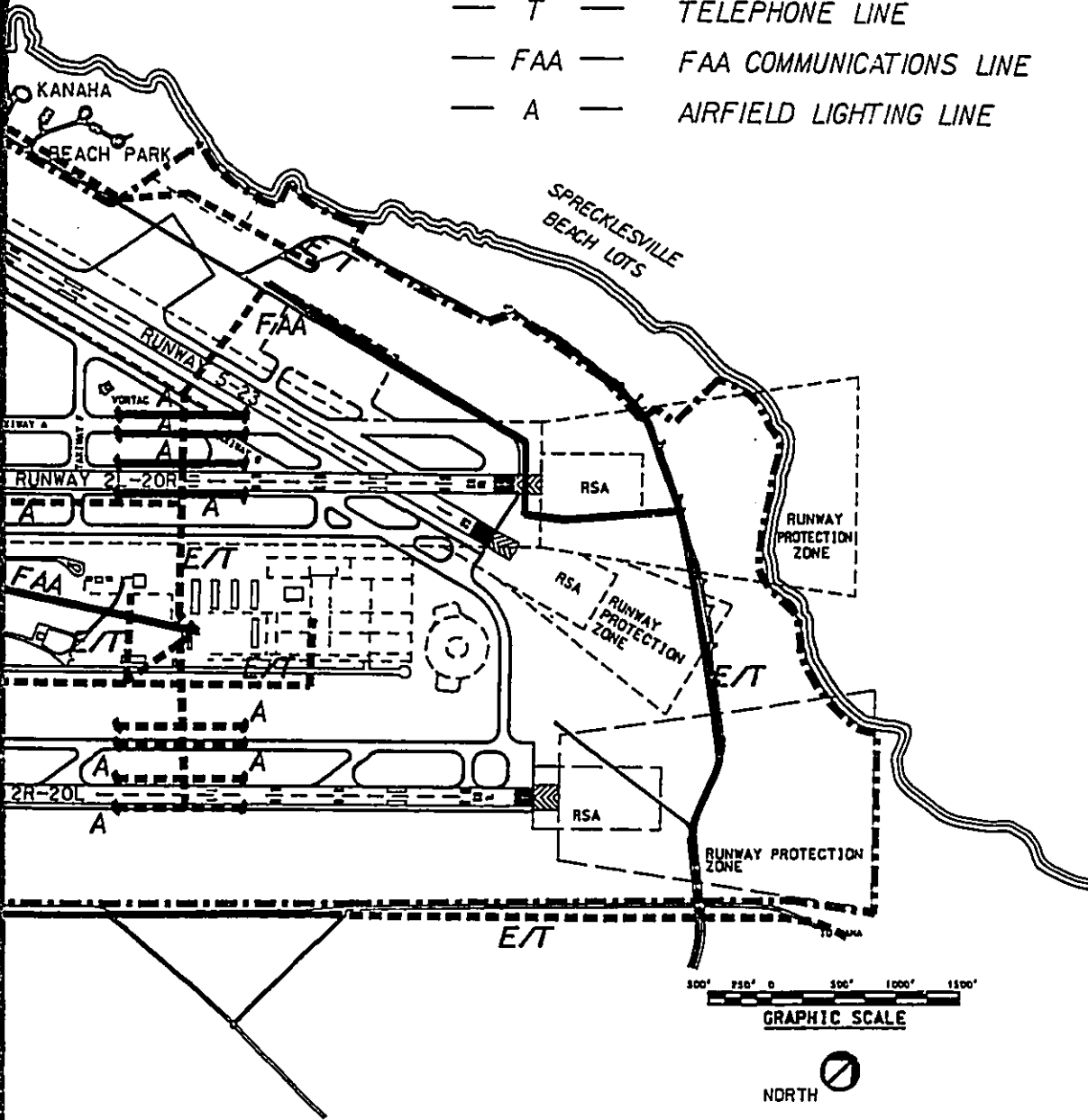


FIGURE 8.6.1

PROJECT TITLE:

KAHULUI  
AIRPORT  
E.I.S.

PROJECT NO.:

SHEET TITLE:

ELECTRIC POWER  
& COMMUNICATION  
SYSTEMS

DATE:  
JULY 1992

SHEET NO.:

FIG. NO.:

Currently two 12.47 kV distribution lines from the Kanaha Substation #2 run underground along Keolani Place to feed the Airport terminal substations and the Ground Transportation Subdivision (GTS). The two distribution lines provide the Airport with a primary distribution line for normal service, and a secondary distribution line for backup service.

The other 12.47 kV distribution line currently runs overhead along Hana Highway and diverts west along Haleakala Highway to feed the helicopter area. The 4.16 kV distribution line running overhead along Hana Highway from the Paia Substation is tapped at the intersection of Hana Highway and Spreckelsville Beach Road to feed various East Ramp facilities. MECO is planning to extend the 12.47 kV overhead distribution line feeding the helicopter area to the general aviation facilities, and eliminate the 4.16 kV distribution line currently serving that area.

Billing information obtained from Kahului Airport indicates that the passenger terminal area consumes an average of approximately 460,000 kilowatt hours (KWH) per month. The East Ramp area is estimated to consume about 11,500 KWH per month.

#### 8.6.1.2 Communications Systems

Hawaiian Telephone Company's (HTCO) serves Kahului Airport with approximately 1,500 telephone lines from its Kahului switching station to the Airport (Figure 8.6.1). The new passenger terminal building is equipped with a State owned PBX switch which services approximately 180 telephone lines, and has the capacity to accommodate 25 percent more lines. Tenants in the passenger terminal building have their own private telephone systems with approximately 100 lines. Rental car operators located in the GTS also have privately owned telephone systems. A HTCO network cable running along Keolani Place serves the GTS and passenger terminal area, and has the capacity to accommodate future expansion in the area.

Approximately 400 telephone lines run overhead from Keolani Place to Aalele Street and Haleakala Highway, underground from the threshold of Runway 2 to the intersection of Kala Road and Haleakala Highway, and then overhead to the East Ramp facilities.

## 8.6.2 PROBABLE IMPACTS

Electrical power and communication systems impacts were assessed on the basis of increased demand, and the ability of MECO and HECO to accommodate the increased demand.

### 8.6.2.1 Electrical Power

#### No-Action Alternatives

Under the Base and Constrained No-Action Scenarios, the completion of Holdrooms C - F and the new baggage claim area will contribute to increased electrical power consumption. Using the average electrical consumption for Kahului Airport's recently completed passenger terminal building, it was determined that a rate of approximately 75 watt hours per square foot per day was being consumed by the building. This rate is comparable to the electrical consumption rate for Honolulu International Airport terminal buildings of 83 watt hours per square foot per day<sup>10</sup>. Using Kahului Airport's current rate, the terminal improvements currently being constructed are estimated to require an additional 15,900 KWH per day (477,000 KWH per month) under the Base No-Action Scenario. Under the Constrained No-Action Scenario, the Airport facilities would be the same and the amount of electricity used should be relatively the same (i.e., 477,000 KWH per month). It is expected that off-Airport facilities for rental cars, flight kitchen and commercial development activities could be developed to service the increased needs at the Airport. If these off-Airport facilities are provided, they would also require electrical power.

<sup>10</sup> "Honolulu International Airport Utilities Evaluation," prepared by Wilson Okamoto & Associates, 1990.



According to MECO staff, the existing 12.47 kV power lines serving the Airport have sufficient capacity, and the capacity of its Kahului Substation can probably be increased to accommodate the potential increase in Airport electrical demand.

To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in electrical demand (and MECO requirements) outside of the Airport would occur.

#### Proposed Action

The Proposed Action is expected to increase electrical demand slightly due to additional airfield lighting and navigational aids compared to the Base and Constrained No-Action Scenarios. The amount of electrical demand would not change significantly for on-Airport facilities for rental cars, flight kitchen and commercial development activities because these facilities could have been provided off-Airport under the No-Action Alternatives and used the same amount of electricity.

The electrical demand outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in electrical demand (and MECO requirements) outside of the Airport would occur.

### 8.6.2.2 Communication Systems

#### No-Action Alternative

Holdrooms C-F and the new baggage claim area will require approximately 40 telephone lines, which are not expected to have a significant impact on HTCO operations.

To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in telephone services outside of the Airport would be needed.

#### Proposed Action

According to HTCO staff, the telephone requirements for the Proposed Action are not expected to have a significant impact on HTCO operations. The network cable line along Keolani Place should have adequate capacity to accommodate the airport improvements.

The need for telephone services outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in telephone services outside of the Airport would be needed.

## **8.7 POLICE AND FIRE PROTECTION SERVICES**

### **8.7.1 POLICE PROTECTION SERVICES**

#### **8.7.1.1 Existing Conditions**

In 1989, Maui County had the highest crime rate per resident population in Hawaii. The County's crime rate decreases when the crimes are measured against the de facto population, which includes the total number of people present in the County, including visitors. When compared to the statewide rate, the de facto crime rate for Maui is actually lower than the statewide rate.

The Maui Police Department is becoming increasingly involved in the security operations at the Airport. They are currently contracted to provide airport security services and are working to implement a more aggressive airport drug interdiction program.

#### **8.7.1.2 Probable Impacts**

##### **No-Action Alternatives**

It is expected that as the resident population and the number of visitors increase, the need for police protection services would increase. To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in police protection services outside of the Airport would be needed.

### Proposed Action

The Proposed Action is not expected to increase the need for police protection services compared to the Base No-Action Scenario, except during construction of the proposed projects. If the low unemployment rate should continue on Maui, in-migration may be necessary to fill up to 232 direct airport-related construction jobs estimated to be generated by the Proposed Action. The magnitude of this impact on police protection services is not considered significant, however, and this impact would be temporary.

To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in police protection services outside of the Airport would be needed.

## 8.7.2 FIRE PROTECTION SERVICES

### 8.7.2.1 Existing Conditions

Kahului Airport's Aircraft Rescue and Firefighting (ARFF) team is primarily responsible for aircraft emergencies, however, the County Fire Department will assist as needed. If an aircraft emergency occurs at Kahului Airport, the County Fire Department would provide mutual aid relating to emergency services, however, their staff are not equipped and generally do not have the experience and training to handle these types of emergencies. Section 9.2 discusses the need to review ARFF staffing requirements at the Airport. Building-related fires at Kahului Airport are handled by both the Airport's ARFF team and the County Fire Department.

Fire and emergency related incidents in the Kahului area are currently served by the Wailuku and Paia fire stations. The Wailuku fire station maintains a daily staff of 15 employees, and is equipped with a total of five trucks consisting of a tanker, rescue truck, fire engine and backup engine, and HAZMAT truck for hazardous materials. The Paia fire station is comprised of one engine truck and a daily staff of five employees.

The County recently constructed a new Kahului fire station along Dairy Road. This new station will have a daily staff of about 14 employees, and be equipped with five new trucks. These trucks will consist of a tanker, rescue truck, fire engine and backup engine, and HAZMAT truck for hazardous materials. All new trucks will also be equipped with foam capabilities for firefighting. The new Kahului fire station will be the primary County station responding to emergencies at Kahului Airport, although the Wailuku and Paia fire stations may also be called to respond depending upon the magnitude of the emergency.

#### 8.7.2.2 Probable Impacts and Potential Mitigation Measures

##### No-Action Alternatives

The total number of aircraft operations is projected to increase from 177,803 aircraft operations in 1989 to 263,500 aircraft operations in 2010 under the Base No-Action Scenario, and 241,700 aircraft operations under the Constrained No-Action Scenario.

Under the Base No-Action Scenario, the increased number of forecast passengers and aircraft operations will increase the possibilities of emergencies occurring at the Airport which could result in additional calls to the County Fire Department for assistance. Under the Constrained No-Action Scenario, up to eight percent fewer aircraft operations and emergencies may occur.

To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in fire protection services outside of the Airport would be needed.

Proposed Action

The total number of aircraft operations is projected to increase from 177,803 aircraft operations in 1989 to 306,000 aircraft operations in 2010 for the Proposed Action. Based on the increase in number of aircraft operations, the Proposed Action may increase the need for County fire protection services by up to 14 percent compared to the Base No-Action Scenario. Compared to the Constrained No-Action Scenario, the need for County fire protection services may increase by up to 21 percent with the Proposed Action.

The need for County fire protection services outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in fire protection services outside of the Airport would be needed.

**8.8 HEALTH CARE FACILITIES**

**8.8.1 EXISTING CONDITIONS**

**8.8.1.1 Maui Memorial Hospital**

Central Maui Memorial Hospital is Maui Island's only full service hospital for Acute Care; other facilities treat long-term and specialty care patients. With 145 acute care beds, the hospital is the sole provider of secondary health services to residents of Maui, Lanai, and to a lesser extent, Molokai. It operates as one hospital in a multi-hospital system administered by the State Department of Health, Community Hospitals Division. Tertiary services are provided on Oahu and/or the mainland. In addition there are private clinics such as the Maui Medical Group and Kaiser Clinic that are not hospitals, but could serve as acute care transfer centers.

The Maui Memorial Hospital system has experienced a number of problems over the last few years including: insufficient funding, shortage of acute care beds, and difficulties in hiring staff. The shortage of acute care beds, for example, is critical with occupancy rates consistently over the 90 percent level. Tourists currently use approximately 5 to 10 percent of the total beds at the Hospital.

In the 1990 Strategic Plan for Maui Memorial Hospital and Hana Medical Center, several significant planning issues were raised. Of relevance to the airport improvements under consideration are issues related to the Rapid Deployment System for emergencies.

According to various Maui Memorial Hospital officials and several doctors quoted in the media, Maui Memorial Hospital could not handle a major aircraft accident at this time. They were able to handle the Aloha Airlines Flight No. 243 emergency in 1988 primarily because only 10 of the 67 passengers required hospitalization; the remaining passengers were treated and released the same day. Currently, DC-10 and L-1011 aircraft can carry over 200 passengers, and they expressed concern that an accident involving these types of aircraft would be beyond their capacity.

#### 8.8.1.2 Rapid Deployment Team

The Rapid Deployment Team (RDT) was developed over the last two years due to the perceived need for an adequate emergency plan in the event of a major airline accident. As a result, the RDT Committee and Members were officially recognized by the State Director of Health as an Advisory Committee to the Director of Health, and placed within the Health Quality Assurance Division through its Emergency Medical Services Branch. The RDT also earned accreditation as part of the National Disaster Medical System which is a federal umbrella organization for disaster response agencies<sup>11</sup>.

The purpose of the RDT is to rapidly mobilize trained volunteer medical personnel and disaster emergency medical supplies to the scene of a mass casualty incident within the County of Maui. The authority would fall under the Hawaii Revised Statutes Chapter 128 Civil Defense and Emergency Act and Chapter 321 State Comprehensive Emergency Medical Services System Act.

<sup>11</sup> "Maui team passes disaster test," The Honolulu Advertiser, Friday, March 15, 1991, Section A12.



The concept of the RDT is to provide a highly specialized group of emergency physicians, nurses and paramedics with adequate medical supplies and the ability to immediately be alerted to any disaster within Maui County, and quickly respond to the scene to assume medical care, triage and treatment. Each team member carries a special airport and State security ID for easy identification and unhampered ability to report to the briefing center in the event of an incident. They also carry a special pager linked to the Maui County Medicom system.

There are presently four resources available to the RDT for the transfer of RDT members and/or patients to appropriate medical care facilities within Maui County or to Oahu. These resources are ambulances, private vans with police escort, civilian fixed wing aircraft and helicopters, and non-civilian fixed wing aircraft and helicopters. Civilian fixed-wing aircraft available for the RDT include the Hawaii Air Ambulance, Kapiolani Children's Hospital Transport Team, Aloha and Hawaiian Airlines, plus 21 civilian helicopters. If needed, non-civilian aircraft are available through the Coast Guard, National Guard, Army and Marine Corps.

A March, 1991 disaster-response drill was held at Kahului Airport as a test of the RDT. The results of the drill were determined to be a success, resulting in the team's accreditation. State Health Director Dr. John Lewin, who was at the drill, was "very, very, impressed" with the team and hoped to expand the concept to other islands<sup>12</sup>.

#### 8.8.1.3 Ambulance Services

Maui has six ambulances, one each for Wailuku, Makawao, Kihei, Lahaina, Kapalua and Hana. There is also one air ambulance, capable of transferring one patient at a time. In any large emergency the Military Medevac can be called in by the Department of Civil Defense. Other larger fixed wing aircraft including military C-130's and commercial aircraft with seats removed can be utilized as needed for emergency transfer of patients to Oahu.

<sup>12</sup> "Disaster team'impressive'," The Maui News, Friday, March 15, 1991, Section A3.

Presently, an International Life Support (ILS) ambulance is stationed at Kahului Airport from 8:00 AM to 6:00 PM on Mondays through Fridays. The ambulance is not stationed at the Airport during evenings, weekends and holidays. In addition, the ILS ambulance responds to off-airport calls as required. Nearby County ambulances can be called for airport emergencies, provided they have not responded to other incidents.

## 8.8.2 PROBABLE IMPACTS

### No-Action Alternatives

The Maui Hospital system currently has numerous problems which hamper the efficient delivery of medical services that are unrelated to the Airport and Airport operations. Unless these problems are addressed, the expected increase in residents and visitors will further strain the delivery of medical services. To the extent that the resident population and the average daily visitor census are greater under the Base No-Action Scenario than for the Constrained No-Action Scenario, a corresponding increase in medical services outside of the Airport would be needed.

The forecast increase in the number of aircraft operations will increase the potential for aircraft emergencies and the corresponding need for emergency medical services. The number of daily DC-10 and L-1011 aircraft operations, for example, is projected to increase from 20 aircraft operations in 1989 to 36 aircraft operations in 2010 under the Base No-Action Scenario, and 28 aircraft operations under the Constrained No-Action Scenario.

Proposed Action

The need for medical services outside of the Airport would be the same for the Proposed Action and the Base No-Action Scenario. To the extent that the resident population and the average daily visitor census are greater under the Proposed Action than for the Constrained No-Action Scenario, a corresponding increase in medical services outside of the Airport would be needed.

The Proposed Action would increase the length of Runway 2L-20R to 9,600 feet in order, among other purposes, to enhance safety in the immediate and long-term. Regarding the potential for a major aircraft emergency involving more than 200 passengers, the projected number of daily DC-10 and L-1011 aircraft operations is the same for the Proposed Action and the Base No-Action Scenario. Compared to the Constrained No-Action Scenario, up to eight more daily DC-10 and L-1011 aircraft operations may occur with the Proposed Action.

Increased support for Maui Memorial Hospital and the RDT will assist in meeting current and future medical requirements.

## 8.9 RECREATIONAL FACILITIES

### 8.9.1 EXISTING CONDITIONS

Major recreational activities in the vicinity of Kahului Airport are primarily associated with ocean-related activities located along the coastline from Kahului Harbor to Spreckelsville Beach. Recreational facilities identified are Kahului Harbor Park and Kahului Beach (located within Kahului Harbor), Kanaha Beach Park, and Spreckelsville Beach.

Kahului Beach is a privately owned brown sand beach which begins at a revetment lining the makai edge of Kahului Beach Road and ends at Pier 2. The offshore floor, consisting of a mixture of sand and rocks, is shallow and generally safe for swimming, but usually doesn't attract many swimmers. Being a privately owned beach, proposed airport improvements would not impact the access or use of this beach. Consequently, this beach was eliminated from further detailed analysis.

#### Kahului Harbor Park

Kahului Harbor Park is located within the harbor area. With the exception of two sections of beach, the shoreline within this harbor is made up of artificial structures. The harbor consists of a west and east breakwater with a 660 foot wide entrance channel between these breakwaters.

Kahului Harbor Park, developed on a coral stockpile forming the harbor's west breakwater, is maintained by Maui County's Department of Parks and Recreation. A concrete boat ramp is also provided on the harbor's west breakwater located along Kahului Beach Road. Surf breaking on the reef located just outside the ramp makes the area popular for surfers. A small narrow shingle beach lies inshore of this ramp, but does not serve as a good swimming area because the offshore floor is shallow and rocky, and the water usually murky. This area of the harbor is frequented primarily by fishermen, surfers, and limu gatherers.

### Kanaha Beach Park

Kanaha Beach Park is a County maintained park fronted by a wide white sand beach which is broken into numerous pockets by a series of boulder groins. These rock piles were placed in the ocean to minimize erosion problems which have occurred for the entire shoreline from Kuau to Waihee for many years. The inshore floor is shallow and composed of a mixture of sand and rocks making swimming in the area attractive primarily to children. The water is almost invariably murky and is frequented by fishermen, limu pickers, picnickers and windsurfers.

Facilities at the beach park include two restroom facilities located at each end of the park, showers, barbecue grills, and several paved parking lots. There are about 30 picnic tables available, however, many residents bring their own tables on weekends because there are not enough to meet current demand. A zodiac is also stationed at the park for use by County lifeguards.

Based upon discussions with the County's Parks and Recreation staff, the activity level at Kanaha Beach Park had been relatively slow at Kanaha Beach Park before the windsurfing popularity and activity picked up over years. Activity levels were estimated to be about 100 visitors a day on weekdays and 500 or less on weekends.

Currently, the activity level is estimated to be approximately 500 visitors a day on weekdays and a 1,000 visitors on weekends. Discussions with County staff indicates that about 80 percent of the visitors to the beach park on weekdays are tourist related with the remaining 20 percent consisting of residents. On weekends and holidays, this ratio is estimated to be about 50 percent tourist related and 50 percent residents. During weekends, Kanaha Beach Park becomes overcrowded with visitors creating the need for more grassed areas, picnic facilities, restrooms and parking. Parking is also a problem since there is a shortage of available stalls to meet current demands.

Although sunbathing and picnicking activities are popular, the predominant activity occurring at this beach park is windsurfing. Swimming activities are limited with an estimated 50 people swimming on weekdays and about 100 on weekends. During the morning, the predominant visitors are fishermen since this coastline supports a wide variety of shoreline fishing especially around the undeveloped area east of Kanaha Beach Park and near Ka'a Point. During afternoons, windsurfing is the primary beach activity occurring. Windsurfers at Kanaha Beach Park generally tend to be beginners while those with more experience usually go to either Spreckelsville Beach or Hookipa Beach Park. There are also a number of tourists who windsurf at this beach park usually through commercial rental companies. These rental companies generally conduct their windsurfing activities near the eastern end of the park.

#### Spreckelsville Beach

Spreckelsville Beach stretches for over two miles along the coast beginning at West Spreckelsville near the end of Old Stable Road and ending at the Maui Country Club. This shoreline is broken into a series of short beaches by points of lava, boulders, beach rock, and groins constructed to retain sand. As with other parts of this coastline, Spreckelsville Beach has had serious erosion problems over the years. The inshore floor along most of this beach is rocky with scattered patches of sand, and the water is often murky. The open shoreline between Stables and East Spreckelsville is the only public section of this beach. Other areas can be reached by following the shoreline from Kanaha Beach Park or H. A. Baldwin Park.

As with Kanaha Beach Park, the historical level of activity at this beach was generally low until the popularity of windsurfing picked up. Discussions with County staff indicated that about 100 people used to visit this beach on weekends many of whom were fishermen. Today, this beach is frequented primarily by windsurfers, fishermen, and divers. The most popular area is "Stables" which is located near the intersection of Hana Highway with Spreckelsville Beach Road.

The current level of activity is estimated to be about 500 visitors on weekdays and 750 people on weekends. Generally, fishermen usually fish during the early mornings along with divers looking for octopus (tako). However, the major activity occurring at this beach is windsurfing. Parking in the area is also a problem due to the lack of available space.

#### 8.9.2 PROBABLE IMPACTS

Recreational impacts to identified beach parks were assessed based upon the predicted changes associated with: 1) access to recreational facilities, and 2) use of recreational facilities. Probable impacts to the existing *access* of recreational facilities were assessed in terms of physical changes to facilities functioning as constraints or opportunities. Impacts associated with *use* were assessed in terms of increased demand for recreational facilities using a ratio analysis based upon available data. Impacts associated with *coastal resources and biota* discussed in AECOS's study (Appendix B) were also incorporated.

##### 8.9.2.1 No Action Alternative

Under both the Base and Constrained No-Action Scenarios, no major improvements to identified recreational facilities would occur. As a result, there should be no impacts to the existing access of recreational facilities under either alternatives.

##### Base No-Action Scenario

Under this scenario, Maui's resident population was forecast to increase to 143,500 residents with an average daily tourist population of 71,800 visitors. As a result, increased use of recreational facilities by residents and visitors would result.

Recreational activities occurring at Kahului Harbor Park, such as fishing and surfing, are predominantly activities conducted by Maui residents. Thus, the increased resident population under this scenario should result in a greater number of residents participating in activities contributing to increased congestion. However, since the nature of these activities are closely tied to ocean conditions, such as the height of waves or frequency of fish biting during a particular time period, estimating the demand for activities at this park is difficult and would probably be more dependent upon ocean conditions.

The number of daily visitors to Kanaha Beach Park is expected to increase to about 830 people during weekdays and 1660 people on weekends. As a result, increased congestion would occur which would further aggravate existing problems such as parking and the lack of available picnic tables. During weekdays, the majority of visitors are expected to be windsurfers. On weekends, a sizable percentage of visitors would be associated with picnic related activities, however, windsurfers would continue to make up the majority of visitors. As discussed above, the number of fishing and diving related visitors would probably be dependent upon ocean conditions, however, this activity is estimated to consist of about 5% of the total visitors. Table 8.9.1 shows the results of the analysis.

The number of daily visitors to Spreckelsville Beach are also expected to increase growing to about 830 people during weekdays and 1250 people on weekends assuming the popularity of windsurfing continues. Windsurfers would continue to comprise the great majority of visitors since fishing and other related visitors are estimated to consist of only 10% of the total. This increase of windsurfers in the area would contribute to increased congestion concentrated in the area. The results of the analysis are shown on Table 8.9.1.



Table 8.9.1 Recreational Activity Analysis

	<u>Weekday</u>	<u>Weekend</u>
<b>Existing Conditions</b>		
Kanaha Beach Park		
Windsurfing	300	450
Other Activities	<u>200</u>	<u>550</u>
Total Visitors	500	1,000
Spreckelsville Beach		
Windsurfing	450	675
Other Activities	<u>50</u>	<u>75</u>
Total Visitors	500	750
<b>2010 No Action - Base No-Action Scenario</b>		
Kanaha Beach Park		
Windsurfing	500	750
Other Activities	<u>330</u>	<u>910</u>
Total Visitors	830	1,660
Spreckelsville Beach		
Windsurfing	750	1,125
Other Activities	<u>80</u>	<u>125</u>
Total Visitors	830	1,250
<b>2010 No Action - Constrained No-Action Scenario</b>		
Kanaha Beach Park		
Windsurfing	490	730
Other Activities	<u>320</u>	<u>890</u>
Total Visitors	810	1,620
Spreckelsville Beach		
Windsurfing	730	1,090
Other Activities	<u>80</u>	<u>125</u>
Total Visitors	810	1,215
<b>2010 With Proposed Action</b>		
Kanaha Beach Park		
Windsurfing	500	750
Other Activities	<u>330</u>	<u>910</u>
Total Visitors	830	1,660
Spreckelsville Beach		
Windsurfing	750	1,125
Other Activities	<u>80</u>	<u>125</u>
Total Visitors	830	1,250

Source: Pacific Planning & Engineering, Inc.

### Constrained No-Action Scenario

Under this scenario, Maui's resident population will remain the same as under the Base No-Action Scenario with 143,500 residents. The average daily tourist population would decrease to 65,800 visitors.

The lower number of daily tourist under this scenario is expected to result in minimal changes to the estimated level of activity conducted at Kahului Harbor Park under the Base No-Action Scenario because Maui residents are the predominant visitors to the park. Thus, the increased resident population under this scenario should result in increased congestion and conditions similar to the Base No-Action Scenario.

The number of daily visitors to Kanaha Beach Park is estimated to grow to about 810 people during weekdays and 1,620 people on weekends under this scenario. As shown on Table 8.9.1, this represents a slight change from the Base No-Action Scenario of only 20 people on weekdays and 40 people on weekends. This difference should not result in a major change in the expected problems and level of congestion occurring under the Base No-Action Scenario. Windsurfers would continue to be the predominant activity.

The number of daily visitors to Spreckelsville Beach is estimated to grow to about 810 people during weekdays and 1,215 people on weekends under this scenario. This represents a slight difference of only 20 people on weekdays and 35 people on weekends from the Base No-Action Scenario. This difference should not result in a major change in the expected level of congestion and activity which would still be dominated by windsurfers.

#### 8.9.2.2 Proposed Action

Under the proposed action, the Kanaha Beach Park improvement would increase the amount of developed park land accessible for public use. This project would expand the existing beach park by developing adjacent airport property located east of the park. The remaining airport projects proposed would not eliminate existing access to recreational facilities available for the public. Old Stable Road and Spreckelsville Beach Road would remain open allowing vehicle access to Spreckelsville Beach.

Projects which may impact the use of recreational facilities are the extension of Runway 2-20, the new parallel runway, and connecting taxiways for the parallel runway.

The new parallel runway and connecting taxiways would result in the occasional flow of water runoff through the proposed drainage outlet along the Spreckelsville coast. Since this drainage system is anticipated to carry little or no water throughout most of the year, the benthic biota found in the nearshore environment should not be adversely impacted (see Appendix B). As a result, these projects should not result in major impacts to fishing and diving activities anticipated to occur at beaches located in this area. The site of this drainage outlet at Spreckelsville Beach is also located in an area avoided by windsurfers and swimmers due to the presence of numerous boulders near the shore. Thus, there should be minimal limitations and resulting impacts to the future use of this shoreline area by visitors such as windsurfers.

Under the Base No-Action Scenario, the number of visitors and activities occurring at Kahului Harbor Park, Kanaha Beach Park, and Spreckelsville Beach would remain the same as under the Base No-Action Scenario. The estimated number of users are shown on Table 8.9.1. Consequently, the level of congestion and impacts resulting to these beach parks would also remain the same with the exception of Kanaha Beach Park.

The proposed improvements to Kanaha Beach Park are expected to alleviate some of the congestion associated with parking, picnic tables, and facilities anticipated under the Base No-Action Scenario. The amount of facilities which should be provided to alleviate this congestion would be better determined during the design phase of this project.

Under the Constrained No-Action Scenario, the extension of Runway 2-20 could allow up to 906,000 more passengers to visit Maui compared with the Constrained No-Action Scenario. As a result, the runway extension may result in increased number of visitors and level of activities occurring at these beach parks. However, this difference is expected to result in insignificant changes to the the level of congestion and impacts resulting under the Base No-Action Scenario. As shown on Table 8.9.1, it is estimated that there would be up to an additional 20 daily visitors to Kanaha Beach Park and Spreckelsville Beach during weekdays. On weekends, there would be up to an additional 40 visitors and 35 visitors to Kanaha Beach Park and Spreckelsville Beach respectively.

### 8.9.3 POTENTIAL MITIGATION MEASURES

Additional facilities are needed to meet the existing and future number of visitors to Kanaha Beach Park and alleviate existing problems such as parking. Therefore, adequate facilities should be provided with the proposed Kanaha Beach Park improvements project to help alleviate some of the congestion. However, this improvement may not be enough to meet the future demand, thus, additional developed park areas should be planned for along the western shoreline of Kanaha Beach Park. The County of Maui should work with the State Department of Transportation in pursuing the the potential expansion of Kanaha Beach Park along this shoreline.

Concerns expressed by Maui residents over impacts associated with improvements to Kahului Airport has led DOT to volunteer in preparing a Shoreline Recreational Plan. This recreational plan includes the participation of Maui County agencies and various organizations in the development of a shoreline plan. This plan is intended to identify important recreational facilities and resources along the shoreline area between Kahului Harbor and Hookipa Beach Park, and suggest a direction and means for coordinating the management of these resources. The plan should be completed sometime after the completion of the Kahului Airport Master Plan, and should be incorporated in the future planning and development of the shoreline area.

## 8.10 EDUCATIONAL FACILITIES

This Section discusses the probable impacts to educational facilities which is included in its entirety in the socio-economic study prepared by Earthplan in Appendix H.

### 8.10.1 EXISTING CONDITIONS

The State Department of Education (DOE) administers three complexes on the island of Maui. The Baldwin Complex includes elementary, intermediate and the high schools in South Maui and Wailuku. The Lahainaluna Complex encompasses the schools of West Maui. Finally, the Maui Complex encompasses the Upcountry and Kahului schools. In 1990, the three complexes had a total enrollment of 13,760 students with Baldwin (6,400 students) and Maui (5,145 students) having the predominant majority share of students.

### 8.10.2 PROBABLE IMPACTS

Table 8.10.1 shows the projected enrollment figures for 1996 which indicates the total island enrollment is expected to increase by over 3,300 students. Since the 1996 enrollment would greatly exceed the 1990 capacity of 13,780, additional school facilities would be needed to accommodate this increase. The largest increase is expected in the Baldwin Complex, particularly Waihee Elementary (357), Lokelani Intermediate (460), and Baldwin High School (579).

Within the next five years, there will need to be additional school facilities to accommodate projected enrollment growth on Maui. Currently, there is a new elementary school in Kihei, and two other elementary schools are planned for Wailuku along with one for Lahainaluna.

Table 8.10.1  
Actual and Projected Public School Enrollments

	1990 Capacity	1990 Actual Enrollment	1996 Projected Enrollment	Enrollment Change 1990 to 1996
<b>Baldwin Complex</b>				
Kihei Elementary	1,019	1,219	1,383	164
Lihikai Elementary	1,011	945	960	15
Waihee Elementary	883	493	850	357
Wailuku	918	1,067	1,162	95
Iao Intermediate	660	641	929	288
Lokelani Intermediate	568	310	770	460
Baldwin High	1,650	1,725	2,304	579
<b>Subtotal</b>	<b>6,709</b>	<b>6,400</b>	<b>8,358</b>	<b>1,958</b>
<b>Lahainaluna Complex</b>				
Kamehameha III	671	661	760	99
Nahienaena	479	386	445	59
Lahaina Intermediate	533	410	642	232
Lahainaluna High	835	758	889	131
<b>Subtotal</b>	<b>2,518</b>	<b>2,215</b>	<b>2,736</b>	<b>521</b>
<b>Maui Complex</b>				
Haiku	385	407	359	(48)
Kahului	966	1,050	1,513	463
Kula	422	505	487	(18)
Makawao	342	691	754	63
Paia	432	181	289	108
Pukalani	515	608	588	(20)
Kalama Intermediate	836	994	1,301	307
Maui-Waena Intermediate	610	508	650	142
Maui High	1,405	1,658	1,903	245
<b>Subtotal</b>	<b>4,562</b>	<b>5,145</b>	<b>5,972</b>	<b>827</b>
<b>Total Island</b>	<b>13,789</b>	<b>13,760</b>	<b>17,066</b>	<b>3,306</b>

Source: Computer printout from Facilities Branch of the State Department of Education, dated April 1991

### No Action Alternative

Under the Base No-Action Scenario, approximately 4,000 more students would be added to the school system based upon the estimated 13,000 additional housing units required to house the increased number of workers.

Under the Constrained No-Action Scenario, there would be about 6,000 housing units less than what would be required under the Base No-Action Scenario. Based upon this lower housing units figure, approximately 2,100 more students would be added to the school system in the year 2010.

### Proposed Action

Improvements recommended by the Master Plan are expected to result in the same level of passenger activity forecast under the No Action Base No-Action Scenario. Therefore, there should be relatively no changes to the additional 4,000 students enrolled in the school system.

Under the Constrained No-Action Scenario, only 2,100 additional students would be enrolled in the school system. Thus, the improvement of airport runway could facilitate the addition of up to 1,900 students in the year 2010.

### 8.10.3 POTENTIAL MITIGATION MEASURES

To mitigate the increased level of student enrollments on Maui projected in the year 2010, additional school facilities will need to be provided beyond what is currently planned for. In planning for future school facilities, the projections conducted periodically by the State DOE should be incorporated to ensure the proper planning and phasing of school facilities to meet changing demographics and community needs.



## 9.0 OPERATIONAL AND OTHER ISSUES

### 9.1 RUNWAY 2-20 LENGTH OF 7,000 FEET

This section discusses the "operational" issues associated with Runway 2-20's length of 7,000 feet. This discussion applies to the No Action Alternatives where Runway 2-20 would not be extended and remain at 7,000 feet.

Currently, interisland aircraft, including B-737 and DC-9 aircraft, and overseas aircraft, including DC-10 and L-1011 aircraft land at and takeoff from Kahului Airport. A review of DOT's Aircraft Rescue and Firefighting (ARFF) records between 1982 and 1990 showed that four (4) aircraft crashes occurred at Kahului Airport during the nine year period. None of the four crashes were related to insufficient runway length. Three crashes involving one helicopter and two small Cessna aircraft were due to mechanical malfunctions or insufficient fuel. The fourth crash was a ground collision involving two Twin Beech aircraft. The ARFF records are summarized in Table 9.1.1.

Airlines operating at the Airport follow their internal company and airplane manufacturers' operating manuals for each aircraft. These manuals specify the maximum allowable landing and takeoff weights for different runway lengths, flap settings, airport elevations, and various environmental conditions such as temperature and wind. Airlines follow these guidelines to operate within safe parameters for a given airport environment. Airlines operating at Kahului Airport load their aircraft in compliance with the applicable guidelines to ensure safe operations on the 7,000 foot runway. This typically involves restricting the amount of passengers, baggage, or cargo that the aircraft carry. In some cases (American Airlines DC-10 flights to the West Coast, for example), the restrictions have led the airlines to route their departures to the Mainland through Honolulu, where the longer runways permit unrestricted operations.

Table 9.1.1  
 Summary Of Aircraft Rescue and Firefighting Record  
 Kahului Airport  
 1982-1990

Incident	Total	Per Cent	Number of Incidents																	
			1989	1988	1987	1986	1985	1984	1983	1982										
<b>Brakes and Tires</b>	20																			
Hot brakes		4.1%	3	2	4	4	2													
Brake failure/problems	5	1.0%	4																	1
Flat tire / low pressure	19	3.9%	2	4	3	1	3	2												1
New brakes	4	0.8%	1	1	1	1	1													
<b>Fuel and Oil</b>	59	12.1%	7	4	3	6	4	7	8	14										
Fuel spill	11	2.2%	1			2	2	4												2
Oil spill	78	16.0%	7	1	8	9	10	14	11	15										
Hazardous cargo refuel standby	40	8.2%	22	13			1	2	1	1										
Hot refueling standby																				
Aircraft low on fuel/oil	4	0.8%	1			1														2
<b>Mechanical</b>	47	9.6%	7	1	5	7	4	4	7	5										
Landing gear problems	34	7.0%	1	2	1	2	5	12	2	4										
Engine shut down	14	2.9%	1	4	1	3	1	1	1	1										
Engine fire/smoke	39	8.0%	5	3	4	5	6	7	4	3										
Other engine malfunctions	6	1.2%	1	1	1	1	1	1	1	1										
Smoke/fire in aircraft	17	3.5%	6	3	1	2	1	1	1	1										
Loss of hydraulic oil/pressure	7	1.4%	2			1	1	1	1	1										
Electrical loss	1	0.2%				1		1												
Electrical fire	23	4.7%	8	2	2	3	2	3	2	2										
Other malfunctions																				
<b>Miscellaneous</b>	3	0.6%					1													
Aborted take-off	4	0.8%				1	1													
Aircraft crash	2	0.4%	1		1															
Bird strike	52	10.6%	5	5	9	3	3	2	7	5										
Standby, drills and others																				
<b>Total</b>	489	100.0%	78	49	46	51	43	61	48	60										

Source: Hawaii Department of Transportation

In the event an aircraft develops problems enroute to or from Kahului Airport, the aircraft could land at Honolulu or Hilo International Airports. Overseas aircraft have a fuel reserve which enable the aircraft to travel to an alternate Hawaii airport if needed. A DC-10 aircraft flying from the West Coast to Maui, for example, would have enough fuel to land at Honolulu International Airport if the pilot felt he needed a longer runway to land safely.

The Airline Pilots Association (ALPA) believes Runway 2-20 should be lengthened to a minimum of 8,500 feet to "enhance the safety aspect of (current) air operations." ALPA supports the longer runway because the "Takeoff and landing performance criteria, which the Association (ALPA) feels is inadequate, is based on new aircraft, with new brakes, using no allowance for in service deterioration. The hypothetical models do not allow for factors such as: weather, wind shear, multiple mechanical malfunctions, including blown tires, that would greatly increase the rejected takeoff and landing distance. It should be noted that the rejected takeoff performance is based ONLY on engine failure, not on other aircraft malfunctions."<sup>13</sup> ALPA pilots also believe wind shear is a regular problem which increases the difficulty of landings and takeoffs at Kahului Airport.

The Proposed Action would increase the length of Runway 2L-20R to 9,600 feet in order, among other purposes, to enhance safety in the immediate and long-term.

## **9.2 AIRCRAFT RESCUE AND FIREFIGHTING**

Overseas passengers are forecast to increase from 1,081,411 passengers in 1989 to 2,377,000 passengers in 2010 for all alternatives except for the Constrained No-Action Scenario. The doubling of overseas passengers means the number of wide-bodied jets (e.g. DC-10, L-1011) will also approximately double.

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<sup>13</sup> Airline Pilots Association letter to Mr. Alvin Chong, May 1, 1991.

DOT currently has 24 full-time Aircraft Rescue and Firefighting (ARFF) positions to work three shifts. ARFF personnel believe they have adequate equipment and extinguishing agent to handle a wide-bodied jet emergency, but may not have sufficient manpower for certain situations. In the event an emergency occurred at Kahului Airport, the quick rescue of passengers would be the first priority, and fire suppression a secondary priority. If a major DC-10/L-1011 emergency occurred, for example, each of the 8 fire fighters on duty may need to rescue up to 35 passengers. Further, the number of passengers to be rescued by each fire fighter could be higher because up to three personnel are needed to operate the fire trucks and secure the area. In addition, County Fire Department personnel will respond when requested and if available, however, they may not be on the scene during the critical first three minutes of an emergency. The FAA currently does not have standards establishing the minimum number of ARFF personnel for a given type of airport.

DOT is attempting to increase its Kahului Airport ARFF staff through the budgetary process.

### **9.3 FAA AUTHORITY**

In general, the FAA controls the airspace including routes, aircraft operations and navigational services, and the airport operator (State) controls the airport facilities and ground operations. This segregation of authority was demonstrated in March, 1987 when DOT attempted to implement a night curfew prohibiting aircraft operations on Runway 5-23 between the hours of 11:30 PM and 6:00 AM due to noise complaints. The FAA disapproved the night curfew on the basis that the action was not supported by an FAR Part 150 Noise Compatibility Study, and the curfew was rescinded.

The FAA has approved night closures at several airports on the U.S. mainland which have experienced noise problems. The situation on Maui is different because there are no other airports operating on the island at night, and the public can not drive to Maui from another island.

The FAA's authority over airspace was confirmed by its Honolulu Airports District Office Manager who stated the State would need FAA approval if it wanted to close a runway to prohibit air traffic while the runway was not under reconstruction or otherwise closed, and was safe for aircraft landings and takeoffs. The FAA official also stated the State would need FAA approval if it wanted to prohibit a certain type of aircraft from using a certain runway.

Section 261-13.5. Hawaii Revised Statutes

Under Section 261-13.5, Hawaii Revised Statutes, DOT has the responsibility to enhance the safe use of State airports as follows:

"The department of transportation shall do everything within its authority to enhance the safe use of the State's airports and shall cooperate with appropriate federal agencies and other affected parties to assist said agencies in meeting their responsibility to alleviate safety hazards resulting from air traffic congestion. In carrying out this responsibility, the department shall consider all possible alternatives including but not limited to reliever airports and limiting the number of aircraft allowed to use state airports."

Presently, Kahului Airport is not experiencing any safety hazards resulting from air traffic congestion.

## 9.4 INTERISLAND TRAVEL

This Section discusses the interisland travel issues raised during the scoping process. Several persons expressed a desire to know the passenger breakdown between visitors and residents that use Kahului Airport. They felt additional airport improvements would benefit visitors more than residents. Other people wanted to know if interisland airfares were affected by Mainland (overseas) service or could be affected by the cost of the Proposed Action.

### 9.4.1 PASSENGER BREAKDOWN

Currently, Hawaii residents comprise approximately 13 percent of the passengers traveling to and from Maui. In 1990, the Hawaii Visitors Bureau estimated 2,345,060 visitors traveled to Maui including 1,954,860 westbound visitors and 390,200 eastbound visitors. The 4,690,120 passengers (2,345,060 visitors were multiplied by 2 because they arrived and departed Maui) to Maui are equal to 87 percent of the 5,389,039 passengers to Maui (Kahului, Kapalua-West Maui and Hana Airports). The remaining 13 percent of passengers traveling to and from Maui are assumed to be Hawaii residents.

### 9.4.2 INTERISLAND AIRFARES

Direct overseas flights to Kahului Airport have not caused higher interisland airfares to or from Maui. Regular scheduled direct overseas flights to Kahului Airport began in January, 1983. Since 1983, the number of direct overseas passengers to Maui have increased almost 350 percent from 321,085 passengers in 1983 to 1,117,242 passengers in 1990. During the same period, interisland airfares have fluctuated in a fairly narrow range, with the nine year average airfare of \$47.33 being less than the airfare in 1983 of \$49.95. Table 9.4.1 is a compilation of regular one-way "kamaaina" (local resident) fares from Honolulu to Kahului Airport for the period 1982 through 1990.

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**Table 9.4.1.**  
**Regular One-Way "Kamaaina" Fares**  
**From Honolulu To Kahului Airport**  
**1982 - 1990**

<u>Year</u>	<u>Airfare</u>
1982	\$48.00
1983	\$49.95
1984	\$49.95
1985	\$44.95
1986	No data
1987	\$48.95
1988	\$41.95
1989	\$44.95
1990	\$49.95
Nine year average	\$47.33

**Airfares for selected Hawaiian Airlines DC-9 flights**

**Source: 1990 "The State of Hawaii Data Book," published by the Department of Business, Economic Development & Tourism, State of Hawaii**

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Regarding the effects of the cost of the Proposed Action on interisland airfares, DOT operates and maintains 14 State airports as a single integrated system for financial purposes. Historically, the Neighbor Island airports, including Kahului Airport, have received subsidies from the Airports System as a whole, and this policy is expected to continue. According to a recent Airport Bond Prospectus, airline costs per enplaned passenger for the Statewide Airports System is forecast to be considerably higher than current costs due to the large capital improvement program planned for all State airports and the forecast reduction in duty free revenues. The increased airline costs could result in increased airline fares.

## 9.5 INTRODUCTION OF PLANT PESTS AND ANIMALS

This Section discusses the concerns raised that airport improvements would increase the potential for introduction of plant pests and animals to Maui.

### 9.5.1 BACKGROUND

The Plant Quarantine Branch, State Department of Agriculture (DOA) is responsible for minimizing the introduction of harmful insects, plant diseases, illegal animals, and other pests from the U.S. The U.S. Department of Agriculture (USDA) provides basically the same inspection services for ships and aircraft from foreign countries. The State and Federal plant quarantine agencies work closely with other agencies and transportation companies to prevent insect pests and illegal non-domestic animals from entering Hawaii.

The State and Federal plant quarantine agencies are successful in preventing a significant number of pests from becoming established in Hawaii. The State DOA, for example, intercepted the following numbers of infested horticultural and agricultural materials which were subjected to disinfestation treatments before being released from 1985 through 1990:

<u>Year</u>	<u>Maritime</u>	<u>Airport</u>	<u>Total</u>
1985	2,664	111	2,775
1986	10,866	181	11,047
1987	30,550	165	30,715
1988	142	130	272
1989	1,050	2,407	3,457
1990	3,419	321	3,740



Despite these agencies' careful efforts, new pests manage to enter the State every year. Hawaii's heavy international and domestic traffic of goods and people, mild climate, wide variety of plant material and the lack of natural enemies, enable new plant pests to "hitch-hike" or be "smuggled" on prohibited plants and become established in the State. Figure 9.5.1 depicts the number of newly established immigrant pests found in Hawaii each year during the period 1970 through 1990. During the twenty year period, an average of 20 newly established immigrant pests were found in Hawaii each year. State DOA estimated 7 percent<sup>14</sup> of the new pests are considered to be "serious" pests.

#### 9.5.1.1 Suspected Entry Pathways Into The State

A State DOA survey of its inspectors identified the following six major pathways that pests and illegal animals are believed to enter the State:

1. Airline Passengers - 27 percent. Airline passengers were believed to be the primary source for introduction of illegal animals. Both plants and animals were suspected of being hidden in carry-on and check-in baggage.

2. First Class Mail - 23 percent. Plant quarantine inspectors do not inspect first-class mail which is a suspected pathway for the introduction of pests and plant diseases on propagative plant materials.

3. Cargo - 18 percent. Pests were believed to be introduced by cargo from scheduled maritime shipments (6 percent), airline shipments (9 percent), and private unscheduled companies (3 percent).

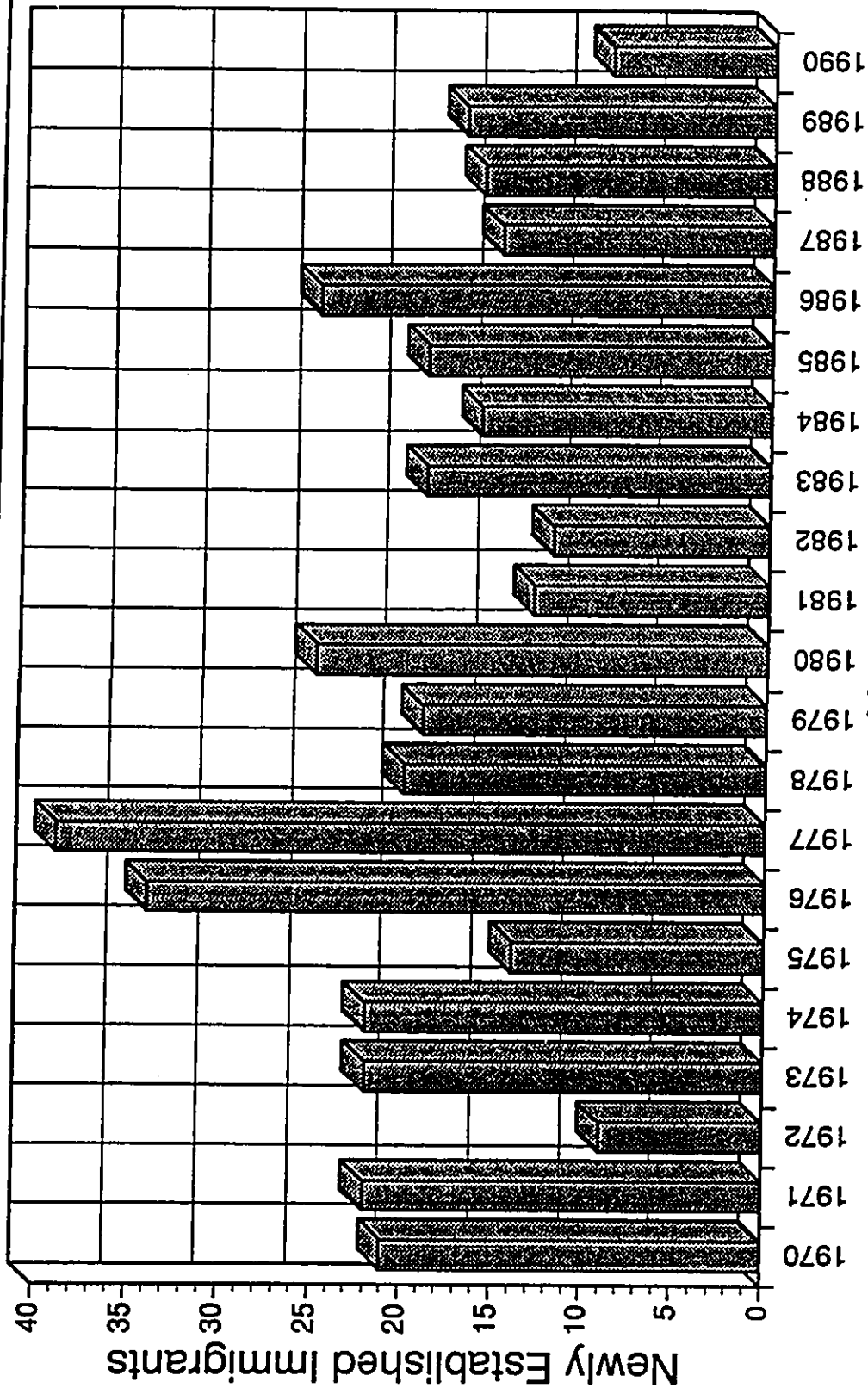
4. Military - 13 percent. Pests and illegal animals were believed to be introduced by passengers, baggage, and hitch-hikers on military carriers.

5. Foreign Inspections - 13 percent. Federal quarantine officials inspect foreign arrivals and enforce USDA plant regulations which are different from State regulations.

6. Private Yachts and Airplanes - 6 percent. Private yachts, ships, and airplanes were believed to be another means of pest introductions.

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<sup>14</sup> "Annual Report - Fiscal Year 1986," Department of Agriculture, State of Hawaii



■ New Pests

Airports Division  
Department of Transportation  
State of Hawaii

Introduced Pests to Hawaii, 1970-1990

PACIFIC PLANNING  
ENGINEERING, INC.

Figure 9.5.1

In addition, Federal officials inspecting foreign arrivals believe military flights have the greatest number of actual and potential introductions of foreign pests. The number of pests intercepted by USDA inspectors on international military flights is significantly higher than on international commercial flights. Data from the USDA provided below, show a total of 144 pests intercepted from visual field inspections of aircraft upon arrival from international locations between 1986 and 1990. In addition, pests are intercepted during the FIS processing of international passengers.

<u>Year</u>	<u>Number of Pests Intercepted</u>	
	<u>HIA</u>	<u>Hickam AFB</u>
1986	12	0
1987	2	0
1988	5	28
1989	3	34
1990	<u>6</u>	<u>54</u>
Total	28	116

International military flights landing at Hickam Air Force Base have experienced four times the number of interceptions compared to international commercial flights landing at Honolulu International Airport (HIA). Federal officials inspecting foreign aircraft have indicated that military flights have higher incidences of pest interception due to the following factors:

- Military flights do not use enclosed loading bridges for passengers boarding the aircraft from the terminal gate to the aircraft as regularly as commercial flights which increases the chance of pests entering the cabin.
- Military airports are often located in more rural or isolated areas having surrounding environments where pests are more likely to be present.
- The large cargo loading doors of most military aircraft create increased opportunities for pests to enter the aircraft when loading cargo.

- Military flights associated with night operations require lighting during cargo loading and passenger boarding which become a source of attraction for pests.

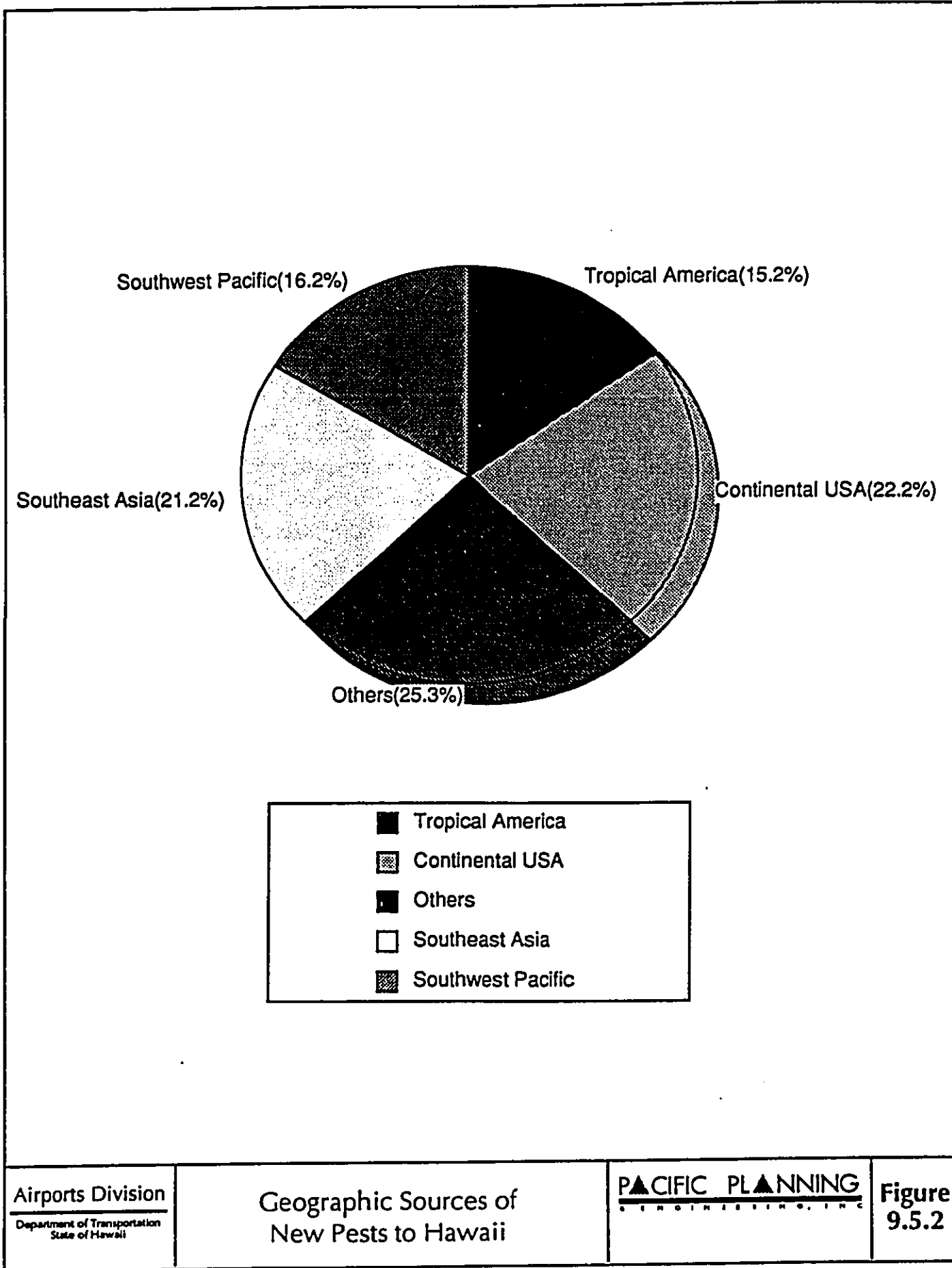
#### 9.5.1.2 Sources Of Pests

When a pest is discovered in the field, it is difficult to determine the pest's place of origin because it may have come from several areas, or research literature is nonexistent. Given this limitation, State DOA identified the possible sources of new pests for the period 1976 through 1990 shown on Figure 9.5.2 and summarized below:

<u>Geographic Area</u>	<u>Percent</u>
Continental United States	22.2
Southwest Pacific	16.2
Southeast Asia	21.2
Tropical America	15.2
Others	<u>25.2</u>
Total	100.0

#### 9.5.1.3 Plant Pest Control

According to the State DOA, it utilizes an integrated pest management approach combining the use of chemical, mechanical and biological practices whenever applicable to achieve control over pest populations. This approach emphasizes less dependency on chemical pesticides and more judicious use of chemical pesticides to decrease environmental impacts, and increased usage of natural control of pests. Natural control of pests (biological control) utilizes the actions of natural enemies of the pest, such as parasites, predators and pathogens to reduce plant pest population densities and maintain them at low levels.



**Airports Division**  
 Department of Transportation  
 State of Hawaii

**Geographic Sources of  
 New Pests to Hawaii**

**PACIFIC PLANNING**  
 ENGINEERING, INC.

**Figure  
 9.5.2**

## 9.5.2 PROBABLE IMPACTS

### No-Action Alternative

As discussed above, new pests have become established in Hawaii at a steady rate of 20 new pests per year. Agriculture officials increases in statewide air traffic and cargo will increase the potential for introduction of such pests.

The forecast increase in number of direct overseas flights from the U.S. Mainland to Maui will increase the potential for direct and "quicker" pest introductions to Maui. Access is more direct and quicker because the aircraft and passengers do not stop at an intermediary Hawaii airport where the pests could have been detected, left the aircraft or died. Over a period of time, however, a large number of pests are eventually transported to and become established on other neighbor islands.

Kahului Airport with its nearby agricultural lands is a more suitable environment for certain types of pests to become established, than HIA which is surrounded by urban development. The potential for the establishment of certain types of pests, therefore, is generally greater at Kahului Airport than HIA.

State DOA's report to the 1989 State Legislature<sup>15</sup> contained the following comments on the potential impacts of newly established harmful pests or animals:

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<sup>15</sup> "Report To The Fifteenth Legislature, 1989 Regular Session In Response To Requesting the Department of Agriculture to Review Inspection Procedures to Minimize the Introduction of Insect Pests in Hawaii...and...Requesting a Study on the Importation of Non-Domestic Animals and Insect Pests," Department of Agriculture, State of Hawaii

"The establishment of a new crop pest can result in higher produce prices, lower produce quality, greater pesticide usage, increased concern over pesticide residues in the environment, or individuals giving up farming, to name a few. The establishment of an illegal harmful animal could endanger the public or affect the quality of our "outdoors" way of life."

In addition to agricultural lands, important natural areas such as Kanaha Pond and Haleakala National Park could be affected.

#### Proposed Action

An extended Runway 2-20 will enable potential pest introductions from more distant U.S. Mainland locations. The forecast number of daily DC-10 and L-1011 aircraft (U.S. Mainland) operations are the same for the Proposed Action and the Base No-Action Scenario. Compared to the Constrained No-Action Scenario, there could be up to eight more daily DC-10 and L-1011 aircraft operations with the Proposed Action.

#### 9.5.3 POTENTIAL MITIGATION MEASURES

The State DOA's 1989 Report to the Legislature recommended the following measures to mitigate this problem and strengthen their inspection program:

1. Providing additional resource support staff.
2. Providing additional inspectors for increased inspection coverage on all islands. The additional inspections will result in more interceptions with a corresponding decrease in the number of pest and illegal animal introductions.
3. Providing random x-ray machines to effectively detect undeclared plants or animals in baggage.

4. Providing dogs that are trained to sniff out plants and animals.
5. Various procedures, public awareness efforts, and a stricter enforcement program.

The State Legislature has authorized 14 new full-time positions in support of the State DOA's inspection program.

DOT should consider funding assistance to the Federal and State inspection programs to help provide adequate resources to meet the anticipated growth in inspection service requirements.

#### **9.6 RUNWAY 2-20 CLOSURE**

Runway 2-20 could be closed periodically for normal or emergency maintenance, construction, or an aircraft accident. In October, 1989, for example, Runway 2-20 was closed from 10:00 AM to 4:00 PM for emergency repairs when a 20 feet by 20 feet runway section was damaged by a landing B-737 aircraft. The runway was also closed for many hours when Aloha Airlines Flight 243 came to a stop on the runway after losing a portion of its fuselage on a flight from Hilo to Honolulu. During the day, airlines operating at the Airport had to divert incoming flights and reschedule passengers to aircraft using Runway 5-23. If an aircraft accident occurs on the runway, the runway may be closed for up to three days because the debris cannot be moved until Federal safety inspectors complete their investigation.

The new 8,500 foot parallel runway, projected for 2000 to 2010, would provide valuable backup air carrier capability that would allow the Airport to continue most of its normal operations (e.g., passenger and cargo flights) without serious disruptions. This Section discusses the potential impacts to passengers and night cargo operations if Runway 2-20 is closed temporarily and a parallel runway is not constructed.



### 9.6.1 PASSENGERS

If Runway 2-20 is closed for an extended period of time, airlines would need to use Runway 5-23. Runway 5-23 is too short to allow fully-loaded B-737 aircraft to takeoff, and DC-10/L-1011 aircraft could not takeoff at all. Hence, passengers would be inconvenienced if their flights were diverted, delayed, or cancelled due to the limited level of operations on Runway 5-23.

### 9.6.2 NIGHT CARGO OPERATIONS

Aloha Airlines (Aloha) is currently the largest carrier of night cargo to Kahului Airport. Aloha began flying night cargo jets to Kahului Airport in October, 1985. Over the past two years, Aloha nightly cargo volumes have grown at an average rate of five percent per year, and are expected to continue increasing at this rate for the next several years.

Aloha's cargo operations fly every night except Saturday. Incoming cargo typically consists of a variety of perishable food items, newspapers, mail and manufactured goods. Outgoing cargo consists primarily of perishable items such as fruits, vegetables and flowers. In 1991, Aloha transported approximately 90,000 pounds of cargo and mail in and out of Kahului Airport each night.

During the period Runway 2-20 is closed, the impacts to night cargo operations would vary depending on weather conditions. According to Aloha, night cargo flights could operate with some weight restrictions resulting in a reduction in cargo volumes of approximately 15 percent during normal (dry) runway conditions. However, during periods of inclement (wet) weather conditions, night cargo operations would be cancelled because approximately 50 percent of the inbound Maui cargo could not be carried due to payload restrictions.

DOT is planning to close Runway 2-20 from 10:00 PM to 7:30 AM for emergency maintenance repairs and have aircraft operating on Runway 5-23.

## 9.7 REGIONAL ISSUES

In addition to the community's concerns about improvements *on* the Airport discussed in Section 7.2.1, *off*-Airport concerns were expressed during the planning process for Kahului Airport. These *off*-Airport concerns deal with social-economic, infrastructure and public facility issues, which are regional issues that are more appropriately addressed by the County of Maui and not by DOT. These regional issues are presented for discussion purposes only, and are related to the airport improvements under consideration only to the extent that they are affected by the number of visitors and residents who can be accommodated on Maui, and thus the number of passengers that will use the Airport.

### 9.7.1 SOCIAL-ECONOMIC ISSUES

#### Islandwide Concerns

The community has often commented on islandwide concerns about population growth, tourism and hotel development, affordable housing, labor shortage and over-stressed infrastructure systems. These community issues include:

1. The Rapid Pace of Growth and Need for Management. The concern that is central to many community issues on Maui is growth management. Many people believe the County has grown too fast.

2. Resort Development. Major community changes are often directly related to visitor industry growth, and Maui residents view tourism as a double-edged sword. When the Maui County Council discussed the need for a moratorium on further hotel and resort development, the issue found a split community. Those in the visitor industry felt there was a need to slow development but a moratorium or a quota system would be detrimental to the industry. Those favoring the moratorium felt that a temporary slowing mechanism was needed to allow for infrastructure improvements to correct existing deficiencies. A moratorium was passed in April, 1991 and extends through December 1992.
3. Labor Shortage. There is a growing dependency on transitory labor due to labor shortages on Maui. Workers from the mainland and Mexico, for example, have been recruited to supplement harvesting and cannery operations. In-migration of temporary workers may affect a community's stability and cohesion.
4. Affordable Housing. Housing priced for people with average incomes has not been built fast enough. In-migrant hotel employees are currently competing with residents for housing, which increases the pressure for more housing development. A few recent large developments are helping to alleviate the affordable housing shortage, but State studies indicate continued shortages in the future.
5. Infrastructure. From the community's standpoint, infrastructure systems have not improved fast enough. There are regular references to water shortages, sewerage inadequacies, and traffic congestion. Roadway and traffic congestion problems often appear as the top priority on the list of problems to be addressed.

### Forecasts in Relation to Regional Issues

The foregoing issues on Maui's growth rate, resort development, labor shortages, affordable housing, and infrastructure are not related to improvements at Kahului Airport. The DOT forecasts indicate the projects under consideration for Kahului Airport are not expected to affect the growth of the visitor industry, or visitor industry jobs beyond that which are already projected.

The forecast number of passengers are expected to be reached only if the County approves the additional *off-airport* developments that would permit it. *If* the approvals are not granted, passenger traffic will be less than the level the SASP forecasts for 2010. *If* the County of Maui were to decide to accommodate the residents and visitors that generated the projected 9,059,000 passengers, then the number of visitor units, civilian jobs, resident population, and housing units that would be needed to support this growth would increase.

However, in response to comments received on the Draft EIS, a Constrained No-Action Scenario was developed to assess the probable impacts if passenger activity was discouraged due to the existing length of Runway 2-20. As a result, a range of 10 percent was chosen which is discussed in greater detail in Section 2.0.

Based upon the revised passenger forecasts, additional analysis was conducted. The analysis results found that, regardless of the extent of airport improvements, Maui County will not have the facilities needed to support the level of forecast activity at Kahului Airport based on the amount of predictable resort development. The projected level of passenger traffic for 2010, in either the Constrained or the Base No-Action Scenario, will not be realized if the visitor facilities (visitor rooms, golf courses, beach facilities, shopping areas, etc.) and the resort workers do not exist to attract and meet the needs of the projected 4,014,600 visitors to Maui County. Regardless of how many people can be accommodated in the passenger aircraft, airport terminal and on airport runways, the numbers of visitors to Maui will depend on how many can be accommodated on the island once they arrive.

To expand employment on Maui Island to the level needed to meet the 2010 visitor forecast, a large number of people will have to move to Maui. Statewide, DBED has estimated that between 50 and 60 percent of the net change in population between 1990 and 2010 will be from net migration from outside Hawaii (State Department of Business and Economic Development, 1988). The likelihood of such migration taking place would depend on such factors as wages offered and the cost of living, particularly housing, faced by such in-migrants. Without a significant increase in the supply of affordable housing, it could be difficult to recruit sufficient visitor industry employees.

It is further found, however, that even though proposed airport improvements would not directly cause growth, the proposed improvements could have a facilitating effect on Maui County's growth should the County choose to increase the supply of visitor units, etc. The Base No-Action Scenario and Proposed Action forecasts would allow the handling of up to 906,000 more passengers at Kahului Airport in the year 2010 than for the Constrained No-Action Scenario. This means that the improvements could facilitate the passage of 337,600 more visitors than if airport improvements were not made.

As with the previous analysis findings discussed in the Draft EIS, the extent of growth occurring in Maui will ultimately be determined by Maui County. Whether this potential growth is positive or negative depends on the goals and objectives of the County and individual communities. The economic benefits of the additional 9,000 jobs and 2,900 rooms possible under the Proposed Action will be viewed favorably by those who place high value on economic development and who are involved in the visitor industry. The County would also benefit by the increased taxes from an increased tax base and economic activity.

The other effects of growth will likely temper the enthusiasm for more jobs and hotel rooms, however. In the General Plan update and in the current Community Plan Update program, Maui residents are urging public officials to meet the needs of the existing residents before they allow more hotel units and major residential growth. They want to see the road and sewerage systems improved; they want more schools and a more efficient hospital system. Further, the sheer increase in the number of people is seen as a negative impact by many Maui residents; they fear that they are rapidly losing the rural areas, and that Maui is more and more resembling urban areas throughout the country.

#### Kahului Airport's Role in Growth Management

Some people believe an airport functions like a "valve" through which the number of passengers and therefore growth can be controlled. Each airport has a maximum capacity to handle aircraft, passengers and cargo. At Kahului Airport, however, the DOT forecasts show the projected number of passengers in 2010 can be accommodated with existing terminal and runway facilities. Therefore, the Airport would not limit or constrain the number of passengers wanting to travel to or from Maui through the year 2010.

Furthermore, the Airport does not function as an effective growth management tool because the primary reason visitors travel to Maui is for its sun, surf, recreational activities and other attractions and not because of airport facilities. The results of a study conducted by the University of Hawaii entitled Touristic Attractiveness of Hawaii by County<sup>16</sup> further support this by showing that climate, natural beauty, food and lodging, and ocean sports are the top four "attractiveness" criteria for visitors to Maui. Table 9.7.1 shows the report's resulting ranking by attractivity item and score.

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<sup>16</sup> Liu, Juanita C., Ph.D. and Yuyong, Jan, Ph.D., Touristic Attractiveness of Hawaii by County, Occasional Paper No. 10, Sea Grant publication, 1988

Table 9.7.1  
 Touristic Attractivity Table

ATTRACTIVITY SCORES FOR MAUI, 1986

<u>RANK</u>	<u>ATTRACTIVITY ITEM</u>	<u>RANK SUM</u>
1.	Climate	436.5
2.	Natural Beauty	422.5
3.	Food & Lodging Above "Minimal Touristic Quality"	405.5
4.	Ocean Sports	375.0
5.	Land Sports	340.5
6.	Shopping Facilities	310.5
7.	Infrastructure Above "Minimal Touristic Quality"	302.0
8.	Attitudes Towards Tourists	241.5
9.	Nighttime Activities	239.0
10.	Historical Prominence	224.0
11.	Distinctive Local Features	179.0
12.	Festivals, Fairs, and Exhibits	178.0
13.	Facilities Conducive to Health, Rest, and Tranquility	144.0
14.	Ancient Ruins	118.5
15.	Educational Facilities	100.5
16.	Religious Significance	63.0

Source: University of Hawaii Touristic Attractiveness of Hawaii By County, Juanita C. Liu, Ph.D. and Jan Auyong, Ph.D.



During the past twenty years, the resident and visitor populations of Maui have increased significantly, while Kahului Airport has remained relatively unchanged (e.g. length of Runway 2-20). Similarly, Kauai experienced large resident and visitor population increases during the period Lihue Airport was relatively unchanged. Conversely, Hilo's visitor industry has declined despite Hilo International Airport's ability to accommodate longer and more overseas flights than Maui or Kauai.

Therefore, the projected passenger level for Kahului Airport in 2010 will only be realized if there is:

- An adequate "supply" of visitor facilities (visitor rooms, golf courses, beach facilities, shopping areas, etc.); resort workers; and a support system to accommodate the in-migration of new resort workers (especially a reasonable supply of affordable housing for visitor industry workers).
- A continued "demand" for Maui's sun, surf, recreational activities, facilities and amenities.

The County of Maui can manage the growth of Maui's visitor industry by controlling the *supply* aspect of this economic equation. By limiting the supply of hotel rooms, for example, the number of visitors which can be accommodated would be reduced. The lower visitor activity would decrease the need for additional hotel workers, which would reduce the demand for affordable housing. Similarly, limiting the supply of housing would constrain the in-migration of workers needed to support the hotels, and would ultimately affect the hotel industry's ability to service the visitor demand. Thus, regardless of how many passengers can be accommodated at the Airport, the numbers of visitors to Maui would depend on how many can be accommodated on the island when they arrive and leave the Airport. Any decision to limit visitor industry growth should consider the potential economic ramifications of such a decision.

Basically, little can be done to change the *demand* aspect of the economic equation. The projected demand for Maui as a visitor destination is based on a DBED assumption that the U.S. and Japanese economies will perform as expected. Essentially, the demand for vacationing in Hawaii, and thus Maui, is expected to grow at the same rate as their economies. This visitor industry demand would exist, regardless of Maui's supply of visitor accommodations and infrastructure. If Maui limits the supply of rooms, housing, etc., then the demand would be shifted to another destination such as Kona or Kauai.

#### 9.7.2 INFRASTRUCTURE AND PUBLIC FACILITIES

As discussed in the foregoing section, the DOT forecasts indicate the projects under consideration for Kahului Airport are not expected to significantly affect the growth of the visitor industry, or visitor industry jobs. Accordingly, the need for improvements to Maui's infrastructure and public facilities are generally not related to the Proposed Action except as described in this EIS.

Presently, the County of Maui recognizes that many of its infrastructure and public facilities require or will require major improvements in the near future. These current and future infrastructure and public facilities improvements will be needed, even if the improvements at Kahului Airport were not implemented.

The County has prepared various studies of current and projected demands on its infrastructure and public facilities. The Maui County Departments of Planning and Water Supply, for example, have prepared a report entitled Maui County Water Use And Development Plan dated December 1989, that describes the existing water use inventory, and water development plans to meet the projected needs of the County. Similarly, the County Department of Public Works is currently working on a Wastewater Master Plan to address the future sewage demands and facility requirements, and recently completed a 1989 Comprehensive Solid Waste Management Plan to meet its solid waste objectives and requirements. An Island-Wide Long-Range Highway Plan For Maui has also been conducted to plan for and address future transportation facilities to the year 2010. This study was prepared by the State of Hawaii Department of Transportation, Highways Division in cooperation with the County of Maui Planning Department and Department of Public Works.

## **10.0 RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES AND CONTROLS**

The applicable State governmental land use plans, policies and controls affecting the Proposed Action include the Hawaii State Plan, Hawaii Coastal Zone Management Act, and State Functional Plans. The County of Maui's plans, policies and controls include the General Plan, Wailuku-Kahului Community Plan, and the Special Management Area process. The Proposed Action's relationships to these plans, policies and controls are described in this section.

### **10.1 HAWAII STATE PLAN**

The Hawaii State Plan (State Plan), Chapter 226, Hawaii Revised Statutes (HRS), as amended and approved on June 8, 1989, established a set of goals, objectives and policies that are to serve as long-range guidelines for the growth and development of the State. The State Plan is divided into three parts. Part II which pertains to the administrative structure and implementation process of the State Plan is not relevant to this EIS. Parts I and III of the State Plan, which contain the Plan's specific themes, goals, objectives, policies, and priority actions that are directly related to the Proposed Action are discussed below.

The Proposed Action for Kahului Airport is generally consistent with the objectives and policies of the State Plan. The following describes the compatibility of the projects under consideration in relation to the various elements of the State Plan.

#### 10.1.1 Part I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES

The State Plan lists three "Overall Themes" that are considered to be "basic functions of society." These themes are:

- (1) *Individual and family self-sufficiency* which refers to the rights of people to maintain as much self-reliance as possible;
- (2) *Social and economic mobility* which refers to the right of individuals to choose and to have the opportunities for choice available to them; and
- (3) *Community or social well-being* which encompasses values referring to healthy social, economic, and physical environments that benefit the community as a whole.

To guarantee the elements of choice and mobility embodied in the three themes, three goals were formulated.

##### 10.1.1.1 Section 226-4 State Goals

In order to guarantee, for present and future generations, those elements of choice and mobility which insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:

- (1) A strong, viable economy, characterized by stability, diversity and growth that enables fulfillment of the needs and expectations of Hawaii's present and future generations.
- (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems and uniqueness, that enhances the mental and physical well-being of the people.
- (3) Physical, social and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring and of participation in community life.

**Discussion:** The Proposed Action would contribute to the attainment of these goals by creating both short and long-term employment opportunities for residents of Maui, achieving continued reliability associated with increasing import/export cargo services vital to Maui's daily activities, and enhancing transportation services for residents and the visitor industry which is important to the stability of Maui's economy. The Proposed Action would also generate State and County tax revenues which will contribute to economic stability, and government services to the residents and visitors of Maui.

#### 10.1.1.2 Section 226-5 Objectives and Policies for Population

**Objective:** It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.

- Policies:**
- (2) Encourage an increase in economic activities and employment opportunities on the Neighbor Islands consistent with community needs and desires.
  - (3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the State.

**Discussion:** In response to forecast increases in aircraft operations and passenger activity, the Proposed Action has been developed to enable the Airport to operate more efficiently and economically. The Proposed Action is expected to provide long-term employment opportunities for residents, and economic opportunities for businesses providing equipment, supplies and services for aviation-related activities.

10.1.1.3 Section 226-6 Objectives and Policies for the Economy - In General

- Objectives:**
- (1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.
  - (2) A steadily growing and diversified economic base that is not overly dependent on a few industries.

- Policies:**
- (1) Expand Hawaii's national and international marketing, communications and organizational ties to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.
  - (4) Expand existing markets and penetrate new markets for Hawaii's products and services.
  - (6) Strive to achieve a level of construction activity responsive to, and consistent with, State growth objectives.
  - (8) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.
  - (9) Foster greater cooperation and coordination between the government and private sectors in developing Hawaii's employment and economic growth opportunities.
  - (10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.
  - (11) Maintain acceptable working conditions and standards for Hawaii's workers.

**Discussion:** The extension of Runway 2-20 to 9,600 feet will provide increased market opportunities for Maui and other Hawaii businesses to transport their products or services.

The Proposed Action will also generate a significant amount of construction activity through 2010, along with new private jobs in related and secondary activities, that would create opportunities for upward mobility and family economic security. The construction activity would provide steady employment for local construction workers as well as provide employment opportunities for other types of construction trades.

**10.1.1.4 Section 226-8 Objectives and Policies for the Economy-Visitor Industry**

**Objective:** Planning for the State's economy with regard to the visitor industry shall be directed towards achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.

- Policies:**
- (1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.
  - (2) Ensure that visitor industry activities are in keeping with the social, economic and physical needs and aspirations of Hawaii's people.
  - (4) Encourage cooperation and coordination between the public and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.
  - (5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaii's people.



**Discussion:** The Proposed Action would provide the air transportation facilities needed to serve both residents and visitors through 2010. The Proposed Action would provide short- and long-term construction and other employment to residents of Maui. The projects are expected to be carefully designed and developed, with extensive public input, to meet existing and future market demands.

The Master Plan Update Study and FAR Part 150 Noise Compatibility Program are being prepared with extensive public review and coordination through various technical and citizen advisory committees as well as public informational meetings.

**10.1.1.5 Section 226-10 Objectives and Policies for the Economy-Potential Growth Activities**

**Objective:** Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objectives of development and expansion of potential growth activities that serve to increase and diversify Hawaii's economic base.

**Policies:** (1) Facilitate investment and employment in economic activities that have the potential for growth such as diversified agriculture, aquaculture, apparel and textile manufacturing, film and television production and energy and marine-related industries.

**Discussion:** The extension of Runway 2-20 to 9,600 feet will provide increased market opportunities for Maui and other Hawaii businesses to transport their existing products or services, develop new or expanded products or services and increase interest in investment in and outside of Maui.

10.1.1.6 Section 226-14 Objectives and Policies for Facility Systems-In General

**Objective:** Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal and energy and telecommunication systems that support statewide social, economic, and physical objectives.

- Policies:**
- (1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.
  - (2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.
  - (3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.
  - (4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction and maintenance of facility systems.

**Discussion:** The Proposed Action is in response to present and forecast needs; will assist in providing the air transportation facilities required to serve Hawaii's people and visitors; and will be financed through airport bond issues, concession revenues, and airport user fees.

The Master Plan Update Study is part of an ongoing planning process for the Airport intended to accommodate forecast aviation demand while addressing the community's environmental and socio-economic concerns. Growth of Maui's population and economy, particularly the visitor industry, has spurred demand for increased air service at the Airport.

The Master Plan Update Study will recommend a construction phasing plan that will permit flexibility in meeting updated forecasts and other requirements. This built-in flexibility should provide governmental decision-makers with the ability, within reason, for the acceleration or the deceleration of particular improvements deemed appropriate based on actual conditions as they exist and evolve over time. Such an approach will assure that public and private concerns and existing conditions are understood and responded to with all reasoned care.

**10.1.1.7 Section 226-17 Objectives and Policies for Facility Systems-  
Transportation**

- Objectives:**
- (1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.
  - (2) A statewide transportation system consistent with planned growth objectives throughout the State.

- Policies:**
- (1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter.
  - (2) Coordinate state, county, federal and private transportation activities and programs toward the achievement of statewide objectives.
  - (6) Encourage transportation systems that serve to accommodate present and future development needs of communities.
  - (8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs.
  - (9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification.

- (10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment.

**Discussion:** The Proposed Actions are expected to be designed with sensitivity to the needs of affected communities and quality of the area's environment, provide short- and long-term employment, and enhance economic opportunities such as those reflected in an increases in cargo shipments. In addition, the projects would be planned and designed to complement existing and future airport facilities.

Kahului Airport is a major component of the State's multi-modal transportation system. The Proposed Action would accommodate the present and future air transportation needs of Maui, and upgrade the Airport to a more efficient and convenient air transportation facility for the movement of residents, visitors, and cargo.

#### 10.1.1.8 Section 226-18 Objectives and Policies for Facility Systems- Energy/Telecommunications

**Objective:** (2) Increased energy self-sufficiency.

- Policies:**
- (3) Promote prudent use of power and fuel supplies through conservation measures including education and energy-efficient practices and technologies.
  - (4) Ensure that the development or expansion of power systems and sources adequately consider environmental, public health, and safety concerns, and resource limitations.

**Discussion:** An important feature of the ongoing planning process is to ensure adequate, economical and dependable power and telecommunication systems throughout the Airport area. Energy conservation measures are expected to be incorporated into new facilities design through selection of appropriate technologies, equipment and operating practices. Elements of energy conservation that may be incorporated include the use of solar energy for water heating and air conditioning purposes, the use of heat recovery pumps, the use of energy conservation lighting systems, and appropriate landscaping.

### 10.1.2 PART III. PRIORITY GUIDELINES

The purpose of this part of the State Plan is to establish overall priority guidelines to address areas of statewide concern. Section 226-102 of the State Plan notes that the State shall strive to improve the quality of life for Hawaii's present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education. The priority guidelines applicable to the Proposed Action are discussed below.

#### 10.1.2.1 Section 226-103 Economic Priority Guidelines

- (a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy:
- (b) Priority guidelines to promote the economic health and quality of the visitor industry:
  - (1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawaii's residents and visitors.

(f) Priority guidelines for energy use and development:

- (3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.

Discussion: The Proposed Action would assist in meeting the above stated guidelines by providing expanded or new space for businesses (e.g. cargo, commercial aviation, flight kitchen, etc.). With regard to promoting the economic health and quality of the visitor industry, the proposed projects would provide the necessary facilities to minimize inconveniences and foster pleasant airport experiences for visitors and residents. The projects would also aid in the attainment of the energy-related guidelines through the incorporation of energy conservation measures into the design, construction and operation of the facilities.

## 10.2 STATE FUNCTIONAL PLANS

The State Plan directs appropriate State agencies to prepare functional plans for their respective program areas. There are twelve State Functional Plans which serve as the primary implementing vehicle for the goals, objectives and policies of the State Plan. The following sections discuss the currently adopted State Functional Plans which are applicable to the Proposed Action.

The major theme for these functional plans focuses on the promotion of a balanced growth approach in the use of our limited resources. This recognizes the need for economic development while preserving the environment and multi-cultural lifestyles throughout the State.

## 10.2.1 STATE TRANSPORTATION FUNCTIONAL PLAN

The 1991 State Transportation Functional Plan identified the following critical issues of transportation: congestion, economic development, funding and education. The following objectives and policies of the 1991 State Transportation Functional Plan apply specifically to the Proposed Action.

**Objective:** (I.A) Expansion of the transportation system.  
**Policy:** (I.A.1) Increase transportation capacity and modernize transportation infrastructure in accordance with existing master plans and laws requiring accessibility for people with disabilities.

**Discussion:** The Proposed Action will provide the facilities needed to accommodate the present and future needs at Kahului Airport, and is based on the findings of a Master Plan Update Study.

**Objective:** (I.D) Identification and reservation of lands and rights-of-way required for future transportation improvements.  
**Policy:** (I.D.1) Identify, reserve and/or acquire land for future transportation improvements.

**Discussion:** The Recommended Plan identifies the lands which should be acquired for the Proposed Action, and future improvements (beyond 2010).

**Objective:** (II.A) Development of a transportation infrastructure that supports economic development initiatives.  
**Policy:** (II.A.3) Support agriculture and agricultural initiatives.

**Discussion:** The Proposed Action's new air cargo facilities and extension of Runway 2-20 to 9,600 feet will provide more efficient facilities and market opportunities for agricultural and other products and services.

## 10.2.2 STATE HISTORIC PRESERVATION FUNCTIONAL PLAN

The objectives, policies and implementing actions in the 1991 Historic Preservation Functional Plan are intended for implementation by the State Department of Land and Natural Resources and affiliated State agencies. The project area has been reviewed and surveyed, and a description of identified historic and archaeological sites is included in the EIS. Recommendations are included for the disposition of sites identified as significant for cultural, scientific or educational value. Implementation of the Proposed Action will require the preparation of an Historic Sites Mitigation Plan to ensure its conformance with all applicable State, County, and Federal regulations concerning historic sites.

## 10.2.3 STATE TOURISM FUNCTIONAL PLAN

The following major objectives of the 1991 State Tourism Functional Plan reflect the need to find a balance among economic, social, and environmental issues:

- Achievement of steady and balanced growth of the visitor industry hand in hand with infrastructure improvements;
- Development and maintenance of a well-designed, high quality visitor product;
- Respect for, and preservation and maintenance of the fragile resources which comprise Hawaii's natural environment and cultural heritage;
- Support of Hawaii's diverse range of lifestyles;
- Maintenance of a productive workforce which has opportunities for upward mobility and increases in real income;
- Maintenance of a high consumer awareness of Hawaii as a visitor destination in desired markets; and
- Maintenance of visitor markets to support desired levels of economic activity, and diversification of markets to provide a secure economic base.



The following objective and policy applies specifically to the Proposed Action.

**Objective:** (II.A) Development and maintenance of well-designed visitor facilities and related developments which are sensitive to the environment, sensitive to neighboring communities and activities, and adequately serviced by infrastructure and support services.

**Policy:** (II.A.1) Maintain high standards of overall quality of existing visitor destination and attraction areas.

**Discussion:** The Proposed Action is designed to meet the present and forecast air transportation needs of both residents and visitors. The Proposed Action will provide safe, efficient, economical, and convenient air transportation facilities through the year 2010.

#### 10.2.4 STATE AGRICULTURAL FUNCTIONAL PLAN

The mission of the 1991 State Agricultural Functional Plan is to "increase the overall level of agricultural development in Hawaii, in accordance with the two fundamental Hawaii State Plan objectives for agriculture: continued viability in Hawaii's sugar and pineapple industries, and continued growth and development of diversified agriculture throughout the State." The following objectives and policies are applicable to the Proposed Action.

**Objective:** (F) Achievement of increased agricultural production and growth through pest and disease controls.

**Policy:** (F.1) Manage present populations, and prevent further introductions, of destructive and harmful insects, plants, animals, plant and animal diseases, and other pests in the State.

**Discussion:** The Proposed Action is not expected to increase the potential for the introduction of pests and diseases. Increased public awareness, inspection efforts, and Integrated Pest Management measures will help to minimize introductions and impacts in the future.

**Objective:** (L) Achievement of adequate transportation services and facilities to meet agricultural needs.  
**Policy:** (L.2) Provide adequate air and surface terminal facilities to meet present and future agricultural needs.

**Discussion:** The Proposed Action provides for expanded air cargo facilities to more efficiently transport current and future agricultural products and other non-agricultural goods.

#### 10.2.5 STATE RECREATION FUNCTIONAL PLAN

The 1991 State Recreation Functional Plan is divided into six issue areas: ocean and shoreline recreation; mauka, urban, and other recreation opportunities; public access to the shoreline and mauka recreation areas; resource conservation and management; management of recreation programs, facilities, and areas; and wetlands protection and management. The following objective and policy apply to the Proposed Action.

**Objective** (III.A) Prevent the loss of access to shoreline and upland recreation areas due to new developments.  
**Policy:** (111.A.1) Require land use permit applications to fully address the impact of their projects on trails and public access.

**Discussion:** The Proposed Action will not affect current access to Kanaha Beach Park or otherwise diminish access to shoreline and upland recreational areas.

The Kanaha Beach Park Improvement project will increase the amount of developed park land accessible for public use and provide two separate beach park facilities to help relieve overcrowded conditions. Also, all required land use permits will be applied for and obtained.

#### 10.2.6 STATE ENERGY FUNCTIONAL PLAN

The 1991 State Energy Functional Plan identified three major strategies to achieve the objectives of the Hawaii State Plan. These strategies are as follows: (1) reduce the State's dependency on petroleum and other fossil fuels; (2) develop an integrated approach for more effective energy development and management; and (3) take action to ensure an adequate and timely supply of the national Strategic Petroleum Reserve.

When the projects in the Proposed Action are designed, it is expected that they will incorporate energy conservation measures whenever possible. Elements of energy conservation that may be incorporated include the use of solar energy for water heating and air conditioning purposes, the use of heat recovery pumps, the use of energy conservation lighting systems, and appropriate landscaping.

#### 10.2.7 STATE HEALTH FUNCTIONAL PLAN

The 1989 State Health Functional Plan identifies four major priority issue areas on which the plan focuses. These issue areas are: (1) preventive health; (2) access to health care; (3) environmental protection; and (4) internal administrative issues. Of these four, access to health care and the environmental protection issue are the most relevant to the Proposed Action.

The Proposed Action will be in compliance with applicable DOH environmental protection rules and regulations as well as those established by Federal and County agencies. In addition, applicable DOH permit/approval requirements will be complied with. The Proposed Action will aid the normal and emergency transportation of persons from Maui to health care centers on Oahu.

#### 10.2.8 STATE HUMAN SERVICES FUNCTIONAL PLAN

The 1989 State Human Services Functional Plan identifies elderly care, children and family support, self-sufficiency, and service delivery improvements as priority issues.

The Proposed Action supports the Human Services Functional Plan by assisting individuals and families in achieving economic self-sufficiency through increased employment opportunities.

#### 10.2.9 STATE EMPLOYMENT FUNCTIONAL PLAN

The 1989 State Employment Functional Plan lists the following major objectives: (1) improve the qualifications of entry-level workers and their transition to employment; (2) develop and deliver education, training and related services to ensure and maintain a quality and competitive workforce; (3) improve labor exchange; (4) improve the quality of life for workers and families; and (5) improve planning of economic development, employment and training activities.

The Proposed Action is generally in concert with these objectives by providing increased local employment opportunities and contributing to improving the quality of life for workers and families.

**10.2.10 COASTAL ZONE MANAGEMENT ACT (CHAPTER 205-A, HRS)**

The objectives of the Hawaii Coastal Zone Management (CZM) Program outlined in Chapter 205-A, Hawaii Revised Statutes, are to protect and maintain valuable coastal resources.

The Proposed Action conforms to and supports the Hawaii CZM Program's objectives to protect and maintain valuable coastal resources by maintaining access to the shoreline, improving Kanaha Beach Park facilities and not adversely impacting nearby coastal resources.

**10.3 COUNTY OF MAUI**

**10.3.1 GENERAL PLAN OF THE COUNTY OF MAUI**

The General Plan of the County of Maui, 1990 Update, (General Plan) became effective on September 27, 1991.

The Maui County Charter requires that the General Plan "...shall recognize and state the major problems and opportunities concerning the needs and the development of the county and the social, economic and environmental effects of such development and shall set forth the desired sequence, patterns and characteristics of future development."

The General Plan identifies the following five major themes: (1) Protect Maui County's agricultural land and rural identity; (2) Prepare a directed and managed growth plan; (3) Protect Maui County's shoreline and limit visitor industry growth; (4) Maintain a viable economy that offers diverse employment opportunities for residents; (5) Provide for needed resident housing. The following objectives and policies are related to the Proposed Action.

- Objective: (1.A.1) To plan the growth of resident and visitor population through a directed and managed growth plan so as to avoid social, economic and environmental disruptions.
- Policies: (1.b) Balance population growth by achieving concurrency between the resident employee work force, the job inventory created by new industries, affordable resident/employee housing, constraints on the environment and its natural resources, public and private infrastructure, and essential social services such as schools, hospitals, etc.
- (1.c) Maintain a balance between resident and visitor population by controlling and regulating growth of visitor facilities.

**Discussion:** Section 9.7 of this EIS discusses the limited relationship between the Proposed Action and the infrastructure, public facilities, and growth issues on Maui.

- Objectives:**
- (I.B.1) To preserve for present and future generations existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land in accordance with the individual character of the various communities and regions of the County.
  - (I.B.3) To preserve lands that are well suited for agricultural pursuits.
- Policies:**
- (1.c) Identify and preserve significant historic and cultural sites.
  - (3.a) Protect prime agricultural lands from competing non-agricultural land uses.
  - (3.d) Discourage the conversion, through zoning or other means, of productive or potentially productive agricultural lands to non-agricultural uses, including but not limited to golf courses and residential subdivisions.

**Discussion:** Significant historic and cultural sites have been identified in Section 6.3 of this EIS, and an appropriate mitigation plan will be developed to ensure conformance with all applicable County, State and Federal requirements. Section 5.1 discusses the probable impacts on agricultural lands by the Proposed Action.

- Objectives:** (I.C.1) To preserve and protect the County's unique and fragile environmental resources.
- (I.C.2) To use the County's land-based physical and ocean-related coastal resources in a manner consistent with sound environmental planning practice.
- Policies:** (1.b) Preserve scenic vistas and natural features.
- (1.e) Discourage the introduction of noxious foreign species into Maui County's unique island ecosystems.
- (2.a) Preserve, enhance and establish traditional and new environmentally sensitive access opportunities for mountain and ocean resources.
- (2.b) Evaluate all land based development relative to its impact on the County's land and ocean ecological resources.

**Discussion:** Visual resources are identified and analyzed in Section 5.4 of this EIS, and the potential for introduction of plant pests and animals is discussed in Section 9.5. The Proposed Action will not affect current access to Kanaha Beach Park, nor adversely affect the water quality of Kanaha Pond Wildlife Refuge, Kanaha Beach Park and the surrounding ocean waters.

- Objective:** (I.D.1) To preserve for present and future generations the opportunity to know and experience the arts, culture and history of Maui County.
- Policies:** (1.b) Encourage the recordation and preservation of all cultural and historic resources, to include culturally significant natural resources.
- (1.e) Identify and maintain an inventory of significant and unique cultural resources for special protection.



**Discussion:** Significant historic and cultural sites have been identified in Section 6.3 of this EIS, and an appropriate mitigation plan will be developed to ensure conformance with all applicable County, State and Federal requirements.

- Objectives:**
- (II.A.1) To provide an economic climate which will encourage controlled expansion and diversification of the County's economic base.
  - (II.A.2) To provide a balance between visitor industry employment and non-visitor employment for a broader range of employment choices for the County's residents.
- Policies:**
- (1.a) Maintain a diversified economic environment compatible with acceptable and consistent employment.
  - (2a) Encourage industries that will utilize the human resources available from within Maui County rather than having to import workers.

**Discussion:** A longer runway would enable Maui's exporters of flowers, fruits, vegetable and other products to ship non-stop to more distant markets and thus to increase their own productivity, income and demand for services. Non-stop flights to the Mid-West, for example, would allow farmers to by-pass the restrictions that California has placed on the importation of some locally grown produce. Improved cargo facilities would facilitate the processing, pick-up, and delivery of various products. All of these effects would encourage the utilization of indigenous Maui residents.

The Proposed Action also will provide new employment opportunities for the local construction industry and aviation-related businesses.

- Objective:**
- (II.B.1) To encourage exceptional and continuing quality in the development of visitor industry facilities.

**Policy:** (1.f) Encourage the use of local manpower in the construction of visitor facilities, and the use of local manpower at facilities at all employment levels including management in the operation of those facilities.

**Discussion:** The Proposed Action will provide those facilities needed to provide high levels of service to resident and visitor passengers, and other airport users at Kahului Airport. The Airport Access Road, for example, would improve traffic conditions around the Airport for both residents and visitors.

The Proposed Action also will provide employment opportunities for the local construction industry and aviation-related businesses.

**Objective:** (II.C.1) To foster growth and diversification of agriculture and aquaculture throughout Maui County.

**Policies:** (1.b) Support and promote programs to maintain the viability of diversified agriculture, specialty crops, forestry and aquaculture.

(1.d) Seek improved methods of exporting Maui County agricultural products to off island consumers.

**Discussion:** See the above discussion on economic activity.

**Objectives:** (IV.A.1) To support an advanced and environmentally sensitive transportation system which will enable people and goods to move safely, efficiently and economically.

(IV.A.2) To develop a program for anticipating and enlarging the local street and highway systems in a timely response to planned growth.

- Policies:**
- (1.a) Prohibit internationalization of Kahului Airport and maintain current and future runway lengths to no more than 7,000 feet and discourage lengthening of the Kapalua-West Maui Airport runway.
  - (1.b) Encourage the development of more efficient water and air transportation systems.
  - (1.c) Support environmentally sensitive development or modernization of major transportation facilities such as new harbors and airports when they are needed by our residents.
  - (1.e) Seek an efficient and economical means of transporting local agricultural products to major off-island markets.
  - (2.b) Ensure that transportation facilities are anticipated and programmed for construction in order to support planned growth.

**Discussion:** The objective of the Proposed Action - to insure that safe, efficient, economical, convenient, air transportation facilities are available to the residents and visitors of Maui through the year 2010 - supports and advances the County's transportation objectives and policies.

The above policy to "maintain current and future runway lengths to no more than 7,000 feet" at Kahului Airport, however, conflicts with plans to extend the existing runway to 9,600 feet within the next five years and to construct a parallel runway of 8,500 feet between 2000 and 2010. The policy to limit Kahului Airport's runway lengths appears to contradict, conflict with or impede the attainment of other County transportation objectives and policies that support the development of a more efficient air transportation system, including the efficient and economical transportation of local agricultural products to major off-island markets. The Proposed Action would also provide new and reasonable employment opportunities for Maui residents and provide stable increase in local revenues through jobs and taxes.

The Airport Access Road would improve traffic conditions on the roads surrounding the Airport in support of the ground transportation objective.

- Objective:** (IV.D.1) To make Maui County more self-sufficient in its need for non-renewable energy and more efficient in its use of energy.
- Policy:** (1.e) Seek to incorporate energy-saving building design concepts and devices in government buildings.

**Discussion:** When the projects in the Proposed Action are designed, it is expected that they will incorporate energy conservation measures whenever possible. Elements of energy conservation that may be incorporated include the use of solar energy for water heating and air conditioning purposes, the use of heat recovery pumps, the use of energy conservation lighting systems, and appropriate landscaping.

- Objectives:** (V.B.1) To provide high-quality recreational facilities to meet the present and future needs of our residents of all ages and physical ability.
- (V.B.2) To provide a wide range of recreational, cultural and traditional opportunities for all our people.
- Policies:** (1.a) Maintain and upgrade existing recreational facilities to meet community needs.
- (2.e) Encourage the identification, restoration, and preservation of important archaeological, historical and cultural sites.

**Discussion:** Section 8.9 discusses recreational facilities near the Airport.

Significant historic and cultural sites have been identified in Section 6.3 of this EIS, and an appropriate mitigation plan will be developed to ensure conformance with all applicable County, State and Federal requirements.

### 10.3.2 WAILUKU-KAHULUI COMMUNITY PLAN AND COUNTY ZONING

An amendment to the Wailuku-Kahului Community Plan and the County Zoning Map will be required for all areas to be developed that are not currently designated in accordance with the proposed use. The Proposed Action may require Community Plan and zoning designation changes for the following improvements:

- The 8,500 foot parallel runway will require a land use designation change from "Agriculture" to "Airport," and will probably require a land use designation change from "Open Space" to "Airport" for part of East Spreckelsville on the north side of Hana Highway.
- The new connecting taxiways to the parallel runway, commercial aviation lease lots, and general aviation T-hangars will probably require a land use designation change from "Agriculture" to "Airport."

### 10.3.3 SPECIAL MANAGEMENT AREA

A Special Management Area (SMA) Use Permit is required for all projects within the SMA boundary including the following projects:

- Strengthening of existing Runway 2-20.
- New Airport Access Road on the northern side of Hana Highway.
- Improvements to the terminal area complex (e.g., cargo facility, parking, and commuter terminal).
- Parallel runway and connecting taxiways.
- Improvements between Runway 2-20 and the parallel runway (e.g., general aviation T-hangars, commercial aviation lease lots, scenic air tour facility, and new East Ramp access road).
- Improvements to the north of Runway 5-23 (e.g., Kanaha Beach Park improvements, relocated VORTAC, and large transient aircraft parking apron).
- Improvements adjacent to Keolani Place (e.g. ground transportation subdivision, flight kitchen, bulk jet fuel storage facility, and fuel line.

#### **10.4 STATE LAND USE DESIGNATIONS**

691 acres of lands currently zoned Agricultural Land Use District will need to be reclassified to Urban Land Use District by the State Land Use Commission.

#### **10.5 FEDERAL AVIATION ADMINISTRATION**

Implementation of some of the Proposed Action improvements (runway extension and strengthening, parallel runway, taxiways, relocation of navigational aids, Airport Access Road and land acquisition) requires the approval of the FAA and compliance with the National Environmental Policy Act. Upon completion of the Master Plan Update Study, a revised Kahului Airport Layout Plan and Airport Airspace Plan will be submitted for approval to the FAA.

## 11.0 RELATIONSHIP BETWEEN SHORT-TERM USES AND MAINTENANCE OF LONG-TERM PRODUCTIVITY

No short-term exploitation of resources that will have negative long-term consequences have been identified. The Proposed Action, with the exception of the five actions recommended in the next five years, will be developed over a twenty year period and will be designed and constructed to last for decades. The principal long-term benefits of the projects include the productive use of the property, and the provision of air and ground transportation facilities and commercial facilities that will better serve Maui residents and visitors for many years. The Proposed Action is a logical extension of the airport urban area.

Foregoing and/or delaying all of the improvements would mean less than optimum use of the facilities and would result in lower levels of passenger and cargo service and convenience. The Airport Access Road, for example, would relieve traffic congestion along Keolani Place and Dairy Road for both residents and visitors.

## 12.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Construction of the Proposed Action would result in the irreversible and irretrievable commitment of certain natural and fiscal resources. Major resource commitments include the agricultural and residential lands which would be acquired, as well as public funds, construction materials, manpower, and energy. These commitments must be weighed against the projected benefits to be derived from the projects, or the consequences of taking no action, or implementing other less beneficial uses of the project site.

The commitment of resources required to accomplish the projects includes large quantities of building materials and labor, both of which are generally nonrenewable and irretrievable. Construction of the Proposed Action and resultant travel to/from the Airport by residents and visitors, would require the consumption of petroleum products and petroleum-based electrical generation. This also represents an irretrievable commitment of resources.

The Proposed Action does not call for a significant commitment of government supplied services or facilities that would not be required without the projects. The Proposed Action would add to the air and ground transportation, air cargo and commercial facilities available to the residents and visitors of Maui and the State. Similarly, the Proposed Action would help contribute additional tax revenues to the County and State.



### 13.0 OFFSETTING CONSIDERATIONS OF GOVERNMENTAL POLICIES

By the very existence of a complex system of land use policies, plans, goals, objectives and controls at both the State and County levels of government, development proposals are often faced with inherent contradictions and conflicts within the land use regulatory system. As such, the Proposed Action must be reconciled against those privately and publicly planned elements that may conflict with it. As indicated in Section 11.0, the Proposed Action is generally consistent with and supportive of the Hawaii State Plan and various State Functional Plans. The General Plan of the County of Maui, however, has a policy which is contrary to two runway projects.

The County's policy to "maintain current and future runway lengths to no more than 7,000 feet" at Kahului Airport, conflicts with plans to extend the existing runway to 9,600 feet and to construct a parallel runway of 8,500 feet. The policy to limit Kahului Airport's runway lengths appears to contradict, conflict or impede the attainment of other County transportation objectives and policies that support the development of a more efficient air transportation system, including the efficient and economical transportation of local agricultural products to major off-island markets, as well as other employment and long-term planning objectives. Further, the objective of the Proposed Action - to insure that safe, efficient, economical, convenient, air transportation facilities are available to the residents and visitors of Maui through the year 2010 - supports and advances the County's transportation objectives and policies, as well as numerous other objectives and policies identified in the Plan.

#### 14.0 UNRESOLVED ISSUES

DOT is aware of Maui's governmental and public concerns, described through the EIS, regarding the Proposed Action. The General Plan of the County of Maui includes a policy to "prohibit internationalization of Kahului Airport and maintain current and future runway lengths to no more than 7,000 feet." In response to the County's concern about "internationalization," DOT has decided not to construct an International Arrivals Facility through 2010. DOT believes that such a decision diminishes some of the apprehensions expressed in the General Plan. With respect to the provision to maintain the current runway length to 7,000 feet, DOT continues to believe that for purposes of efficiency, enhanced safety, technological changes in the industry and economic livelihood of the State, a 7,000 foot runway is no longer adequate or prudent. Nonetheless, in the EIS - in order to be responsive to the County - the effects of a No-Action Alternative was examined. DOT committed to continue to working with the various governmental agencies and public organizations that have such concerns during the planning and implementation of the Proposed Action. Such opportunities, as well as the opportunity for additional public review, will occur as the Recommended Actions requiring FAA approval are reviewed in the Federal EIS process and as permits and approvals are sought.

## 15.0 CONSULTED PARTIES

### 15.1 ENVIRONMENTAL ASSESSMENT AND EIS PREPARATION NOTICE

The notice of availability of the Kahului Airport Master Plan Update Environmental Assessment and EIS Preparation Notice (Preparation Notice), dated June, 1990, was published in the OEQC Bulletin by the Office of Environmental Quality Control on July 8, 1990. The agencies, organizations and individuals listed below were sent copies of the Preparation Notice or requested to be consulting parties. Copies of correspondence with parties requesting to be consulted or who had substantive comments are reproduced in Appendix A.

#### FEDERAL AGENCIES

U. S. Department of Transportation  
Federal Aviation Administration

U.S. Department of the Interior  
Fish and Wildlife Service

U. S. Department of the Interior  
Geological Survey, Water Resources

U.S Army Corps of Engineers  
Environmental Resources Section

U.S. Department of Agriculture  
Soil Conservation Service

CINCPAC

Advisory Council on Historic Preservation

#### STATE AGENCIES

Department of Transportation  
Office of Environmental Quality Control  
State Land Use Commission  
Department of Hawaiian Home Lands  
Office of Hawaiian Affairs

Department of Agriculture  
Office of State Planning  
Department of Defense  
Deputy Attorney General  
Department of Health

Department of Land and Natural Resources  
Department of Accounting and General Services  
Department of Business, Economic Development & Tourism  
Governor's Agriculture Coordinating Committee  
High Technology Development Corporation  
University of Hawaii Environmental Center  
The Honorable Senator Lehua Fernandes Salling  
The Honorable Senator Mamoru Yamasaki  
The Honorable Senator Malama Solomon  
The Honorable Senator Rick Reed  
The Honorable Representative Joseph M. Souki  
The Honorable Representative Paul T. Oshiro  
The Honorable Representative Mark J. Andrews  
The Honorable Representative Michael O' Kieffe  
The Honorable Representative Herbert J. Honda  
The Honorable Representative Rosalyn Baker

COUNTY OF MAUI

The Honorable Linda Crockett Lingle, Mayor  
The Honorable Hannibal M. Tavares, former Mayor  
Maui County Council  
Department of Water Supply  
Department of Human Concerns  
Department of Parks and Recreation  
Maui Police Department  
Department of Public Works  
Office of Economic Development  
Department of Planning

INDIVIDUALS AND ORGANIZATIONS

Hawaii Audubon Society  
Century Aviation, Inc.  
Sierra Club, Maui Group  
Aloha Activity Center  
Hawaii State Teachers Association  
Kahumanu Merchants Association  
Kaanapali Beach Operators Association  
Maui Chamber of Commerce  
Outdoor Circle  
Sierra Club, State Office  
American Institute of Architects  
Maui Contractors Association  
Maui Nurses Association  
Kahului Town Association

Airline Pilots Association  
A & B Properties, Inc.  
Maui Hotel Association  
Maui Tomorrow  
Hui Alanui O Makena  
Aloha Airlines  
United Airlines  
American Airlines  
Tanaka Engineers, Inc.  
Hawaii Society of Professional Engineers  
GTE Hawaiian Telephone  
Maui Board of Realtors  
Maui Mall Merchants Association  
Maui Home Economic Association  
Maui Retired Teachers Association  
National Exchange Club of Maui  
Haliimaile Community Association  
Central Maui Hawaiian Civic Club  
Council of Maui Community Association  
Haiku Area Community Action Council  
American Lung Association of Hawaii  
Maui Air Traffic Association, Inc.  
Hana Improvements Association  
Knights of Columbus  
Kula Kai Community Association  
Makawao Community Association  
Maui Filipino Community Council  
Maui Memorial Hospital Auxiliary  
Maui Okinawan Kenjin Kai  
West Maui Cultural Council  
West Maui Taxpayers Association  
Waihee Community Association  
Maui District PTSA  
AFL-CIO  
Maui Economic Opportunity

Airlines Committee of Hawaii  
American Flyers Club, Inc.  
Na Mele O Maui  
Maui Visitors Bureau  
Maui Planters Association  
Hawaiian Airlines  
Delta Airlines  
Project Managers Hawaii, Inc.  
Pacific Resources, Inc.  
Maui Electric Co., Ltd.  
Maui County Farm Bureau  
Maui Farmers Coop Exchange  
Maui Whalewatchers  
Maui Postmasters Association  
Paia Business Association  
Maui Vegetable Growers Coop  
Professional Secretaries, Intl.  
Civil Air Patrol  
Jaycees  
Friends of the Library  
Sierra Club Legal Defense Fund,  
Haiku Community Association  
Kihei Community Association  
Kiwanis Club  
Lahaina Civic Club  
Maui Lions Club  
Maui Chinese Club  
Maui Womens Club  
Maui Portugese Chapter  
Paia Community Association  
Rotary Club of Maui  
United Public Workers. Local 646  
ILWU Local 142  
American Red Cross  
Alu Like

J. Walter Cameron Center	Maui Kokua Services, Inc.
Kula Elementary School PTA	Kihei School PTA
Kalama Intermediate School PTA	Lahaina Intermediate PTA
Susan A Kusunoki	Lucy Feinberg
Clint Makekau	Elaine S. Wender
Sandi Topp	Bob Vogele
Paula Dunaway	Frederick Rohlfing
Leland Schulenburg	Richard Perrie, M.D.
Carolyn Damon	Paula Dunaway
Isaac D. Hall	Dana Naone Hall
William D. Smith	The Reverend David J. Baar
Douglas B. Cameron	Claude Moreau
Celeste N. King, Ph.D.	V. Lee Fuqua
Arnold L. Lum	Francis X. Blackwell
Renee-May Kehaulani Filimoea'tu	John Bose II.
Burt Sakata	Sandi Topp
Elaine S. Wender	Lisa Hamilton
Cliff Ahue	Hans Rickie
Stephen J. Pitt	Dr. Gassmann DuVall
Susan Jenson	Gregory Westcott
Masako Westcott	Jack Thompson
Sherry Pollock	James A. Bendon, M.D.
Lesley Ann Bruce	Terry A. Lynch
Richard D. Mayer	Sheryl Roberts
Mark Roberts	Joel E. Richman
George M. Kaimiola	
NA HOALOHA O LELE	
AMFAC Properties Investment Corporation	
Hawaii Government Employees Association, Local 152	
Keanae-Wailua Nui Community Association	
International Brotherhood of Electrical Workers, Local 1260	
State of Hawaii Organization of Police Officers	
Wailuku Business Community Association	
Maui Automobile Retail & Gasoline Dealers Association	
Maui Business and Professional Womens Club	

Wai-Kuhu Business and Professional Womens Club  
American Association of Retired Persons, Maui Chapter  
Kahului Airport Technical Advisory Committee  
Kahului Airport Advisory Committee  
Kahului Airport Ad Hoc Committee  
American Association of University Women, Maui Chapter  
Hawaii Helicopter Operators Association  
Lahaina Shopping Center Business Association

## **15.2 DRAFT EIS**

The notice of availability of the Kahului Airport Master Plan Update Draft EIS dated September, 1991, was published in the OEQC Bulletin by the Office of Environmental Quality Control on September 8, 1991. The following agencies, organizations, and individuals submitted comments on the Draft EIS. Their comment letters and corresponding DOT response letters are included in Appendix A.

### **FEDERAL AGENCIES**

U.S Army Corps of Engineers  
U.S. Department of Agriculture, Soil Conservation Service  
U.S. Department of Navy  
U.S. Department of Interior, National Parks Service

### **STATE AGENCIES**

Department of Accounting and General Services  
Department of Agriculture  
Department of Business, Economic Development & Tourism  
Department of Defense  
Department of Health  
Department of Land and Natural Resources  
Department of Transportation  
Housing and Finance Development Corporation

Office of State Planning  
Office of Environmental and Quality Control  
State Land Use Commission  
University of Hawaii Environmental Center

COUNTY OF MAUI

Department of Water Supply  
Department of Public Works  
Maui County Council  
Maui County Council Member Vincent Bagoyo  
Maui County Council Member Alice Lee  
Maui County Cultural Resources Commission

INDIVIDUALS AND ORGANIZATIONS

Activity Owners Association of Hawaii  
Alexander & Baldwin Hawaii, Inc.  
American Institute of Architects-Maui Chapter  
Airline Pilots Association  
Abraham Aki  
AlexAir  
Bren Bailey  
James A. Bendon, M.D.  
Wendy Blair  
Lesley Ann Bruce  
Business Equipment Co., Inc.  
Alan Cadiz  
Eve Clute  
Carolyn Damon  
Liane Endo  
Friends of the Hana Coast  
Dr. Renate Gassmann DuVall  
Carl Freedman (Haiku Design & Analysis)  
Donald & Barbara Guild



Greg Godwin  
Haiku Community Association  
Dana Naone Hall  
Isaac D. Hall  
Hui Alanui O Makena  
Lisa Hamilton  
Hana Community Association  
Hawaii Audubon Society  
Hawaii La' Ieikawai Association, Inc.  
Marc Hodges  
Margaret Jenkins  
Brian Jenkins  
Kaanapali Beach Hotel  
Keith Kokos  
Richard J. Lafond  
Richard Larson  
Barbara Luke  
Maalaea Community Association  
Nicholas Martin  
Maui Air Traffic Association, Inc.  
Maui Cultural Resources Commission  
Maui Hotel Association  
Maui Radiology Consultants  
Maui Recycling Group  
Maui Software  
Maui Tomorrow  
Richard D. Mayer  
Mary J. McBarnet  
Jody Mitchell  
Cyrus & Jill Monroe  
Dr. Steven M. Moser  
Napili Kai Beach Club  
Outdoor Circle  
Robert Perlman  
John M. Perry

Carolyn Richardson  
Frederick Rohlfing  
Anne Sakutori  
Daniel E. Scheper  
Leland & Kay Schulenburg  
John & Louise Severson  
Sierra Club-Maui Group  
Rita Silva  
Leslie Skilings, Jr.  
William D. Smith  
Spreckelsville Community Association  
Jack Thompson  
Tropical Orchid Farm  
Masako Westcott  
Westin Maui  
Robert & Barbara Woods

**16.0 ORGANIZATIONS AND INDIVIDUALS WHO ASSISTED  
IN THE PREPARATION OF THIS EIS**

**Pacific Planning & Engineering, Inc.**

Jonathan K. Shimada	Principal in Charge
Alvin K. U. Chong	Project Manager
Ronald A. Sato	Planner
Alyssa Miller	Planner

**Belt Collins & Associates**

Perry J. White	Senior Planner
----------------	----------------

**Aries Consultants Ltd.**

R. John Sanders	President
George W. Antis	Airport Planner

**Subconsultants**

Air Quality	Woodward-Clyde Consultants
Historic & Cultural	Cultural Surveys Hawaii
Fauna	Mr. Phillip L. Bruner
Flora	Char & Associates
Noise	Y. Ebisu & Associates
Socio-Economic	Earthplan
Traffic	Pacific Planning & Engineering, Inc.
Water Quality	AECOS

# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING

Greg Godwin  
Haiku Community Association  
Dana Naone Hall  
Isaac D. Hall  
Hui Alanui O Makena  
Lisa Hamilton  
Hana Community Association  
Hawaii Audubon Society  
Hawaii La' Ieikawai Association, Inc.  
Marc Hodges  
Margaret Jenkins  
Brian Jenkins  
Kaanapali Beach Hotel  
Keith Kokos  
Richard J. Lafond  
Richard Larson  
Barbara Luke  
Maalaea Community Association  
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Maui Cultural Resources Commission  
Maui Hotel Association  
Maui Radiology Consultants  
Maui Recycling Group  
Maui Software  
Maui Tomorrow  
Richard D. Mayer  
Mary J. McBarnet  
Jody Mitchell  
Cyrus & Jill Monroe  
Dr. Steven M. Moser  
Napili Kai Beach Club  
Outdoor Circle  
Robert Perlman  
John M. Perry

Carolyn Richardson  
Frederick Rohlfing  
Anne Sakutori  
Daniel E. Scheper  
Leland & Kay Schulenburg  
John & Louise Severson  
Sierra Club-Maui Group  
Rita Silva  
Leslie Skilings, Jr.  
William D. Smith  
Spreckelsville Community Association  
Jack Thompson  
Tropical Orchid Farm  
Masako Westcott  
Westin Maui  
Robert & Barbara Woods

**16.0 ORGANIZATIONS AND INDIVIDUALS WHO ASSISTED  
IN THE PREPARATION OF THIS EIS**

**Pacific Planning & Engineering, Inc.**

Jonathan K. Shimada	Principal in Charge
Alvin K. U. Chong	Project Manager
Ronald A. Sato	Planner
Alyssa Miller	Planner

**Belt Collins & Associates**

Perry J. White	Senior Planner
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**Aries Consultants Ltd.**

R. John Sanders	President
George W. Antis	Airport Planner

**Subconsultants**

Air Quality	Woodward-Clyde Consultants
Historic & Cultural	Cultural Surveys Hawaii
Fauna	Mr. Phillip L. Bruner
Flora	Char & Associates
Noise	Y. Ebisu & Associates
Socio-Economic	Earthplan
Traffic	Pacific Planning & Engineering, Inc.
Water Quality	AECOS

**17.0 COMMENTS RECEIVED DURING THE  
EIS PREPARATION NOTICE AND DRAFT EIS PUBLIC HEARING**

Scoping meetings were held on October 4, 1990, at Kahului, Maui, Hawaii to afford the public the opportunity to comment on the Kahului Airport Master Plan Update Environmental Assessment and EIS Preparation Notice, and topics to be discussed in the EIS. After publication of the Draft EIS (DEIS) in September 1991, a public hearing was held on November 13, 1991 in Kahului, Maui, Hawaii to provide the public with an opportunity to comment on the DEIS.

**Preparation Notice**

Comments received at the scoping meetings conducted for the Preparation Notice are listed below according to the following six categories:

<u>Type of Comments</u>	<u>Percent Of Comments</u>
Site Specific - includes direct impacts to defined areas or locations, including noise and biological impacts.	20
Airport Operations - refers to airport operations, functions, physical requirements, safety, or flight patterns.	18
Growth	
Growth in General - includes forecast-related issues, and general concerns about more people on Maui.	17
Growth and Infrastructure - includes impacts related to infrastructure systems.	5
Growth and Social Implications - includes social integration and social institution concerns.	8
EIS - includes EIS scope, content, process and procedures issues.	14
Economic - includes financially-related impacts.	11
Other - all issues not classified in the above categories.	<u>7</u>
Total	100



Category	Comments
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Site Specific

1. Address threat of tsunami
2. Beach cutoff
3. Effect of loss on agricultural land (HCS)
4. Interference with fishing on/from beach
5. Don't want to see Kanaha Beach Park narrowed next to airport.  
Need to accommodate population growth and protect for possible erosion
6. Effect of fuel spills during transportation
7. Possible improvements of fuel storage and pipeline. What happens if they leak?
8. Desirability of providing alternative (makai) route to Kahului (road)
9. Need to know about possible condemnations
10. Should consider noise abatement measures as part of planning (including curfews)
11. Concern over use of appropriate noise measures
12. Consider using coastal strip of airport and nearby areas for open space
13. Kanaha Beach Park as center for wind-surfing might be affected
14. Balance impacts on Spreckelsville with number who were there when airport was built
15. Extent of displacement of Spreckelsville residents
16. What effect will there be on businesses on Dairy Road
17. Look at Kealia Pond in conjunction with Kanaha Pond
18. Airport runoff/erosion/sediment. Effect on tako and fishing grounds
19. Noise impacts (health and welfare) on recreators and residents
20. Effect on wildlife sanctuary (fuel, noise, etc.)
21. Operational measures to address noise
22. Examine effect of fuel discharges on ocean (off Maalaea)
23. Impact of runoff on water quality and reefs
24. Discuss impact of overflights on Maalaea (noise)
25. Noise conflicts with surrounding land use; existing and potential
26. Effects on Kanaha Pond and endangered species
27. Dumping of fuel, effects on water quality and aquatic life
28. The EIS should address all effects of needed fuel facilities. Kahului Harbor. Soil, plant uptake, water pollution
29. Performance effects of airports (e.g., mental functioning)
30. Air quality effects from airplane and cars

Category

Comments

Airport Operations

1. Issues associated with 24-hour airport
2. Impacts on Hana Airport: tour vans, helicopters, etc.
3. Effects of increased interisland flights if more direct flights aren't possible
4. Will the airport attract late night fueling stops?
5. Analysis of past accidents and implications for future
6. Accident record vs. comparable airports
7. Mill stack penetration of approach slope (can't lower stack)
8. Different flight patterns associated with each alternative
9. Is so much space needed for transient aircraft?  
Does it need to be by the park; and will it be used for dangerous activities (Area K)?
10. Why not move airport to a new site?
11. Concern of risk associated with existing "short" runway.  
Think about aircraft safety
12. Location of helicopter between runways is dangerous; also can't see from Tower
13. Want to be sure runway is long enough
14. Want use of Puunene to be considered for GA and helicopters. Doesn't agree with FAA Tower concerns.
15. One long runway won't provide enough capacity.  
Need backup runway
16. Discuss what it will take to maintain what we have now (7,000 foot runway)
17. Study safety issues associated with 7,000 foot runway
18. What are the implications of providing more helicopter facilities any place on Maui; where should they be?  
Safety issues
19. Impact of changing flight patterns (upcountry)
20. Safety implications of keeping current runway length
21. What is needed for safety?
22. Look at extent to which longer runway decreases loss of life in accident
23. Will master plan try to control types of aircraft?
24. Do forecast consider new aircraft types (supersonic)?
25. How long will airport disruption continue? Concern about taking too long
26. Why not divert aircraft to Hilo, where the facilities are in place

**Category**

**Comments**

**Growth In General**

1. Need to see exact relationship of projects to surrounding development
2. Discuss impacts of incremental expansion. Airport is a constraint on arrivals, so improving it would allow growth
3. It is too passive to take forecasts as a given. Should consider using the airport as a "valve," because land use controls aren't as effective
4. Consider extent to which land uses is the controlling factor in growth impacts
5. Include statistics on airport expansion elsewhere to support growth analysis. Review all airport expansion in past 5-10 years across country, and show relationship of airport to growth
6. What effect will internationalization have on visitors traffic, on drugs?
7. Question accuracy of DBED forecasts
8. Do forecasts consider implications of direct flights from Europe?
9. Effect of direct flights from Europe
10. Evaluate effect that runway lengthening would have on passenger traffic
11. Need to focus on the forecasts. Don't rely on the "wish list" forecasts. Question belief that airport doesn't generate growth. EIS must admit that expansion will increase passengers, aircraft
12. Extent to which improvements will lead to increased visitor traffic - "enhance growth"
13. Discuss relationship between forecasts and State growth management policies
14. Should discuss/consider relationship to theme of "Balanced Growth" and all Functional Plans
15. Population impact analysis needs to consider secondary impacts, e.g., exotic species, helicopter tours
16. Need to address population impacts in view of what's allowed in CDP's
17. Show how airport relates to all Maui Island/Maui County
18. Impacts of internationalization on agriculture, police, and immigration
19. Impact on Haleakala in general, and Kipahulu in particular. Number of visitors
20. Concern that airport will facilitate growth that will ruin Maui
21. What possible effect on flora and fauna from international flights (exotic species introduction)?
22. Examine impact on flora and fauna of entire island and surrounding ocean
23. Introduction of biological pests that destroy native vegetation, e.g., coconuts
24. Determine what is safe to operate at the airport and don't allow others. If there are surplus (hotel/condo) rooms, use them for housing
25. Introduction of new plants/animals to Maui. Effect on environment and economy

Category	Comments
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**Growth And Infrastructure**

1. Solid waste from increased traffic
2. Need to provide facilities in a timely fashion
3. Discuss extent to which facilities are needed to accommodate growth
4. Need to coordinate airport development with capacity of other Maui infrastructure. Include analysis of funding of other infrastructure. All types: including social services and emergency medical
5. Provide discussion of way airport would affect other infrastructure improvements
6. Need to address impacts on infrastructure away from airport
7. Islandwide infrastructure

**Growth and Social Implications**

1. Socio-cultural impacts of tourism associated with airport expansion (Baseline study to supply data lacking)
2. Effect on spirit of Aloha
3. Examine the demographic impacts of the airport. Especially issues related to aging population
4. EIS should address secondary impacts of dealing with more foreigners
5. Are medical facilities adequate if it is internationalized?
6. Consult DOE, DOH, Social Services and Judiciary to examine potential impacts
7. Access (native Hawaiian) to shoreline; protect subsistence and cultural uses
8. Effect of internationalization on drug use (by children especially)
9. Accident analysis and ability to deal with all types of medical treatment, especially for accidents. Vascular surgeon. Trauma. Can the system handle the projected number of accidents
10. Study effect of "transported" culture on the existing society. (Hierarchical society)
11. Socio-economic growth model to evaluate effects of permitted growth, e.g. police, parks, health care, harbors
12. Adequacy of medical facilities, especially in an emergency. Maui Memorial Hospital. Quantitative analysis. Infectious diseases. Labs.

Category

Comments

EIS

1. Want assumptions revealed and put in the EIS
2. 11-200-16 (EIS Rules) - EIS should include responsible opposing views; thorough discussion in text
3. 11-200-17 - Discuss all alternatives and consider needs of everyone
4. Discuss "No Action" alternative in depth
5. Discuss all relevant policies; not just supportive
6. EIS should discuss what mitigation measures will be implemented
7. EIS should say how much existing facilities can accommodate
8. Analyze why it is necessary to have an international airport on Maui. Why is there a proposal to internationalize Kahului?
9. Effect of "No Action" on HIA
10. Make sure that cumulative impacts are addressed
11. Address "internationalization" impacts separately
12. Is it possible to separate projects to speed up processing?
13. Why is the project needed - not just for hotels. How will it improve the quality of life?
14. Compare differences between internationalization and increased "nationalization"
15. EISPN should not be used to constrain scope of EIS. It is too narrow. Amend if have to
16. EIS needs to evaluate specific alternatives. Alternative runway lengths (8,000, 9,000, 10,000, etc.). Especially relative to destinations
17. Clarify DOT's position on internationalization
18. EIS should say what DOT has been doing to encourage growth - cooperation with visitor industry. If DOT is advocating expansion, why act like the decision isn't made
19. Are the authors of EIS qualified in the field of social/human behavior? EIS should address these issues
20. Should discuss 261-13.5, HRS the power of the state to control number of aircraft operations

Category	Comments
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**Economic**

1. Short-term/long-term - address costs as well as benefits. Same for effects on range of beneficial uses
2. Implications of energy cost increase on traffic and economic justification of project
3. Consider need to broaden available tourism market - improve access
4. What is the source of income? How does Duty Free money fit?
5. Implications of different landing fees
6. Insurance cost/availability implications of no action
7. Impact of direct flights on cost/availability of interisland flights and residents access to other islands
8. How much money would come from a Duty Free shop on Maui? Would this be used on Maui for non-tourist facilities
9. Economic impact analysis showing what happens to the economy if changes are/are not implemented at the airport
10. Examine effects of airport on Maui economy. Show how far-ranging effects are
11. Discuss effect that alternatives will have on ability to diversify the economy
12. Impact of different types of visitors
13. Negative economic impact of not extending runway
14. Should consider the economic impacts of non-expansion
15. What is the current impact of Duty Free on planning for Kahului Airport? Who benefits?
16. What would be effect on specific classes of passengers? Residents vs visitors and different types of passengers
17. Increased dependency on tourism. Vulnerability

**Other**

1. Confirm that airport is part of infrastructure
2. Discuss pros and cons of direct flights vs interisland carrier link (Hawaiian/Aloha?)
3. What is the decision-making process?
4. What would trash the project?
5. Need to inform public that they can still influence plans
6. Better meeting timing; more information in public announcements
7. Will DOT guarantee respect for County decisions?
8. Will decision makers consider Chapter 342 (F), HRS?
9. Should have the meetings when there aren't major conflicts
10. Who makes route award decisions?
11. Will longer runway lead to loss of local control (from County Council to FAA)?

### **Public Hearing on DEIS**

Substantive comments received at the public hearing held for the DEIS, which were not included in the written responses received during the DEIS comment period and included in Appendix A, are listed below:

1. Maps showing features of proposed improvements are difficult to read
2. None of the maps in the DEIS show contour lines
3. Proposed parallel runway would further diminish use of coastline area for recreation
4. How issuance of airport revenue bonds will affect residence of the State and visitors
5. DOT's budgetary and funding process appears to have had inadequate input by the public
6. Ability to obtain manpower and funding for agricultural inspectors
7. DOT's intention of facilitating international tours to Kahului
8. Issue of tax revenues Maui visitor industry contributes to the State and County
9. Costs of various projects proposed are omitted
10. Assumption of DEIS that the community would need to meet visitor industry demands
11. Construction of public facilities may induce secondary affects