U.S. Department of Transportation
Federal Highway Administration

RECORD OF DECISION

HONOAPIILANI HIGHWAY
(ROUTE 30)
LAUNIUPOKO TO HONOKOWAI

LAHAINA BYPASS

Lahaina District, Maui County, State of Hawaii

I. Background

The Final Environmental Impact Statement (FEIS) for the Lahaina Bypass (accepted by the Governor of the State of Hawaii in February, 1991) was prepared on behalf of the State of Hawaii, Department of Transportation (HDOT) and the Federal Highway Administration (FHWA). As noted in the FEIS, the HDOT proposed the development of a Bypass Highway from Puamana to Kaanapali, as well as the widening of Honoapiilani Highway from Kaanapali to Honokowai (Base Project). A copy of the 1991 Record of Decision for the Base Project is incorporated as a part of this Record of Decision and is attached hereto for reference purposes. See Exhibit A.

Since the acceptance of the FEIS in 1991, the HDOT reevaluated the Base Project and modified the scope of the project to include the extension of the Bypass alignment from Kahoma Stream to Honokowai (5.1 miles), the construction of connector and access roads, and modifications to roadway profiles and typical sections.

In reexamining the functional benefits of extending the Bypass alignment to Honokowai, the HDOT determined that the extension of the alignment would have beneficial effects on regional transportation by accommodating the existing and long-term needs of the

West Maui region. As a result, the road widening improvements to Honoapiilani Highway, as described in the 1991 FEIS, were deleted and have been constructed as a separate, independent project.

With the changes to the scope of the Base Project, the HDOT and FHWA initiated the preparation of a Draft Supplemental Environmental Impact Statement (DSEIS). The DSEIS focused on the modifications to the Base Project as noted above. The notice of availability of the DSEIS was published on March 8, 1996, followed by a public hearing on April 25, 1996.

Since the filing of the DSEIS, further project modifications were incorporated to address comments received during the DSEIS review process. Specifically, the HDOT (with the concurrence of the FHWA) determined that extending the southern alignment of the Bypass from Puamana to Launiupoko (1.3 miles) is beneficial with regard to coastal zone management considerations (i.e., shoreline processes). In addition, the HDOT reexamined the benefits of including in the first construction phase truck-climbing lanes along certain uphill grades of the Bypass alignment. The HDOT also added the designation of the highway as a bike route, with revisions to the roadway cross-section to accommodate this use. (See FSEIS, Page 1 to Page 10 and Page 34 to Page 39 for more information.)

II. Decision

The selected alternative for the construction of Honoapiilani Highway from Launiupoko to Honokowai (Lahaina Bypass), described in the Final Supplemental Environmental Impact Statement (FSEIS), is referred to as the Modified Project.

The Modified Project improvements reflects the modifications to the Base Project, as well as the additional changes which have been incorporated since the preparation

and circulation of the DSEIS.

The Modified Project will involve the construction of a four (4) lane, controlled access, Bypass Highway between Launiupoko and Honokowai, a distance of approximately 9.0 miles. Additional improvements include connector and access roads, as well as modifications to roadway profiles and typical sections.

The Bypass Highway will originate at Launiupoko, south of the town of Lahaina, and proceed in a northerly direction to Ikena Avenue in Lahaina. From this point, the Bypass will proceed in a northwesterly direction until it reaches Kapunakea Street in Lahaina. The Bypass will then continue in a northerly direction as it passes to the east of the Kaanapali Resort and then proceed in a northwesterly direction until it reaches its terminus near the community of Honokowai, south of Mahinahina Gulch. The minimum right-of-way along the entire length of the modified Bypass alignment will remain unchanged at 150 feet.

The Bypass Highway will be developed in two (2) phases, with two (2) travel lanes to be constructed during each phase. The original Bypass alignment between Kauaula Stream to Kapunakea Street (2.0 miles) will remain unchanged; however, proposed modifications within this segment will involve changes to roadway profiles and typical sections. The two (2) travel lanes and separate truck-climbing lane between Puamana and Lahainaluna Road proposed by the Base Project have been eliminated. Instead, three (3) separate truck-climbing lane segments will be provided along the Bypass alignment during the project's first phase, one (1) southbound segment and two (2) northbound segments. The southbound truck-climbing lane segment will be approximately 9,700 feet in length and will extend from the southbound approach of the Honokowai Stream bridge crossing to a location about 1,800 feet north of Wahikuli Gulch. The first of the two (2) northbound truck-climbing lane segments will be approximately 2,000 feet in length and will start from a point about 1,500 feet north of

the Wainee Reservoir and stretch to a point approximately 1,200 feet south of Lahainaluna Road. The second northbound segment will be about 2,700 feet in length and begin from a point approximately 2,800 feet north of the Wahikuli water tank and reach to the northbound approach of the Hahakea Gulch bridge crossing. Upon completion of the project's second phase, the truck-climbing lanes will be eliminated and the roadway sections will revert to their typical configuration. In addition, the roadway profile along Ikena Avenue will be modified to reflect a depressed or cut condition to allow for a grade-separated crossing at Lahainaluna Road instead of the at-grade crossing which was originally proposed.

Further changes include extending the Bypass from Kahoma Stream to Honokowai (5.1 miles) and from Puamana to Launiupoko (1.3 miles). The extension of the Bypass to Honokowai and Launiupoko were considered as alternatives in the Base Project's FEIS and the Modified Project's DSEIS, respectively. The extension to Honokowai will follow an alignment about 4,000 to 5,000 feet east of Honoapiilani Highway and return to the highway just south of Mahinahina Gulch, while the extension to Launiupoko will follow an alignment about 1,500 feet east of Honoapiilani Highway before returning to the highway just north of Launiupoko Point.

Additional modifications include the addition of the Kaanapali Connector and the Lahainaluna Road-Bypass Access, as well as roadway alignment modifications through lands underlying the State Housing and Community Development Corporation of Hawaii's (HCDCH) Villages at Leiali'i housing development. The Kaanapali Connector will serve as an east-west link between Honoapiilani Highway and the Bypass and facilitate access to the Kaanapali Resort and adjoining residential areas. The Lahainaluna Road-Bypass Access will serve to facilitate access to public schools and residential areas along Lahainaluna Road, as well as the town of Lahaina.

The Kaanapali Connector will be located to the north of the Lahaina Civic Center and

will be approximately 1.0 mile in length. Initial construction will provide for two (2) travel lanes within an 80-foot ultimate right-of-way. Ultimately, the Kaanapali Connector will include two (2) travel lanes in each direction.

The Lahainaluna Road-Bypass Access will extend a distance of about 0.3 mile and will consist of two (2) travel lanes within a 60-foot right-of-way.

Access from the Bypass to the town of Lahaina and the Kaanapali Resort will be provided by the Kaanapali Connector and the Lahainaluna Road-Bypass Access. The intersections formed by the Kaanapali Connector with Honoapiilani Highway and the Bypass will be signalized as traffic warrants, while the Lahainaluna Road-Bypass Access will be unsignalized at the Lahainaluna Road and Bypass intersections.

In addition, access points for Honoapiilani Highway would be provided near the north and south ends of the project, as well as provisions for two (2) grade-separated crossings for agricultural roads which would traverse the Bypass. The entire Bypass alignment will also be designated as a bike route; the roadway's shoulders have been dimensioned to accommodate bicyclists.

The proposed improvements are anticipated to improve highway capacity and alleviate traffic congestion between Launiupoko and Honokowai. In addition, the proposed Bypass will provide an alternate transportation route between Launiupoko and Honokowai in the event sections of the existing Honoapiilani Highway are closed due to traffic accidents, fire and smoke hazards, or high surf crossing the roadway.

See FSEIS, Page 11 to Page 43 and Exhibit A for more information.

III. Alternatives Considered

As reflected in the FEIS for the Base Project, several alternatives were examined to address the long-range highway needs for the West Maui region. The extension of the Bypass to Honokowai (following an alignment similar to that of the Modified Project) was considered as one possible alternative but was given a lower priority at that time due to the higher costs of extending the roadway.

Since the acceptance of the FEIS, the HDOT reviewed additional technical data contained in the Maui Long-Range Highway Planning Study (1991), and determined that the extension of the Bypass to Honokowai would have long-term benefits by providing an alternate travel route which would address future transportation needs in the region, as well as relieve traffic on the existing Honoapiilani Highway. The Maui Long-Range Highway Planning Study revealed traffic volumes in excess of the volumes which were originally forecasted by the HDOT in 1987. The higher projected volumes were attributable to additional development projects such as the Villages at Leiali`i, a 4,000-unit master-planned community proposed by the HCDCH. Given the higher traffic projections for the year 2010, the Maui Long-Range Highway Planning Study envisioned the Bypass to ultimately function as a four-lane divided highway. It should be noted that widening the existing Honoapiilani Highway beyond four-lanes from Kaanapali to Honokowai is constrained by right-of-way limitations.

A southern extension of the Bypass to Launiupoko was previously considered during the conceptual planning stages for the Modified Project. This extension was included as an alternative in the DSEIS but was discounted at the time due to cost considerations. Since the filing of the DSEIS, however, the HDOT reconsidered extending the Bypass to Launiupoko since the potential for shoreline erosion poses a threat to Honoapiilani Highway in this vicinity. It should be noted that the HDOT plans to mitigate the existing shoreline erosion conditions with the proposed Honoapiilani

Highway Revetment Protection Project at Launiupoko.

The selection of the Modified Project, which represents the preferred alternative, is based upon discussions and input from Federal, State, and County agencies, as well as through input obtained via the public involvement process. Although the existing Honoapiilani Highway was recently widened from two (2) to four (4) lanes between Kaanapali Parkway to Honokowai, highway capacity and the level-of-service at controlling intersections along the existing highway will be exceeded with the future growth of the West Maui region. In the town of Lahaina, where there are numerous intersections, approximately 50 percent of traffic movements at key intersections involve turning movements. By providing an alternate transportation route to the existing Honoapiilani Highway, the Modified Project would facilitate travel between Launiupoko and Honokowai by increasing highway capacity and alleviating traffic congestion, as well as by providing an alternate travel route in the event traffic accidents, fire and smoke hazards, or high surf crossing the highway result in road closures. It should also be noted that the Modified Project will not have an adverse effect on Section 4(f) properties.

The environmentally preferred alternative is the No-Build Alternative. However, this alternative was not selected since it does not address the project purpose and need of improving highway capacity and alleviating traffic congestion between Launiupoko and Honokowai. Under the No-Build Alternative, traffic congestion along the existing Honoapiilani Highway would worsen and an alternate transportation route between Launiupoko and Honokowai for domestic, commercial, and emergency vehicles would not be provided. In addition, the existing highway would continue to be subject to closures due to traffic accidents, fire and smoke hazards, or high surf crossing the highway. Furthermore, adequate access to approved development projects, of which the Bypass has been incorporated as a major transportation element, would not be available.

See FSEIS, Page 158 to Page 164 and Exhibit A for more information.

IV. Section 4(f)

Coordination with the County of Maui, Department of Parks and Recreation (DPR) was undertaken to assess the effect the Modified Project's profile modification would have on Kelawea Mauka Park. The DPR provided the HDOT with comments and recommendations concerning potential impacts to the park relating to parking and safety requirements, pedestrian and park maintenance access, and water service. The HDOT subsequently expressed its commitment toward implementing the DPR's recommendations to mitigate proximity impacts to Kelawea Mauka Park.

The findings and recommendations of the archaeological inventory and pedestrian surveys that were prepared for the Modified Project were accepted by the State Historic Preservation Division (SHPD). An "Archaeological Treatment Plan for No Adverse Effect" for the four (4) sites (Sites 2485, 2491, 2487, and Puukolii Cemetery) in the general area of the Modified Project, but outside the area of potential effect, as well as the four (4) sites within or adjacent to the area of potential effect (Sites 2484, 2489, 2490, and 2487), was also prepared and accepted by the SHPD. This treatment plan recommended data recovery for Site 2484 and preservation through avoidance for Sites 2485, 2487, 2489, 2490, 2491, 2847, and Puukolii Cemetery. In addition, the treatment plan included a formal monitoring plan for Site 2487. In light of the fact that mitigation plans for the Modified Project have been approved by the SHPD, thus ensuring "no adverse effect" to significant historic sites within or immediately adjacent to the project corridor, the SHPD indicated that a Memorandum of Agreement will not be needed.

In light of the foregoing, the provisions of Section 4(f) are not considered applicable.

See FSEIS, Page 112 to Page 119 and Exhibit A for more information.

V. *Measures to Minimize Harm*

Appropriate mitigative measures and Best Management Practices will be utilized in the construction of the Modified Project to ensure that dust, noise, drainage, soil erosion, emission control, sediment control, and water quality parameters are not compromised. To minimize construction impacts, mitigative measures include, but are not limited to, temporary and permanent slope stabilization, the early construction of drainage control features, minimizing the area and time of exposure of open areas during construction, and the use of sedimentation basins, filter fabric barriers, retention basins, erosion control fabric, hydromulching, and barriers between streams and work areas. In addition, construction will be undertaken during dry periods and excess materials will be removed from construction areas.

To ensure conformance with these standards, construction plans, specifications, and related documents (drainage reports, soil and erosion control plans, Best Management Practices) will be prepared during project's final design phase and submitted to the appropriate governmental agencies for review and approval. The HDOT will comply with all applicable governmental permit requirements for the development of the Modified Project (e.g., Department of the Army, Section 401 Water Quality Certification, Stream Channel Alteration Permit, National Pollutant Discharge Elimination System, Community Noise Permit, Special Management Area Use Permit, Grubbing and Grading Permits).

From a long-term perspective, the proposed project will result in improved traffic flow and circulation through and within the West Maui region. Impacts associated with traffic flow along the Bypass would include noise generation and air quality emissions. Inasmuch as the proposed Modified Project to Honokowai traverses undeveloped agricultural lands, appropriate mitigation measures addressing noise impacts will be

implemented for proposed future developments located in the vicinity of the Bypass. Insofar as long-term noise mitigative measures for Ikena Avenue are concerned, a combination of 6- and 8-foot sound attenuating walls along the avenue will be required to meet the HDOT's 15dB "substantial increase"noise abatement standard. In addition, a 6-foot high wall section will be needed along the southern segment of the Ikena Avenue right-of-way (west-facing portion) to reduce traffic noise levels below the FHA/HUD standard of 65 Ldn. Closure and air conditioning are recommended for the second floors of the seven (7) two-story homes along the Modified Project alignment through Ikena Avenue. Air quality along the Bypass will be affected by vehicular emissions. However, the projected levels of emissions are anticipated to be within State and Federal air quality standards.

The proposed extension of the Bypass to Honokowai and Launiupoko, and the provision of the Kaanapali Connector and Lahainaluna Road-Bypass Access, will require the removal of an additional 65 acres of agricultural lands, formerly planted with sugar cane (as compared to the Base Project). The removal of these additional agricultural lands, however, is not anticipated to affect the inventory of lands available for agricultural use.

See FSEIS, Page 87 to Page 145 and Exhibit A for more information.

VI. Monitoring or Enforcement Program

Special monitoring or enforcement programs have not been adopted for specific project mitigation measures. Current Federal Highway Administration (FHWA) and HDOT policies and procedures will be utilized to ensure that all of the mitigation measures referenced and/or prescribed above are implemented, including those measures set forth in Exhibit C-3 of this Record of Decision.

VII. Comments on the FSEIS

The FSEIS was circulated to governmental agencies, organizations, individuals, and the public on June 24, 2002 and its availability was published in the Federal Register on July 12, 2002 and the June 23, 2002 edition of the State of Hawaii, Office of Environmental Quality Control's Environmental Notice. The Federal Register FSEIS availability period ended on August 12, 2002.

The following comments were received during the review of the FSEIS. Responses to the comments also follow. In addition, a public information meeting was held at the Lahaina Civic Center on August 27, 2003 to disseminate information included in the Record of Decision, including information responding to comments on the FSEIS.

A. August 13, 2002 - U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). See Exhibit B.

Comments: As discussed with Maui NRCS conservationist Neal Fujiwara, the source of the agency's comments, the intent of their comments is to indicate that coordination with the Bishop Estate and other landowners is important to ensure that the construction of the Lahaina Bypass will not have an adverse effect on their agricultural crops and infrastructure. The NRCS also noted that there are about three to four smaller gulches between Kauaula Stream and Lahainaluna Road that will require culvert crossings and that there is a potential interaction between the Lahaina Flood Control Project and the Dickenson Street and Puamana Connectors.

Response: During the project's design phase, the FHWA/HDOT will consult with the Bishop Estate and other landowners to discuss their agricultural operations and identify crops and infrastructure locations. During implementation, the FHWA/HDOT will coordinate construction activities with the Bishop Estate and other landowners to avoid or minimize disruptions to their operations. The location of drainageway crossings will be specifically identified during the project's design phase and appropriately designed crossings will be constructed. The

County of Maui has indefinitely postponed its plans for constructing the Dickenson Street Connector in favor of extending Keawe Street to connect to the first segment of the Bypass (Lahainaluna Road to Keawe Street). Opportunities for interaction and coordination between the Lahaina Watershed Project (aka, Lahaina Flood Control Project), and the Dickenson Street and Puamana Connectors are provided through the project planning, design and construction processes. The environmental review and regulatory approval processes provide additional opportunities for interaction and coordination and also serves as a platform for identifying and evaluating potential impacts and formulating appropriate mitigative measures.

B. August 19, 2002 - U.S. Environmental Protection Agency (EPA). See Exhibit C

Comments: The EPA indicated that there was insufficient information in the FSEIS about the traffic impacts of new development adjacent to the Bypass, as well as on cumulative and secondary impacts, water quality impacts and specific mitigative measures, and the volumes of cut/fill associated with the project.

Response: An updated traffic analysis has been prepared for assessing the traffic impacts of new development and is attached hereto as Exhibit C-1. An analysis of cumulative and secondary impacts for the Bypass and connector roads has been prepared and is attached hereto as Exhibit C-2. Non-point source pollution impacts to water quality (from the operation of the Bypass) and specific mitigation measures have been identified and are attached hereto as Exhibit C-3. Areas of high erosion potential due to construction and cut/fill operations, as well as specific mitigative measures have been identified and are also included in Exhibit C-3. Mitigative measures, such as those identified in Exhibit C-3, will be implemented by the FHWA/HDOT to minimize non-point source pollution impacts and erosion during construction.

VIII. Conclusion

Based upon a careful consideration of all the social, economic, and environmental analyses contained in the FSEIS and the input from governmental agencies,

organizations, individuals, and the public, it is the decision of the FHWA to select the Modified Project alignment for the construction of Honoapiilani Highway (FAP Route 30) from Launiupoko to Honokowai in the Lahaina District on the island of Maui, State of Hawaii.

IX. Approval Recommendation

The FHWA Western Resource Center has reviewed this Record of Decision. The 30-day FSEIS availability period was published in the July 12, 2002 edition of the Federal Register (Volume 67, Number 134) and expired on August 12, 2002. Approval of this Record of Decision is recommended.

Record of Decision Approval

10/14/03
Date

Abraham Wong, Division Administrator
Federal Highway Administration
Hawaii Division

LIST OF EXHIBITS

Exhibit "A"	Record of Decision Honoapiilani Highway (Puamana to Honokowai) June 18, 1991
Exhibit "B"	Natural Resources Conservation Service Letter (August 13, 2003)
Exhibit "C"	U. S. Environmental Protection Agency Letter (August 19, 2003)
Exhibit "C-1"	Traffic Analysis
Exhibit "C-2"	Cumulative Impacts Analysis

- Attachment 1 to Exhibit "C-2" - Housing and Community Development Corporation of Hawaii Letter (February 28, 2003)

Exhibit "C-3"	Best Management Practices

EXHIBIT "A"

Record of Decision
Honoapiilani Highway
(Puamana to Honokowai)
June 18, 1991

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

RECORD OF DECISION

HONOAPIILANI HIGHWAY, LAHAINA BYPASS
Puamana to Honokowai
Lahaina District, County of Maui, Hawaii

Federal-Aid Primary Route 30
Project Numbers 30AB-01-85 & 30AB-01-87

DECISION

The selected alternative for the construction of the Honoapiilani Highway from Puamana to Honokowai is Alternative B, Mauka Tier Variation, for the Puamana to Kaanapali section and the Widening Alternative for the Kaanapali to Honokowai section. The final environmental impact statement (final EIS) for the subject project (FHWA-HI-EIS-88-02-F) identified this alternative as the preferred alternative. The selected alternative consists of the following major project features:

Puamana to Kaanapali Section: Alternative B, Mauka Tier Variation

A realigned approximate 2.5-mile long, two-lane highway on a 150-foot minimum right-of-way from Puamana to Lahainaluna Road, and a realigned approximate three-mile long, four-lane highway on a 150-foot minimum right-of-way from Lahainaluna Road through the mauka (inland or towards the mountain) tier of residential parcels on Ikena Avenue, crossing Kahoma Stream and continuing onto the Kaanapali Parkway at Kaanapali.

Kaanapali to Honokowai Section: Widening Alternative

Widening approximately three miles of the existing two-lane Honoapiilani Highway to a four-lane, divided highway.

EXHIBIT "A"

State highway serving West Maui, which consists of commercial, agricultural, resort, and residential land uses. The rapid growth of the resort areas, together with increased commercial and residential development and activities in West Maui, is causing substantial traffic increases on Honoapiilani Highway.

The volume of traffic on Honoapiilani Highway is heaviest between Front Street/Fleming Road and the Kaanapali Parkway where average daily traffic (ADT) is projected to increase from the current ADT of approximately 34,800 vehicles to about 70,400 ADT in the year 2007. The need for the proposed project is due to these projected increases in traffic volumes.

Although an additional northbound lane was recently added to the existing highway between Lahainaluna Road and Kaanapali Parkway to provide two lanes in each direction, this short-term improvement will only temporarily improve the situation since the capacity of the controlling intersections will be exceeded in the near future. The existing Honoapiilani Highway in Lahaina has numerous intersections, and at some of the key intersections, approximately one half of the movements through the intersection are turning movements.

The "Do-Nothing" Alternative would not solve the congestion and operational problems that currently exist and that without improvement will continue to worsen in the future. Future traffic is projected to double by the year 2007 with the existing level of service (LOS) of B to E changing to level F and the "some congestion" at specific problem areas changing to "extreme congestions" causing gridlock in Lahaina to Kaanapali. For these reasons, the Do-Nothing Alternative is not being selected. See final EIS pages 5 to 15 for additional information regarding the purpose and need for the project.

Puamana to Kaanapali Corridor

Alternative A, the Pioneer Mill alternative, would impact mill operations requiring extensive modifications and relocation of the physical plant. Alternative A is not being selected because of high cost, adverse impacts to the Pioneer Mill operations, proximity to the existing highway creating poor spatial relationships, and impacts to the Lahaina Historic District.

The Tunnel and Retaining Wall Variations of Alternative B are not being selected because they have substandard geometrics, higher construction costs, and affect 36 residential parcels and Kelawea-Mauka Park. Also, the tunnel would have high maintenance costs.

Alternative C, through the Lahainaluna schools, would impact the expansion plans of Lahainaluna High School, Lahaina Intermediate School, and Princess Nahienaena Elementary School. Alternative C is not being selected because of the impacts to the Lahainaluna school facilities and operations and to nearby historic properties, and because the distant location and added length of the alignment would not serve the traffic in the Lahaina vicinity.

Alternative B, Mauka Tier Variation is being selected because of its lower cost, optimal spatial relationship with the existing highway, and impact avoidance to the Pioneer Mill, the Lahaina Historic District, and the Lahainaluna schools.

Kaanapali to Honokowai Corridor

The Widening Alternative was selected over the Extension Alternatives on new alignment as the Extension Alternatives are longer, require sugarcane lands, and have a higher overall cost.

For the reasons outlined above, the Puamana to Kaanapali Corridor Alternative B, Mauka Tier Variation and the Kaanapali to Honokowai Corridor Widening Alternative are considered the alternatives preferable from a strictly environmental point-of-view in the sense that they are the least disruptive alternative.

MEASURES TO MINIMIZE HARM

The following measures have been incorporated into the project to reduce the impact of constructing the selected Honoapiilani Highway Project between Puamana and Honokowai. Other measures to mitigate project impacts, including standard specifications and practices, are included in final EIS Section VII, "Anticipated Impacts and Mitigative Measures," (pages 79 to 96), and in the responses to the draft EIS comments that are contained in final EIS Section XIV, "Comments and Responses on the Draft EIS," (pages 151 to 230). These additional mitigating measures are incorporated into this record of decision by reference.

Residential and Business Displacement

At least 84 feet will need to be acquired from the residential lots mauka of Ikena Avenue to establish the necessary 150-foot wide right-of-way. This will require the displacement of approximately 20 households and the acquisition of 20 residential properties

along Ikena Avenue. In addition, approximately 99.3 acres of prime sugar cane land will be necessary for the right-of-way of the selected alternative.

The impacts of residential and business displacement and property acquisition will be mitigated by providing benefits, payments, and services in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act and its implementing regulations. See final EIS pages 81 to 84 and Appendices B and P for additional information regarding project relocation and property acquisition impacts and mitigation.

Highway Traffic Noise

The selected alternative proposes the installation of approximately 2370 linear feet of six-foot high noise barrier to reduce the projected highway traffic noise on adjacent sensitive receptors. The approximate locations of the noise barriers are depicted in Figure 29, final EIS page 93.

The project noise impacts and proposed noise barriers will be restudied during final project design. The final noise barrier lengths, heights, locations, and materials will be determined through additional noise assessment, mitigation cost-effectiveness, and aesthetic evaluations and the involvement of the affected public. See final EIS pages 88 to 95 for additional information regarding project noise impacts and mitigation.

MONITORING OR ENFORCEMENT PROGRAM

Special monitoring or enforcement programs have not been adopted for specific project mitigation measures. Current Federal Highway Administration and Hawaii Department of Transportation policies and procedures are adequate to ensure that all of the mitigation measures referenced and/or prescribed above are carried out.

COMMENTS ON FINAL EIS

The final EIS was circulated to other government agencies, organizations, and the public on February 28, 1991, and its availability was published in the March 15, 1991 Honolulu Star-Bulletin and the March 29, 1991 Environmental Protection Agency Federal Register Notice of Availability. The final EIS 30-day availability period ended on April 29, 1991. As of the approval

date of this record of decision, the Federal Highway Administration has not received any comments on the final EIS from other agencies, organizations, or the public.

CONCLUSION

Based upon a careful consideration of all the social, economic, and environmental evaluations contained in the final environmental impact statement; the input received from other agencies, organizations, and the public; and the factors and project commitments outlined above, it is the decision of the Federal Highway Administration to select Alternative B, Mauka Tier Variation (Puamana to Kaanapali) and the Widening Alternative (Kaanapali to Honokowai) for the construction of the Honoapiilani Highway between Puamana and Honokowai. This selected alternative was identified as the preferred alternative in the Federal Highway Administration and Hawaii Department of Transportation final environmental impact statement (FHWA-HI-EIS-88-02-F).

APPROVAL RECOMMENDATION

This record of decision has been reviewed by the FHWA Region Nine Office of Regional Counsel. The 30-day final EIS availability period was published in the March 29, 1991 Federal Register and expired on April 29, 1991. Approval of the record of decision is recommended on or after April 30, 1991.

6/18/91
Date

Assistant Regional Counsel
Federal Highway Administration
Region Nine

RECORD OF DECISION APPROVAL

June 18, 1991
Date

Director
Office of Program Development
Federal Highway Administration
Region Nine

EXHIBIT "B"

Natural Resources Conservation Service Letter (August 13, 2003)

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850
(808) 541-2600 Ext. 2
FAX (808) 541-1335

Our People...Our Islands...In Harmony

August 13, 2002

Mr. Brian Minaai, Director
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Minaii:

Subject: HWY-PA 2.6695 Final Supplemental Environmental Impact Statement (FEIS) for Honoapiilani Highway, Launiupoko to Honokowai, Island of Maui

We have reviewed the above document and have the following comments to offer:

There are approximately three to four smaller gulches between Kauaula Stream and the Lahainaluna Road Bypass Overpass that will require culvert crossings.

There are many areas where existing agricultural land will be separated by the road's construction. The following links to the land will need to be addressed:

1. Crop
2. Irrigation Pipeline
3. Irrigation Ditch
4. Diversions/Terraces and outlets
5. Windbreak
6. Field Roads

Also, there is a potential interaction between the Lahaina Watershed Project and the proposed Dickenson Street Connector Road and the proposed Paumana Connector Road.

Thank you for the opportunity to review this document.

Sincerely,

ACTING FOR
KENNETH M. KANESHIRO
State Conservationist

EXHIBIT "C"

U. S. Environmental Protection Agency
Letter
(August 19, 2002)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

August 19, 2002

Abraham Wong, Division Administrator
Federal Highway Administration – Hawaii Divisic
300 Ala Moana Boulevard, Room 3-306
Honolulu, HI 96850

Dear Mr. Wong:

The Environmental Protection Agency (EPA) has reviewed the Final Supplemental Environmental Impact Statement (FSEIS) for the **Honoapiilani Highway (FAP Route 30) Launiupoko to Honokowai, Lahaina District, Maui County, Hawaii** (CEQ Number: 020287, ERP Number: FHW-K40166-HI). Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. This letter provides a summary of EPA's concerns.

The Federal Highway Administration (FHWA) and the State of Hawaii Department of Transportation (HDOT) propose a four-lane, controlled access Bypass Highway between Launiupoko and Honokowai (9.0 miles), which will be constructed in two phases. The entire project envelope will be graded during phase one, but only two lanes, and three additional truck-climbing lanes, will be constructed at that time. During phase two, the truck climbing lanes will be eliminated when the ultimate four-lane project is constructed. The project also includes the construction of the Kaanapali Connector Road (ultimately, four lanes, 1.0 miles), the Lahainaluna Road-Bypass Access (two lanes, 0.3 miles), the lowering of the Bypass at Ikena Avenue to allow for grade-separation at Lahainaluna Road, two grade-separated Bypass undercrossings for agricultural equipment, and the "dead ending" of the Honoapiilani Highway at the north and south boundaries of the proposed bypass. Five additional connector roads are planned between the new Bypass Highway and Honoapiilani Highway: Puukolii, Wahikuli, Kapunakea, Lahaina Town/Dickenson, Puamana. These five additional connector roads are not analyzed in the FSEIS.

The Modified Project Alignment described in the FSEIS builds on, and modifies, the "Base Project," which was accepted in the 1990 Final EIS. The Modified Project Alignment is significantly different from, and more complex than, the Base Project. EPA reviewed the Draft Supplemental EIS (DSEIS) in 1996 and rated the document EC-2, *Environmental Concerns – Insufficient Information*. Among our concerns were the absence of data on: the traffic impacts of new development adjacent to the proposed project, cumulative impacts, water quality impacts and specific mitigation measures, and the volumes of cut and fill associated with the proposed project. Upon review of the FSEIS, we have found that the issues we raised in our review of the

DSEIS are not thoroughly addressed in the FSEIS. Specific responses to EPA's recommendations are deferred to future design documents and/or permits. The information requested by EPA should have been included in the FSEIS as this information contributes to the public and decision makers' ability to make an informed decision on the pending project. Deferring the disclosure of this relevant information to a later date does not promote an open and informed decision-making process.

EPA has continuing concerns about the sufficiency of the NEPA document and the impacts to the environment from the proposed project. We have had the opportunity to discuss these issues with Domingo Galicinao of your staff. A discussion of our concerns and our recommendations for the Record of Decision (ROD) are listed below.

Traffic Impacts

The proposed new Bypass will traverse the planned Villages at Leiali'i (4,000 new residential units) and Puukolii Village (1,700 new residential units), serving as a critical transportation element of these master planned residential communities. The Bypass will also traverse Project District Number 3, a planned 1,200-unit residential and commercial district (p.133). In our comments on the DSEIS, EPA recommended that the FSEIS contain an expanded traffic analysis that includes an accounting of the increase in vehicle trips to and from the planned development. In response to our comments, the FSEIS states that traffic studies for these projects were reviewed by HDOT and that a new analysis of any new potential impacts to traffic on the Bypass will be prepared prior to actual development. An expanded traffic analysis is not included in the FSEIS.

Because the Leiali'i and Puukolii Villages are heavily dependent on the Bypass as a "critical transportation element," information on the circulation interface of these two developments and the Bypass should have been included in the FSEIS. Pertinent information such as, 1) ingress and egress from the new development to the Bypass Highway, 2) the expected increase in traffic on the Bypass from the proposed development, 3) the traffic operation of key intersections along the Bypass adjacent to new development, and 4) proposed mitigation is important to understanding the full operational impact to the Bypass from the master planned developments. The absence of this available information in the FSEIS compromises the ability of the public and decision-makers to make informed decisions about the proposed project.

The traffic analysis presented in the FSEIS also appears to rely on outdated studies. The traffic analyses are based on 1991 studies that use a projection year of 2010 (p.3), and the project design year is not specified. Given that the construction start date for Phase I is expected in late 2004, the project design year is likely well beyond 2010. The FSEIS should have either described why the 1991 analysis, and the 2010 projections, are still valid, or the FSEIS should have included a revised and updated traffic analysis, specifying the project design year.

We note that five additional connector roads are planned between the new Bypass Highway and Honoapiilani Highway – Pumkolii, Wahikuli, Kapunakea, Lahaina Town/Dickenson, Puamana – and that these five additional connector roads are not analyzed in the FSEIS. The FSEIS states that Environmental Assessments (EA) will be prepared for the Lahaina Town/Dickenson, Wahikuli, and Kapunakea Connectors and that no EA will be required for the Puukolii Connector. The FSEIS does not specify whether an EA will be prepared for the Puamana Connector (p.19, Response to comments to the Hawaii Department of Budget and Finance). Because each of these roads would not be built "but for" the construction of the Bypass, each of these connector roads are "connected actions" to the Bypass (40 CFR 1508.25 (a)(1)(iii)). As such, these connector roads, like the Kaanapali Connector Road and the Lahainaluna Road-Bypass Access, should have been analyzed in the FSEIS (40 CFR 1508.25 (a)(1)).

Recommendation:

Because of the deficiencies in the traffic analysis noted above, EPA strongly recommends that FHWA and HDOT make a commitment in the Record of Decision (ROD) to 1) study the environmental impacts of the connector roads in a single NEPA document, as opposed to several individual EAs and 2) to include a detailed analysis of the traffic impacts of the master planned developments to both the Bypass and the connector roads in that single NEPA document.

Secondary and Cumulative Impacts

The FSEIS acknowledges that cumulative impacts to air and noise will result from urban development and increased traffic associated with the proposed project (p.141) and that the project may induce currently unplanned growth (p.143). However, this cumulative impacts analysis is insufficient because the analysis fails to: 1) describe the methodology used to identify cumulative impacts, 2) measure cumulative impacts to other sensitive resources such as water quality and habitat connectivity, and 3) measure the significance of these cumulative impacts. Additionally, the secondary impacts analysis does not describe specific impacts to the environment from induced growth. Because the secondary and cumulative impacts analyses are cursory, the proposed approach to mitigating these impacts is also cursory. The purpose of the secondary and cumulative impacts analyses is to alert the public and decision-makers to significant impacts to the environment as a whole as related to the proposed project and to identify opportunities for minimizing such impacts. This FSEIS fails to provide the public and decision-makers with this type of comprehensive analysis.

Recommendation:

EPA recommends that FHWA and HDOT make a commitment in the ROD to actively work with the communities of West Maui to identify specific secondary and cumulative impacts associated with the proposed project and to develop specific mitigation measures to minimize those impacts. FHWA and HDOT should commit to those mitigation measures, as appropriate.

EPA further recommends that FHWA and HDOT commit to including a rigorous cumulative impacts analysis in the NEPA document for the connector roads referenced above. For an example of a good format to use for cumulative impact assessments, see FHWA's Supplemental Draft EIS for the *Proposed Interstate 880/Route 92 Interchange Reconstruction Project, Alameda County, California* (June 2002). EPA is also available to provide guidance on the preparation of cumulative impact assessments.

Water Quality

EPA has continuing concerns regarding the level of analysis and proposed mitigation for non-point source water pollution. The FSEIS states that the proposed project will traverse seven drainageways that ultimately carry flows to the ocean (p.88) and that runoff generated east of the Bypass will be captured and conveyed by a proposed Natural Resource Conservation Service (NRCS) stormwater conveyance facility (p.96). While the FSEIS references EPA's *Guidance for Specifying Measures for Sources of Nonpoint Pollution Control in Coastal Waters*, the FSEIS does not include a specific discussion of non-point source pollution generated by operation of the proposed facility nor does the FSEIS include the types of Best Management Practices that may be implemented to minimize non-point source pollution from stormwater runoff during operation of the facility. Additionally, the FSEIS does not provide specifics on the NRCS stormwater conveyance system and how the system may be modified to handle additional runoff loads and stormwater pollution generated by the Bypass.

Recommendation:

EPA recommends that FHWA and HDOT identify non-point source pollution impacts from the operation of the proposed project and commit to specific mitigation measures in the ROD.

Cut and Fill

In our comments on the DSEIS, EPA recommended that the FSEIS provide information as to the amount of material that will be moved as part of the construction and cut and fill operation. In addition, EPA recommended that the FSEIS identify areas with the potential for significant erosion impacts due to hydrology, geology, or topography. In response to our comments, the FSEIS states that both of these issues will be addressed in the future during preparation of the construction plans.

Addressing these issues in the future is insufficient. Through the course of analyzing the proposed project, this information should have been readily available. The volume of cut and fill is standard information that is regularly included in NEPA documents on transportation projects. The identification of areas with high erosion potential, and appropriate, specific mitigation measures, should have also been readily identifiable based on existing environmental information. For an example of a NEPA document where these issues were adequately addressed, see *Boulder City/U.S. 93 Corridor Study DEIS, Nevada* (March 2002).

Recommendation:

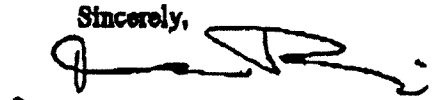
EPA recommends that FHWA and HDOT identify areas of high erosion potential due to construction and cut and fill operations and to commit to specific mitigation measures in the ROD.

Summary of Environmental Impacts

The FSEIS does not include a summary of environmental impacts common in the executive summary of most NEPA documents on transportation projects. Future NEPA documents would benefit greatly from a table summarizing the projected environmental impacts by alternative.

Thank you for this opportunity to comment on the FSEIS. We are disappointed that many of the issues we raised in our review of the DSEIS were not sufficiently addressed in the FSEIS. However, we strongly encourage FHWA and HDOT to make the commitments recommended above in the ROD. In the spirit of environmental streamlining, EPA continues to invite FHWA and HDOT to consult with EPA on questions they may have on EPA's comments and recommendations on future projects, prior to the publication of the Final NEPA document. Please contact me or Nova Blazej, the primary point of contact for this project, if you have further questions. Nova Blazej can be reached at 415-972-3846 or blazej.nova@epa.gov.

Sincerely,



for Lisa B. Hanf, Manager
Federal Activities Office

cc: Domingo Galicinao, FHWA-HI
Katiann Wong-Murillo, FHWA Western Resource Center

EXHIBIT "C-1"

Traffic Analysis

Purpose

This report analyzes current and projected future traffic conditions in the Lahaina Bypass Road project area and includes recommendations for appropriate mitigative measures. The analysis includes an examination of the Lahaina Bypass Road, including the connector and access roads that tie-in to the Lahaina Bypass Road, as well as the planned roadway projects and known development projects in the area.

Background

Currently, there is traffic congestion on Honoapiilani Highway in the vicinity of Lahainaluna Road during the AM and PM peak hours of traffic. The traffic congestion is primarily due to the high traffic demand from the north heading to/from areas east of Honoapiilani Highway via Lahainaluna Road which experiences delays during the AM and PM peak hours of traffic. The traffic demand on Lahainaluna Road appears to be generated by the three public schools located at the eastern end of Lahainaluna Road: Princess Nahi'ena'ena Elementary School, Lahaina Intermediate School and Lahainaluna High School (the only public intermediate and high schools in West Maui).

Honoapiilani Highway between Dickenson Street and Shaw Street is also congested during the PM peak hour of traffic due to the single lane in each direction on Honoapiilani Highway.

The Maui Long-Range Land Transportation Plan (MLRLTP), dated February 1997, projects that Honoapiilani Highway, from Launiupoko to Honokowai, in the Year 2020, will be operating at over capacity conditions during the AM and PM peak hours of traffic without the Lahaina Bypass Road. The MLRLTP recommends the construction of the Lahaina Bypass Road from Launiupoko to Honokowai to reduce the congestion in West Maui. The MLRLTP recommends that the first phase, a two-lane wide roadway, from Launiupoko to Dickenson Street Connector be constructed during the 2001-2005 timeframe. However, due to the current funding, the first phase of Lahaina Bypass Road may not be completed by 2005. The MLRLTP also recommends that the construction of the remainder of the Lahaina Bypass Road (Dickenson Street to Honokowai) and the widening of the first phase, to provide a four-lane wide roadway from Launiupoko to Honokowai be constructed during the 2006-2020 timeframe.

Planned Roadway Projects

The State Department of Transportation (SDOT) has proposed or completed roadway improvement projects in West Maui since the completion of the MLRLTP and these projects are included in the traffic analysis for the Year 2020. The descriptions of these roadway improvements are as follows.

Honoapiilani Highway Widening (Kaanapali Parkway to Honokowai Stream) In June 2000, the widening of a 2.2-mile segment of Honoapiilani Highway from two to four lanes was completed. The highway widening project was an element of the FEIS for the original Lahaina Bypass Road Project but has since been implemented on an independent basis.

Honoapiilani Highway Traffic Signal Modernization, Kaanapali Towards Lahaina

The nine traffic signal systems on Honoapiilani Highway from Leiali'i Parkway to Shaw Street were interconnected and synchronized. The project was completed in Year 2002.

Keawe Street Extension

The SDOT and County of Maui have proposed a mitigation alternative to relieve the existing traffic congestion at the Honoapiilani Highway/Lahainaluna Road intersection. This alternative calls for the extension of Keawe Street on the north side of Kahoma Stream to connect with the first segment of the Lahaina Bypass Road to create a mini-bypass around the Honoapiilani Highway/Lahainaluna Road intersection. Keawe Street currently provides access to the Lahaina Business Park from Honoapiilani Highway.

Widening of Honoapiilani Highway from Dickenson Street to Aholo Road

The widening of a 1.0-mile segment of Honoapiilani Highway from two to four lanes with dedicated left-turn lanes is anticipated to be completed by mid-2005.

Known Developments

Since the completion of the MLRLTP in 1997, several developers have proposed new or modified development plans for projects on the west side of Maui. The following section describes these known developments.

Villages of Leiali'i

An inquiry with the Housing and Community Development Corporation of Hawaii (HCDCH) at the time of this traffic analysis, indicated that the legal issues regarding the use of ceded lands for the proposed Villages of Leiali'i have not been resolved. The HCDCH did indicate that once the ceded land issues are resolved, the intent is to construct and sell the first phase of the Villages of Leiali'i (104 single-family residential dwelling units) where the roadway and utility infrastructure have already been completed. HCDCH indicated that they would re-evaluate the project's overall master plan for the remaining developable areas. HCDCH estimates that the build-out period for the Villages of Leiali'i will be 30 to 35 years. Therefore, since HCDCH does not have a master plan for the remaining developable areas, this traffic analysis includes the traffic generated by the first 104 single family dwelling units and **does not** include the traffic that would be generated by the remaining developable areas of the Villages of Leiali'i. Since traffic generated by the first 104 single-family dwelling units is relatively small, it is included in projected traffic volumes but excluded from Table 1.

Kaanapali 2020

Kaanapali Development Corp. (KDC) is proposing to modify the development plans for Puukolii Village and Project District 3 as described in the FSEIS. At the time of this study, KDC was in the process of preparing the necessary land use application documents for submittal to the public agencies. The current plan calls for the rezoning of approximately 1,155 acres at Kaanapali, Maui, Hawaii. Referred to as "Kaanapali 2020", the Project sets out a community vision for Kaanapali, incorporating a mix of residential, recreational, open space, conservation, agricultural and commercial uses located east of Honoapiilani Highway, west of Honokohau Ditch, south of Honokowai Stream and north of the Lahaina Civic and Recreational Center. KDC currently hopes to break ground by Year 2007 with completion of the project by Year 2027. Since the 1997 MLRLTP traffic projections are for the Year 2020, the traffic projections from the Kaanapali 2020 project will be based upon that portion of the Kaanapali 2020 development that would be completed by the Year 2020 and not the entire development.

Kapalua Mauka

Kapalua Mauka is proposed to be a 690-unit master-planned resort-home community, built on 925 acres of land west of the Kapalua Resort located north of Honokowai. Kapalua Mauka is estimated to be completed by Year 2020. Traffic projections from the proposed resort community were obtained from the Traffic Impact Analysis, dated December 2001, prepared by Parsons Brinckerhoff Quade & Douglas, Inc.

North Beach Makai

The Settlement Agreement (of the contested case land use hearing) for the development of the North Beach Makai area restricts the total number of units to 1,950 units which could be developed on the 96 acres of ocean front property. The North Beach Makai development is located north of the Kaanapali Resort, south of Honokowai, and between the shoreline and Honoapiilani Highway. At the time of this traffic analysis, the first 100 units were under construction with an anticipated completion in September 2003. This traffic study assumes that the entire 1,950 units would be completed by the Year 2020.

Table 1 summarizes the trips generated by the known developments.

Table 1
PEAK HOUR TRIPS
FOR KNOWN DEVELOPMENTS

Known Developments	Units	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Kaanapali 2020	Various	705	1,014	1,719	1,561	1,351	2,912
Kapalua Mauka	690 D.U.	118	48	166	106	141	247
North Beach Makai	1,950 ROOMS	566	240	806	548	750	1,298
Total Known Developments		***1,389***	***1,302***	***2,691***	***2,215***	***2,242***	***4,457***

D.U. – Dwelling Units

Trip Distribution/Assignment

Trip distribution is the directional distribution of vehicle trips from the known projects. Trip assignment refers to the allocation of vehicle trips to the surrounding roadway network based on the directional distribution. Trips generated by the known developments were assigned to Honoapiilani Highway based upon the traffic patterns from the MLRLTP and traffic studies for the specific West Maui projects. The distributed project trips were added to the MLRLTP Year 2020 traffic projections to project the future traffic volumes on Honoapiilani Highway between Launiupoko and Honokowai herein after referred to as "Year 2020 Traffic Projections". Peak hour traffic volumes along various sections of Honoapiilani Highway without the Lahaina Bypass Road are graphically depicted in Figure 1.

Future Year without the Lahaina Bypass Road

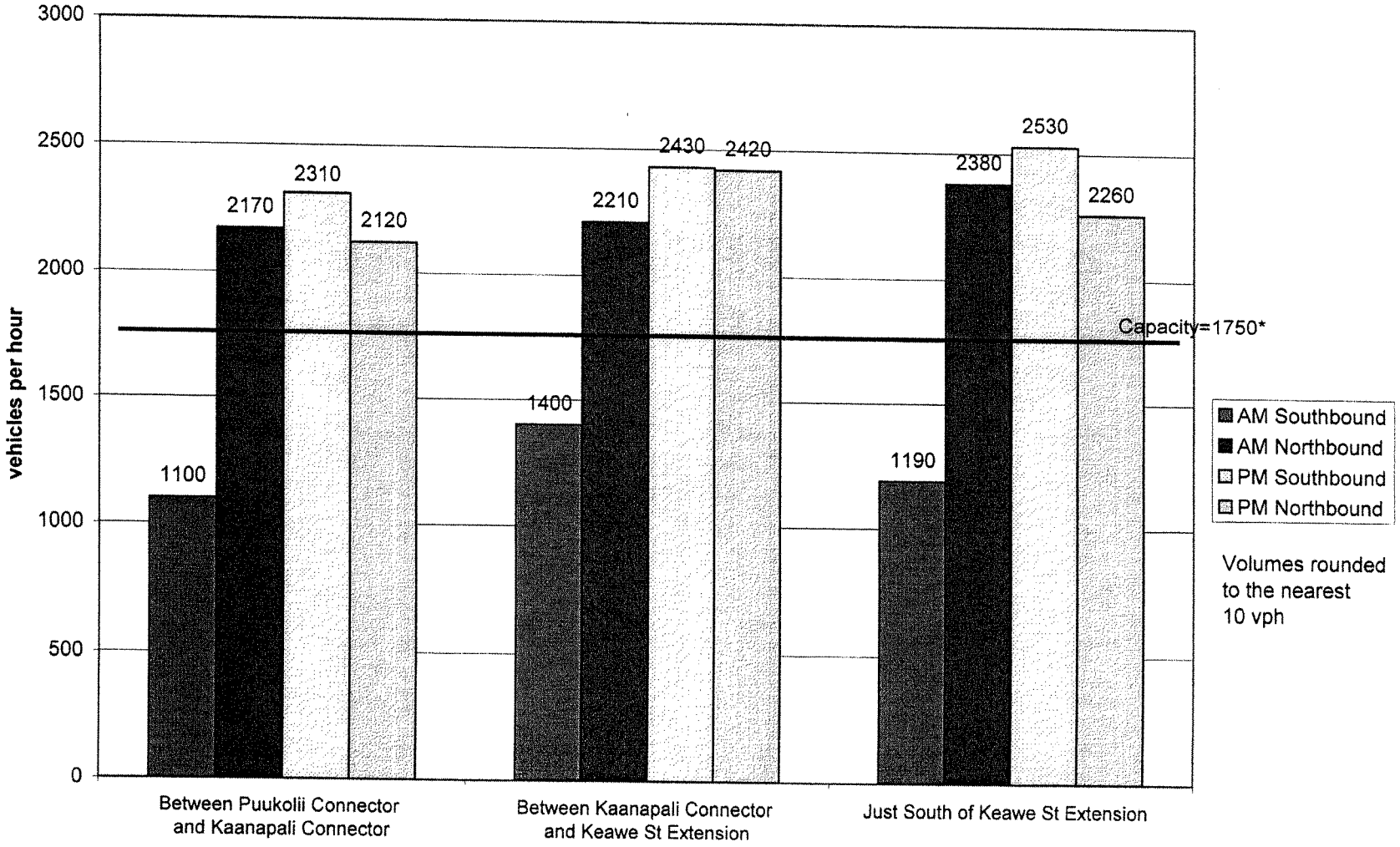
Based upon the Year 2020 Traffic Projections, Honoapiilani Highway will be operating at over capacity conditions from Launiupoko through Honokowai in the northbound direction during the AM peak hour of traffic and in the southbound direction during the PM peak hour of traffic. In addition, Honoapiilani Highway in the northbound direction between the Puukolii Connector and Dickenson Street will operate at over capacity conditions during the PM peak hour of traffic. Therefore, the Lahaina Bypass Road would be required to accommodate the future traffic demand. Figure 2 shows the traffic volumes and the Level of Service (LOS) for the Honoapiilani Highway/Connector Road intersections without the Lahaina Bypass Road.

Connector Roads Between Honoapiilani Highway and Lahaina Bypass Road

In the FSEIS for the Lahaina Bypass Road project, eight (8) connector and access roads were identified for vehicular circulation between the Lahaina Bypass Road and Honoapiilani Highway. The following are descriptions of the proposed connector and access roads.

Launiupoko Wayside Park Access Road/Kai Hele Ku Street Currently Kai Hele Ku Street is a private roadway that extends from Honoapiilani Highway east to serve the Mahanalua Nui and Makila residential communities. Once the bypass is constructed, the segment of Kai Hele Ku Street west of the bypass will become an access road to the Launiupoko Wayside Park while the east side would continue to serve the Mahanalua Nui and Makila residential communities.

Figure 1: Year 2020 Peak Hour of Traffic Volumes without Lahaina Bypass Road (4-lane) at Screenlines along Honoapiilani Highway (4-lane)



*Capacity Source: Maui Long-Range Land Transportation Plan, Kaku Associates, Inc., February 1997.

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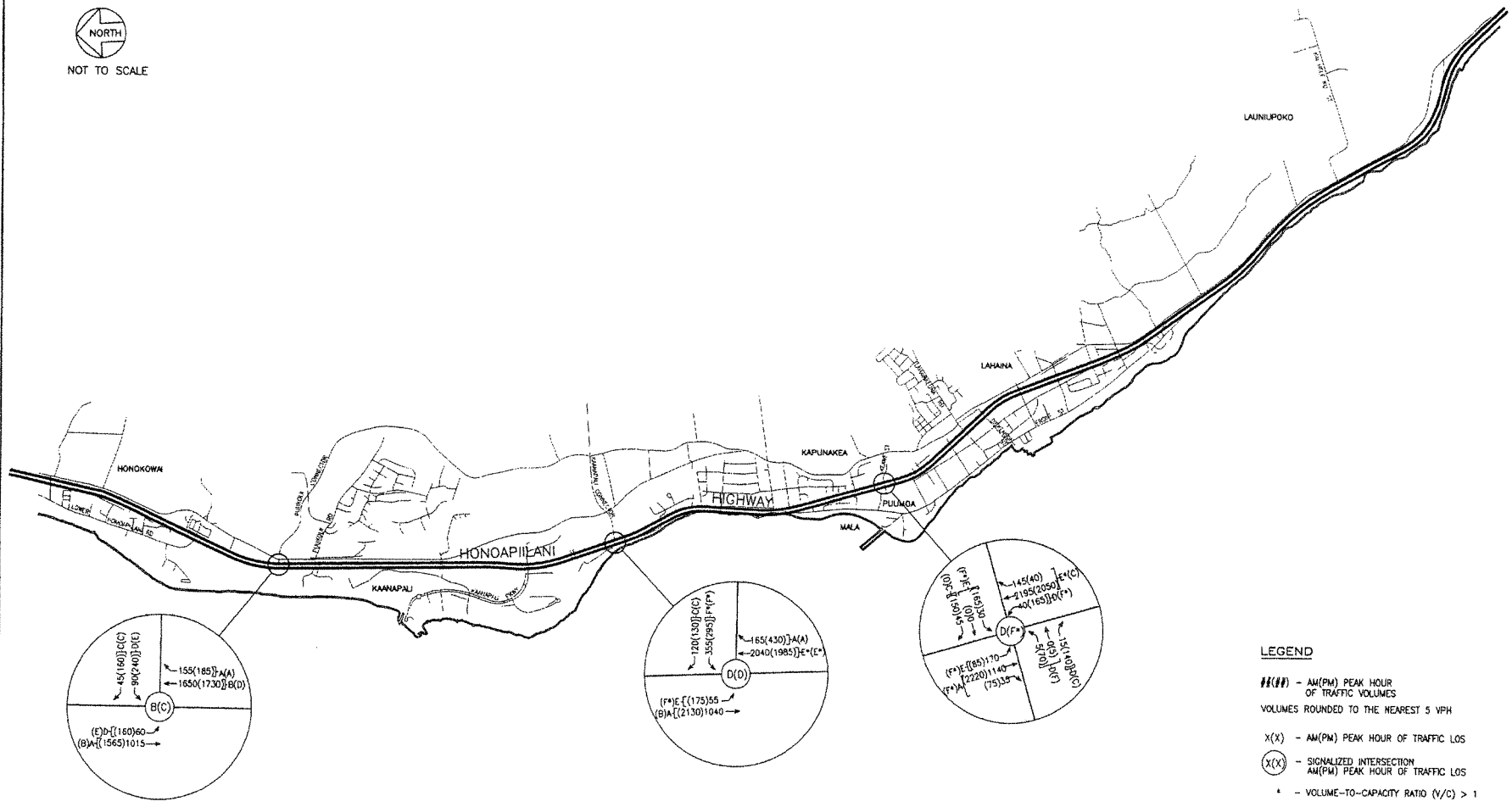


HONOAPIILANI HIGHWAY (FAP ROUTE 30) LAUNIUPOKO TO HONOKOWAI	AUSTIN, TSUTSUMI & ASSOCIATES, INC. ENGINEERS, SURVEYORS • HONOLULU, HAWAII	FIGURE 2
	YEAR 2020 PEAK HOUR OF TRAFFIC VOLUMES AND LEVEL OF SERVICE WITHOUT LAHAINA BYPASS ROAD	

Puamana Connector This connector road would be the southern most connector linking Honoapiilani Highway with the Lahaina Bypass Road. The existing Honoapiilani Highway would terminate at this intersection. This connector road will be constructed by others north of Puamana Park on the mauka side of Honoapiilani Highway.

Lahainaluna Road Bypass Access This access road is an element of the Lahaina Bypass Road project and would be constructed in conjunction with the Lahaina Bypass Road. Since the Lahaina Bypass Road will be grade separated from Lahainaluna Road, the Lahainaluna Bypass Access would be constructed to connect the segment of the Lahaina Bypass Road to Lahainaluna Road, providing access to the three schools and residential community at the eastern end of Lahainaluna Road.

Dickenson Street Connector Currently Dickenson Street serves the commercial and residential areas of Lahaina on the west side of Honoapiilani Highway, and extends from Front Street to its eastern terminus at Mill Street east of the highway. An extension of Dickenson Street to the Lahaina Bypass Road has been proposed by the County of Maui. However, due to the community's desire for the construction of a portion of the Lahaina Bypass Road (existing Ikena Avenue) intersecting an extension of Keawe Street as the preferred alternative, (Keawe Street extension), the construction of the Dickenson Street has been postponed indefinitely. Since the timeframe for this connector is unknown at this time, this project is not included in this study.

Kaanapali Connector This connector road is a component of the Lahaina Bypass Road Project and would be constructed in conjunction with the Lahaina Bypass Road. This connector would serve as the primary access to the Kaanapali Resort from the Lahaina Bypass Road, and provide access to Honoapiilani Highway and to the Lahaina Bypass Road for the southern portion of the proposed Kaanapali 2020 master-planned community development. If the Lahaina Bypass Road is not constructed, Road B of the proposed Kaanapali 2020 master-planned community development would be constructed at this location.

Puukolii Connector This connector road would be constructed as Road A of the proposed Kaanapali 2020 master-planned community development even if the Lahaina Bypass Road is not constructed. The connector road would serve the existing communities of Honokowai and the northern portion of the Kaanapali Resort.

Wahikuli Connector and Kapunakea Street Connector Since the development plans and schedule for the HCDCH Villages of Leiali'i are unknown at this time, the connector roadways, the Wahikuli Connector and the Kapunakea Street Connector, that would have been built by the developer, will not be considered in the analysis.

Future Year 2020 with the Lahaina Bypass Road

The Year 2020 Traffic Projections on Honoapiilani Highway were assigned to the Lahaina Bypass Road via the proposed connector roadways based upon the distribution patterns from the MLRLTP.

Connector Road Intersections

As signalized intersections, the following intersections will operate at LOS D or better during the AM and PM peak hours of traffic. It is recommended that traffic volumes in the study area be monitored and a traffic signal system be constructed at each of these intersections when warranted.

- Honoapiilani Highway/Puukolii Connector
- Honoapiilani Highway/Kaanapali Connector
- Honoapiilani Highway/Keawe Street Extension
- Lahaina Bypass Road/Puukolii Connector
- Lahaina Bypass Road/Kaanapali Connector
- Lahaina Bypass Road/Keawe Street Extension
- Lahaina Bypass Road/Lahainaluna Bypass Access Road
- Lahaina Bypass Road/Puamana Connector

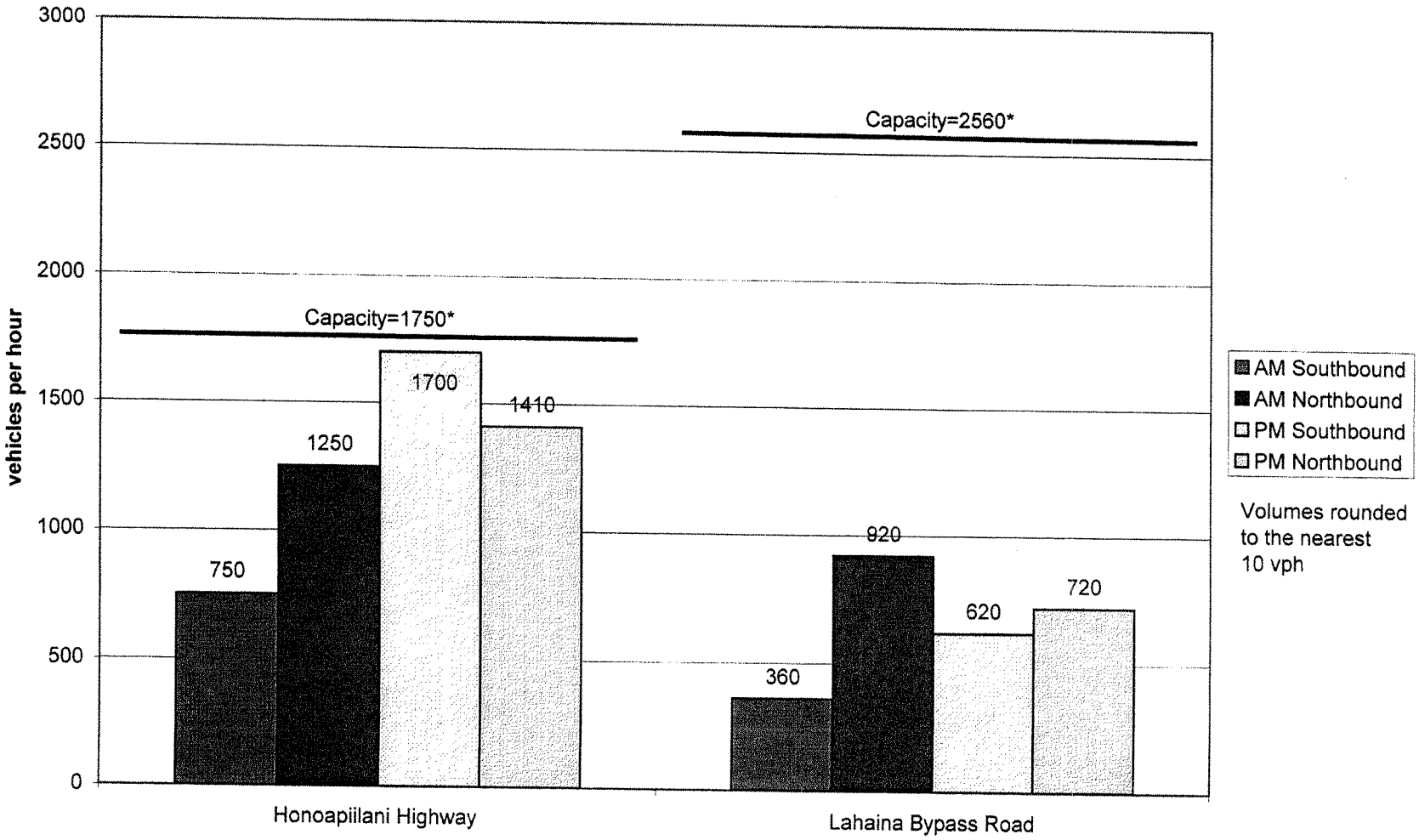
The Year 2020 Traffic Projections indicate that the Lahaina Bypass Road/Kai Hele Ku Street/Launiupoko Wayside Park Access Road and Lahainaluna Road/Lahainaluna Bypass Access Road intersections are not expected to warrant the installation of a traffic signal system. The Kai Hele Ku Street shared left-turn/through lanes on the stop-controlled approaches to the Lahaina Bypass Road will operate at LOS F conditions during the AM and PM peak hours of traffic. Also, the Lahainaluna Bypass Access Road left-turn lane on the stop-controlled approach to Lahainaluna Road will operate at LOS F conditions during the AM and PM peak hours of traffic. Although these movements will operate at LOS F, projected traffic volumes do not warrant installation of a traffic signal system at the Lahaina Bypass Road/Kai Heleku Street/Launiupoko Wayside Park Access Road and Lahainaluna Road/Lahainaluna Bypass Access Road intersections. The Manual on Uniform Traffic Control Devices (MUTCD) published by the Federal Highway Administration, recommends that a traffic signal system not be installed unless it is warranted. It is not uncommon, however, for a minor street approach to experience long delays especially when executing a left turn or crossing a major regional facility such as the Lahaina Bypass Road or Lahainaluna Road.

By Year 2020, a four (4) lane wide Lahaina Bypass Road between Launiupoko and Honokowai, will be required to accommodate the Year 2020 Traffic Projections with the planned roadway projects and the known developments. Figures 3 through 5 show the traffic projections graphically along the Lahaina Bypass Road and Honoapiilani Highway and the capacity of each roadway from the MLRLTP. Figure 6 shows the turning movement volumes and LOS at the connector road intersections with the Lahaina Bypass Road. Table 2 summarizes the LOS for the connector road intersections with Honoapiilani Highway and Lahaina Bypass Road. Figure 7 shows the recommended lane configurations at the connector road intersections with Honoapiilani Highway and the Lahaina Bypass Road.

Conclusions and Recommendations

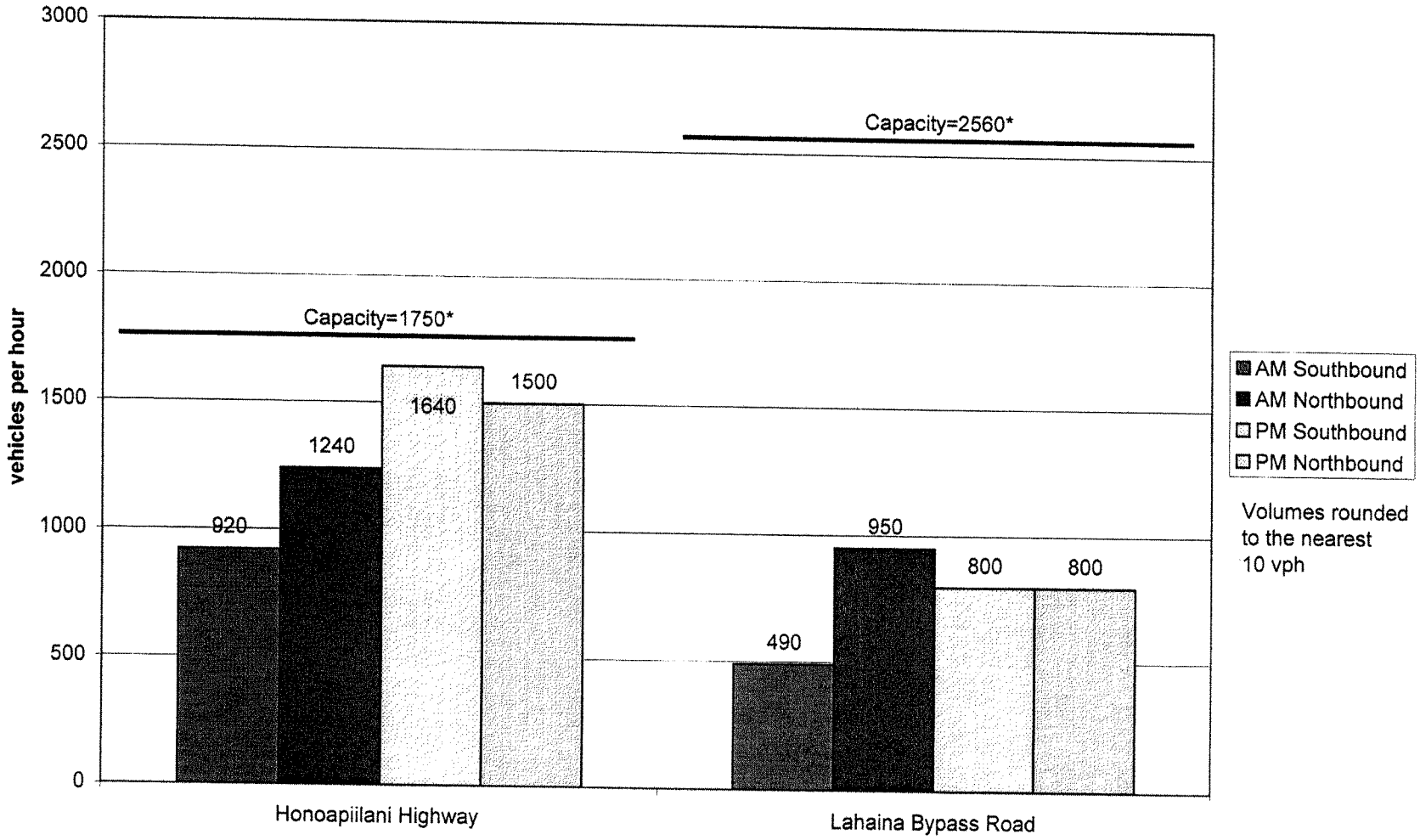
Construction of the Lahaina Bypass Road will be needed by the Year 2020 to accommodate the traffic on the west side of Maui. Construction of a two (2) lane wide Lahaina Bypass Road with truck climbing lanes could be constructed as an interim measure. Ultimately, a four (4) lane wide Lahaina Bypass Road would be required to accommodate Year 2020 Traffic Projections.

Figure 3: Year 2020 Peak Hour of Traffic Volumes with Lahaina Bypass Road (4-lane) at Screenline Between Puukolii Connector and Kaanapali Connector



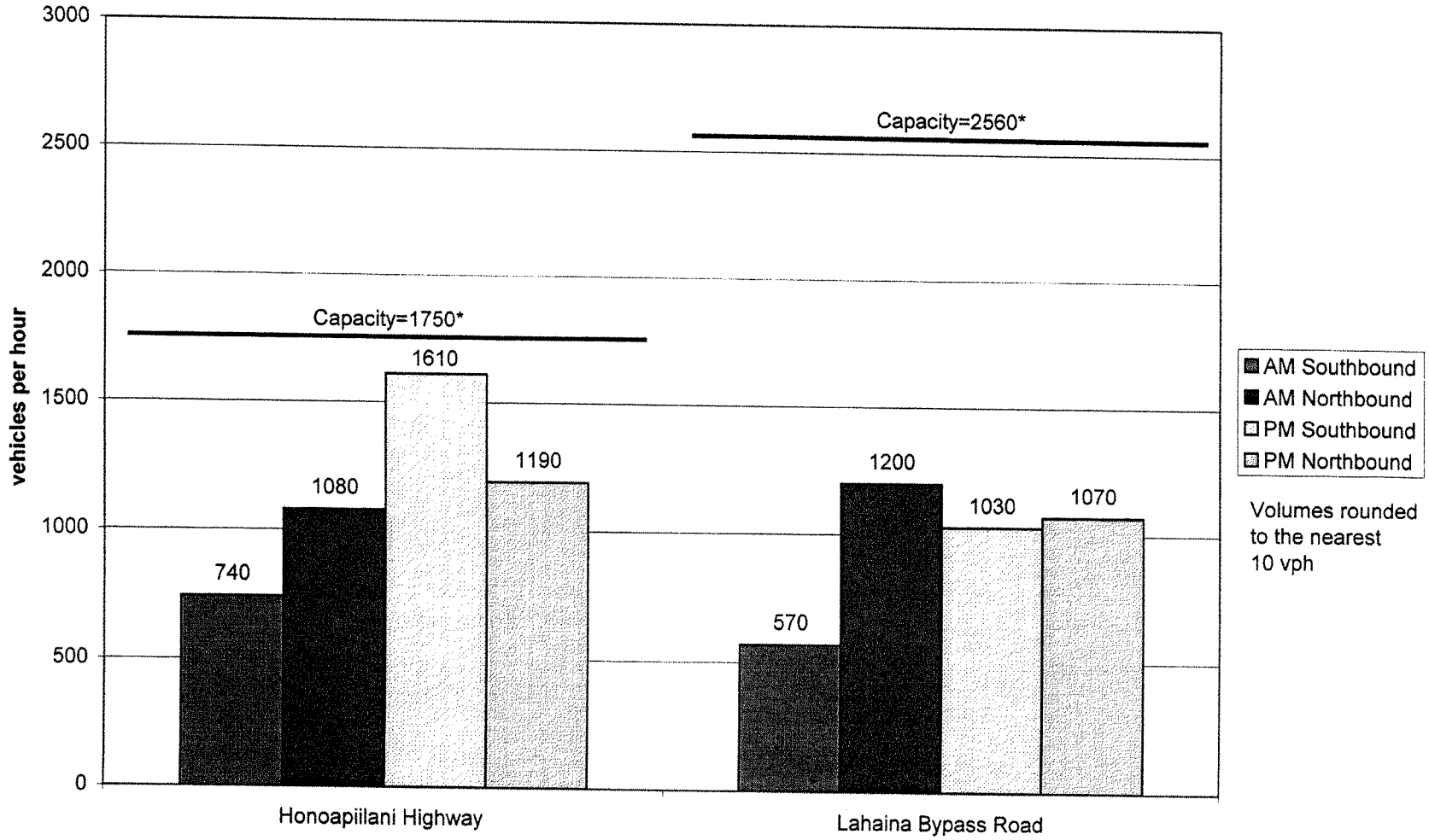
*Capacity Source: Maui Long-Range Land Transportation Plan, Kaku Associates, Inc., February 1997.

Figure 4: Year 2020 Peak Hour of Traffic Volumes with Lahaina Bypass Road (4-lane) at Screenline Between Kaanapali Connector and Keawe St Extension

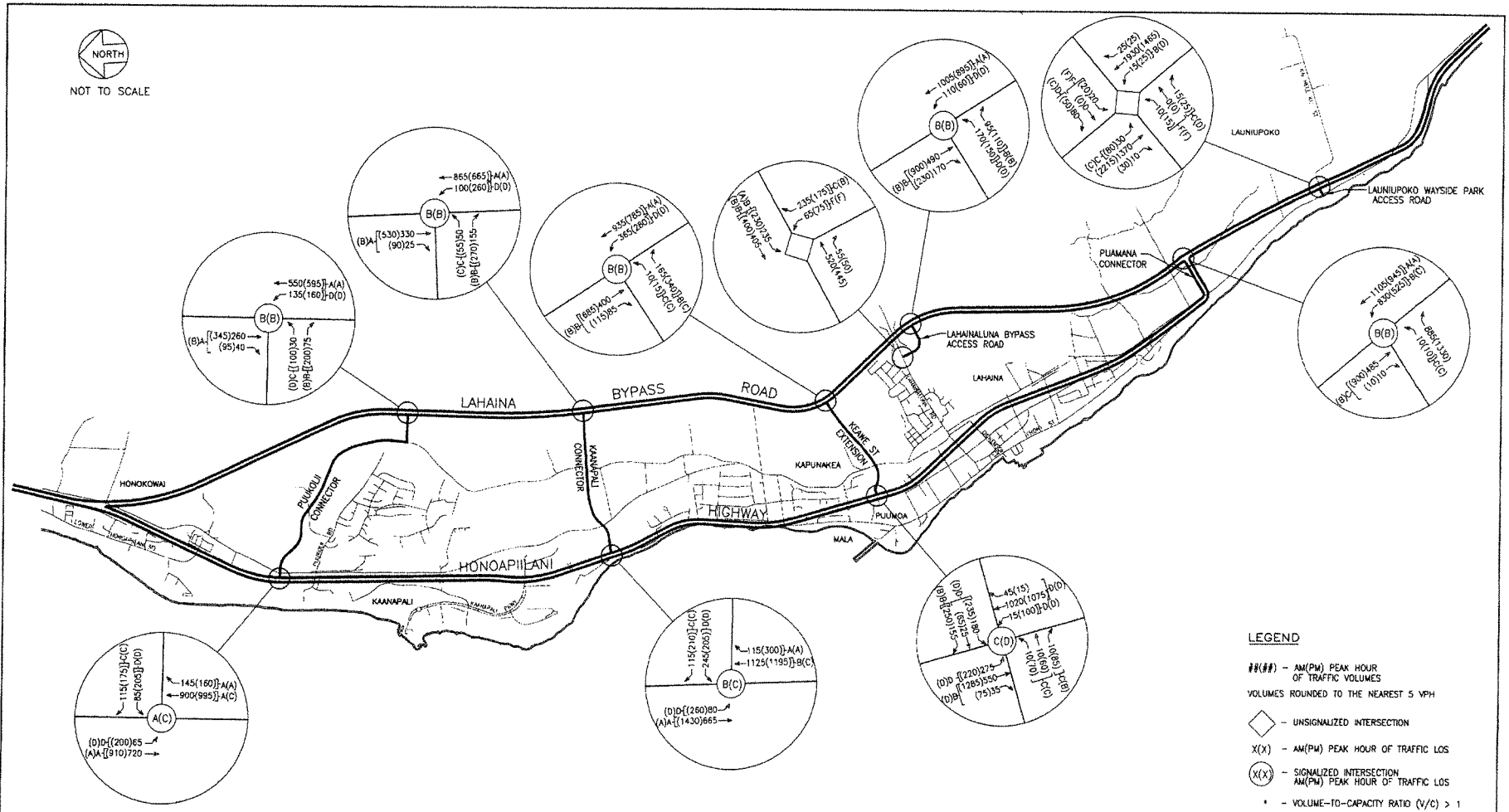


*Capacity Source: Maui Long-Range Land Transportation Plan, Kaku Associates, Inc., February 1997.

Figure 5: Year 2020 Peak Hour of Traffic Volumes with Lahaina Bypass Road (4-lane) at Screenline Just South of Keawe St Extension



*Capacity Source: Maui Long-Range Land Transportation Plan, Kaku Associates, Inc., February 1997.



HONOAPIILANI HIGHWAY
(FAP ROUTE 30)
LAUNIUPOKO TO HONOKOWAI

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

FIGURE
6

YEAR 2020 PEAK HOUR OF TRAFFIC VOLUMES AND LEVEL OF SERVICE WITH LAHAINA BYPASS ROAD

Table 2
Year 2020 Level of Service Summary

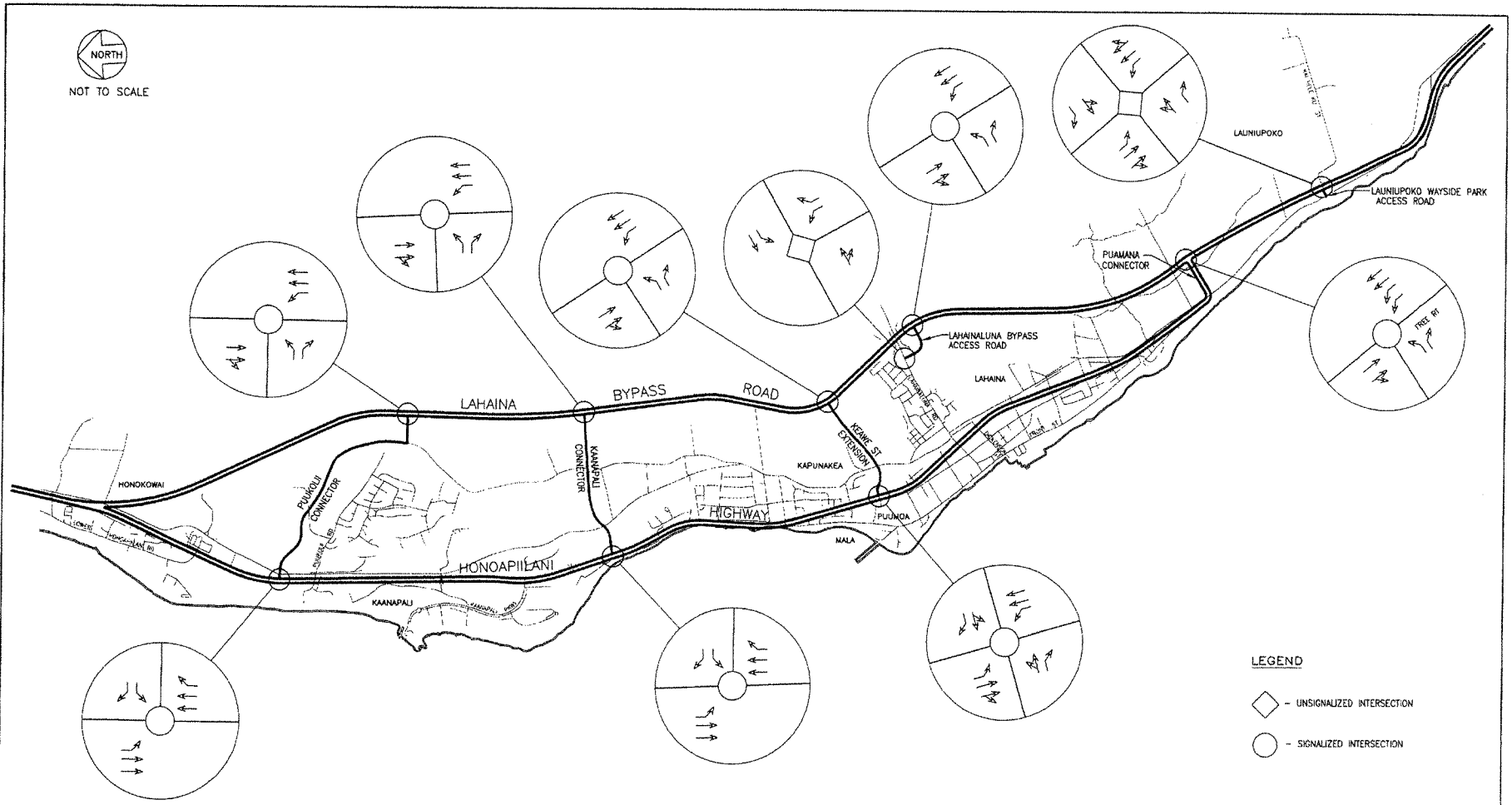
Intersection	Without Bypass		With Bypass	
	AM	PM	AM	PM
Puukolii Connector & Honoapiilani Highway				
NB TH	B	D	A	C
NB RT	A	A	A	A
SB LT	D	E	D	D
SB TH	A	B	A	A
WB LT	D	E	D	D
WB RT	C	C	C	C
Overall	B	C	A	C
Kaanapali Connector & Honoapiilani Highway				
NB TH	E*	E*	B	C
NB RT	A	A	A	A
SB LT	E	F*	D	D
SB TH	A	B	A	A
WB LT	F*	F*	D	D
WB RT	C	C	C	C
Overall	D	D	B	C
Keawe St Extension & Honoapiilani Highway				
NB LT	D	F*	D	D
NB TH+RT	E*	C	D	D
SB LT	E	F*	D	D
SB TH+RT	A	F*	B	D
WB LT+TH	E	F*	D	D
WB RT	C	D	B	B
EB LT+TH	D	F	C	C
EB RT	D	C	C	B
Overall	D	F*	C	D

*volume-to-capacity ratio (v/c) > 1

Table 2 (continued)
Year 2020 Level of Service Summary

Intersection	Without Bypass		With Bypass	
	AM	PM	AM	PM
Puukolii Connector & Lahaina Bypass Rd				
NB LT	-	-	D	D
NB TH	-	-	A	A
SB TH+RT	-	-	A	B
EB LT	-	-	C	D
EB RT	-	-	B	B
Overall	-	-	B	B
Kaanapali Connector & Lahaina Bypass Rd				
NB LT	-	-	D	D
NB TH	-	-	A	A
SB TH+RT	-	-	A	B
EB LT	-	-	C	C
EB RT	-	-	B	B
Overall	-	-	B	B
Keawe St Extension & Lahaina Bypass Rd				
NB LT	-	-	B	C
NB TH	-	-	A	A
SB TH+RT	-	-	C	C
EB LT	-	-	C	C
EB RT	-	-	A	B
Overall	-	-	B	B
Lahainaluna Bypass Access Rd & Lahaina Bypass Rd				
NB LT	-	-	C	C
NB TH	-	-	B	A
SB TH+RT	-	-	B	B
EB LT	-	-	C	C
EB RT	-	-	A	B
Overall	-	-	B	B
Lahainaluna Bypass Access Rd & Lahaina Bypass Rd				
NB LT	-	-	F	F
NB RT	-	-	C	B
WB LT	-	-	B	A
Puamana Connector & Lahaina Bypass Rd				
NB LT	-	-	B	C
NB TH	-	-	A	A
SB TH+RT	-	-	C	B
EB LT	-	-	C	C
Overall	-	-	B	B
Kai Hele Ku St/Launiupoko Wayside Park Access Rd & Lahaina Bypass Rd				
NB LT	-	-	B	D
SB LT	-	-	C	C
WB LT+TH	-	-	F	F
WB RT	-	-	D	C
EB LT+TH	-	-	F	F
EB RT	-	-	C	D

*volume-to-capacity ratio (v/c) > 1



HONOAPIILANI HIGHWAY
(FAP ROUTE 30)
LAUNIUPOKO TO HONOKOWAI

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

FIGURE 7

YEAR 2020 RECOMMENDED LANE CONFIGURATION WITH LAHAINA BYPASS ROAD

EXHIBIT "C-2"

Cumulative Impacts Analysis

CUMULATIVE IMPACTS ANALYSIS

As defined by 40 CFR 1508.7, cumulative impacts are defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

This cumulative impacts analysis examines past, present, and reasonably foreseeable future projects in the area that have the potential to cause adverse cumulative effects. The analysis uses the best available information at the present time to assess these projects and their potential impacts. Depending on the status of a particular project, each of the projects included in this cumulative impacts analysis is supported by different levels of information. Public documents, conceptual plans, documents or applications prepared for environmental reviews or regulatory approvals, and consultation with applicants and government agencies were the primary sources of this information. When adequate data on specific aspects of other projects was unavailable, and could not be obtained through reasonable efforts, professional judgment was used to estimate potential impacts.

A. PROJECTS INCLUDED IN THE CUMULATIVE IMPACTS ANALYSIS

The following criteria were considered in identifying past, present, and reasonable foreseeable future projects that could result in cumulative impacts to the region's resources.

1. Projects that are of a similar nature, could affect similar resources, or are located in geographic proximity to the proposed project.

2. Projects that have the potential to generate environmental impacts and when addressed collectively with the proposed project, could result in cumulative impacts to the environment.

3. Projects that are proposed for development that have received or are pending environmental and/or regulatory reviews or approvals and are expected to be implemented.

To determine significant cumulative impacts, the Lahaina Bypass Project was grouped together with several other past, present, and future transportation projects in the area. These projects include:

1. **Honoapiilani Highway Widening (Kaanapali Parkway to Honokowai Stream)** - This project was completed in June 2000 and involved the widening of a 2.2 mile segment of the highway from two to four lanes. The highway widening was a former element of the Lahaina Bypass Project and was implemented on an independent basis.

2. **Honoapiilani Highway Widening (Dickenson Street to Aholo Road)** - This proposed project will involve the widening of a 1.0 mile segment of the highway from two to four lanes. The completion of this widening project is expected to occur around mid-2005.

3. **Puukolii Connector (Honoapiilani Highway to Lahaina Bypass)** - This connector will serve as a major transportation element for Kaanapali 2020, a proposed master-planned project that supersedes Amfac's originally planned North Beach Mauka and Puukolii Village Projects. The completion of this connector is anticipated to occur within a 10 year time frame.

4. **Kaanapali Connector (Honoapiilani Highway to Lahaina Bypass)** - This proposed 1.0 mile connector is a component of the Lahaina Bypass Project. Completion of this connector is projected to occur within a 10 year horizon.

5. **Keawe Street Extension** - Keawe Street currently provides access to the Lahaina Business Park from Honoapiilani Highway. This proposed project will involve extending Keawe Street a distance of 0.5 mile to connect to a planned 0.5 mile segment of the Lahaina Bypass which will link the Keawe Street Extension to Lahainaluna Road. By providing an alternate transportation route, the "mini-bypass" created by these improvements will improve traffic conditions along Honoapiilani Highway and Lahainaluna Road caused by heavy school traffic in the mornings and afternoons.

This project will involve the participation of the County of Maui for the construction of the Keawe Street Extension and the State Department of Transportation (DOT) for the construction of the Bypass segment. Completion of the Keawe Street Extension and initial Lahaina Bypass segment is estimated to occur within a five year period.

6. **Lahainaluna Road Bypass Access** - This proposed 0.3 mile access road is an element of the Lahaina Bypass Project. Completion of this access road is anticipated to occur within a time frame of 10 years.

7. **Puamana Connector (Honoapiilani Highway to Lahaina Bypass)** - This proposed connector will be located in an area just north of Puamana Park. The Puamana Connector will facilitate access to the town of Lahaina and is projected to be completed within a 10 year horizon.

8. **Launiupoko Wayside Park Access Road (Honoapiilani Highway to Lahaina Bypass)** - Kai Hele Ku Street currently provides access to the Launiupoko and Mahanalua Nui agricultural houselot subdivisions. The 500-foot western leg of the Lahaina Bypass and Kai Hele Ku Street intersection will provide access to Launiupoko Wayside Park and the shoreline area between the park and Lahaina.

In addition to the preceding transportation projects, the following major non-transportation projects in the area were considered in the cumulative impacts analysis:

1. **Kapalua Mauka** - This proposed master-planned project encompasses 925 acres in the vicinity of the Kapalua Resort and involves the development of 690 single- and multi-family housing units, a secondary clubhouse and a 9-hole expansion of the 18-hole Village Course, as well as parks and open space. The build-out of this project is expected to occur over a 20 year period.

2. **Kaanapali 2020** - Proposed by Kaanapali Development Corporation (KDC), this community-based, master-planned project involves 1,155 acres at Kaanapali and includes the development of approximately 2,810 single- and multi-family housing units, schools, churches, parks, open space, a cultural center, an agricultural houselot subdivision, health and medical facilities, a

transit station/transportation center, mixed use and commercial facilities, as well as a golf course, club house, and golf maintenance facility. The Kaanapali 2020 project boundaries encompass those areas designated for Project District No. 3 (North Beach Mauka) and Puukolii Village, as described in the FSEIS (pages 133 to 134). Land use plans for the Kaanapali 2020 project conceptually defines uses and spatial allocations within the geographic boundaries of the North Beach Mauka and Puukolii Village areas. From a cumulative assessment standpoint, therefore, the Kaanapali 2020 project will be considered in lieu of the North Beach Mauka and Puukolii Village projects. It is estimated that the completion of Kaanapali 2020 will occur within a 20 year time frame.

3. **North Beach Makai** - The project area consists of about 94 acres situated at the northern extent of the Kaanapali Resort. A total of 1,950 hotel rooms are approved for development on the four hotel-zoned lots in this project area. The first phase (100 rooms) of the 280 room Kaanapali Ocean Resort is expected to be completed in September 2003. Thereafter, the construction of the second phase (100 rooms) and final phase (80 rooms) will commence with the completion of each preceding phase. The build-out of North Beach Makai is projected to occur within a 20 year horizon.

4. **Lahaina Flood Control Project** - This proposed project involves the construction of a 2.0 mile long stormwater diversion channel from Lahainaluna Road to an area south of Puamana Park. The channel is propoed to be grass-lined except for reinforced concrete sections near Lahainaluna Road and adjacent to the Wainee Reservoir. An inlet basin, three sediment basins, a debris basin, and outlet structures are also proposed. Depending on funding, the completion of this project is estimated to occur in approximately five years.

Two (2) other West Maui projects, the Villages at Leiali'i and the State Department of Hawaiian Home Lands (DHHL) master planned development, are acknowledged but not considered in the cumulative impact analysis. The Villages at Leiali'i project will require updates to master plan land use and development parameters at a future point in time. Due to legal issues regarding the use of ceded lands, the implementation of this project is stalled and its development schedule is

uncertain. While the Housing and Community Development Corporation of Hawaii (HCDCH) intends to construct 104 single-family housing units once these issues are resolved, it is thereafter planning a comprehensive re-evaluation of the project's master plan. Under these circumstances, the HCDCH estimates that the build-out period for the Villages of Leiali'i will be 30 to 35 years. See Attachment 1.

In addition, the DHHL is making plans for the future master-planned development of its 790 acres in the area between Honokowai and Mahinahina. As the DHHL is in the early stages of preliminary planning, and their master plan is presently of an indeterminate nature, and is subject to funding, this project has not been included in the cumulative impacts analysis.

It should also be noted that while the Wahikuli and Kapunakea Connectors are master-planned components of the Villages of Leiali'i, these connector roads have not been included in this cumulative impacts analysis due to the uncertainties surrounding this project. In addition, the County's plans to extend Dickenson Street and construct the north-south leg of the Lahainaluna Road Bypass Access, have been postponed indefinitely due to widespread community support for the Keawe Street Extension. Due to the indeterminate status of this project, the Dickenson Street Connector has not been included in this analysis.

B. GEOGRAPHIC SCOPE, TIME FRAME, AND BASELINE CONDITIONS

The geographic boundaries encompassed by this cumulative impacts analysis include lands in the vicinity of the Lahaina Bypass project, from Launiupoko to Honokowai, a distance of approximately 9.0 miles, and the lands to the north of the proposed project, from Honokowai to Kapalua, a distance of about 3.5 miles.

While the detailed implementation schedule for the Lahaina Bypass will be based on State funding allocation priorities, it is assumed that the completion of the Bypass will occur within a 20 year time frame.

Information on the timing and duration for the projects included in this cumulative impacts analysis was obtained through consultation with applicants and government agencies, as well as through reviews of documents and applications prepared for environmental reviews or regulatory approvals, when available. When this information was unavailable, and could not otherwise be obtained through reasonable efforts, professional judgment was used to estimate a reasonable implementation time frame.

The existing natural, physical, environmental, and socio-economic conditions in the area serve to define the baseline conditions for this cumulative impacts analysis.

C. ***POTENTIAL CUMULATIVE IMPACTS***

The cumulative impacts for the preceding transportation and non-transportation projects were identified by evaluating each project's individual impacts upon resources (see Table 1, Table 2, Table 2A and Table 3) combining the impacts by resource, and examining the cumulative impacts in terms of existing conditions and trends which could have an effect on the resources (see Table 4). The cumulative impacts to resources were then categorized as being either non-significant adverse or potentially adverse but capable of being mitigated.

D. ***NON-SIGNIFICANT ADVERSE IMPACTS***

There are six (6) resources in which the cumulative impacts of the projects are considered to be non-significant adverse. The resources

Table 1
ENVIRONMENTAL IMPACTS OF THE LAHAINA BYPASS PROJECT AND COMPLETED TRANSPORTATION PROJECTS IN THE AREA

Resource	***Lahaina Bypass***	***Honoapiilani Highway Widening (Kaanapali Parkway to Honokowai)***	***Launiupoko Wayside Park Access Road (Kai Hele Ku Street)***
Topography	Requires grubbing/grading within the right-of-way for roadway foundation and cut/fill for drainageway crossings; finish grades to follow existing contours where possible to minimize land form alterations.	Required cutting into slopes and constructing embankments along certain roadway sections.	Required grubbing and grading for roadway foundation; finish grades followed existing contours where possible to minimize landform alterations.
Plant/Animal Life	Requires removal of existing vegetation; no adverse impacts to threatened or endangered species and important plant and animal habitats.	Required removal of existing vegetation and landscaping along certain roadway sections; no adverse impacts to threatened or endangered species and important habitats.	Required removal of existing vegetation; no adverse impacts to threatened or endangered species and important habitats.
Water Quality	Finish contours to follow existing grades where possible to maintain existing drainage patterns; slight increase in surface runoff due to proposed paved surface area; may cause potential loading of runoff during construction; BMPs to be implemented for erosion and sediment control.	Finished contours followed existing grades where possible to maintain existing drainage patterns; increased existing paved surface area; slight increase in surface runoff; BMPs implemented during construction for erosion and sediment control.	Finish contours followed existing grades where possible to maintain existing drainage patterns; slight increase in surface runoff due to existing paved surface area; BMPs implemented during construction for erosion and sediment control.
Air Quality	Results in fugitive dust and vehicle exhaust emissions during construction; no adverse levels of exhaust emissions expected after construction.	Resulted in temporary dust and vehicle emissions during construction; no adverse levels of exhaust emissions after construction.	Resulted in temporary dust and vehicle emissions during construction; no adverse levels of exhaust emissions after construction.
Noise	Results in temporary construction noise impacts in developed areas; sound attenuating walls will be constructed along Ikena Avenue to mitigate long-term noise impacts to adjacent noise-sensitive receptors.	Resulted in temporary construction noise impacts in developed areas; minimal increase in long-term noise levels at two existing noise-sensitive receptor addressed through continued use of closure and air conditioning.	Resulted in temporary construction noise impacts; no adverse long-term noise impacts to noise-sensitive receptors.

Table 1 (continued)

Resource	*Lahaina Bypass*	*Honoapiilani Highway Widening (Kaanapali Parkway to Honokowai)*	*Launiupoko Wayside Park Access Road (Kai Hele Ku Street)*
Visual Resources	May be visible from lowland areas; results in new views from higher elevations and views of sound-attenuating walls along Ikena Avenue and overpass at the Lahainaluna Road crossing.	Had minimal visual impact.	Introduced new visual element to viewscape from lowland areas; results in new views of coastline.
Cultural Resources	Four archaeological sites were located within and adjacent to the right-of-way; measures to mitigate impacts to these sites have been approved by the State Historic Preservation Division (SHPD).	Had no impacts on known cultural resources.	Had no impacts on known cultural resources.
Socio-Economic Conditions	Results in economic benefits during construction; no adverse long-term socio-economic impacts expected.	Had beneficial economic effects during construction, no adverse long-term socio-economic impacts expected.	Had beneficial economic effects during construction, no adverse long-term socio-economic impacts expected.
Land Use	Converts formerly cultivated agricultural lands for roadway use; due to right-of-way acquisition, displaces residents from 16 homes along Ikena Avenue; requires coordination with the Bishop Estate and other landowners to ensure that their agricultural crops and supporting infrastructure will not be adversely affected by the project.	Required limited right-of-way acquisition; had no adverse land use impacts.	Converted formerly cultivated agricultural lands for roadway use; had no adverse land use impacts.
Public Services/ Facilities	Requires traffic control during construction in developed areas; provides an alternate travel route during emergencies; measures to mitigate impacts to Kelawea Mauka Park have been approved by the County of Maui.	Required traffic control during construction; additional lanes provide for improved emergency response times and the passage of traffic during accidents.	Required traffic control during construction; no adverse impacts to public services and facilities are anticipated.
Utilities	May require the relocation of power transmission lines and poles.	Required relocation of utilities and replacement of power poles.	Had no adverse impact on utilities.
Transportation	Improves traffic circulation, operations and safety; provides additional carrying capacity; serves as an alternate travel route.	Improved traffic circulation, operations and safety; provided additional capacity.	Improves traffic circulation, operations, and safety; provides access to Launiupoko Wayside Park and the shoreline area between the park and Lahaina upon completion of the Lahaina Bypass.

Table 2
ENVIRONMENTAL IMPACTS OF THE LAHAINA BYPASS PROJECT AND PROPOSED TRANSPORTATION PROJECTS IN THE AREA[a]

Resource	*Honoapiilani Highway Widening (Dickenson Street to Aholo Road)*	*Puukolii Connector*	*Kaanapali Connector*
Topography	Requires embankment along certain roadway sections.	Terrain to be locally modified to address design criteria for roadway foundation; finish grades to follow existing contours where possible to minimize landform alterations.	Terrain to be locally modified to address design criteria for roadway foundation; finish grades to follow existing contours where possible to minimize landform alterations.
Plant/Animal Life	May require removal of existing landscaping; no adverse impacts to threatened or endangered species and important habitats.	Currently fallow agricultural land; requires removal of existing vegetation; no adverse impacts to threatened or endangered species and important plant and animal habitats.	Currently fallow agricultural land; requires removal of existing vegetation; no adverse impacts to threatened or endangered species and important plant and animal habitats.
Water Quality	Finish contours to follow existing grades where possible to maintain existing drainage patterns; increases existing paved surface area; results in slight increase in surface runoff; may cause potential loading of runoff during construction; BMPs to be implemented for erosion and sediment control.	Finish contours to follow existing grades where possible to maintain existing drainage patterns; slight increase in surface runoff due to proposed paved surface area; may cause potential loading of runoff during construction; BMPs to be implemented for erosion and sedimentation control.	Finish contours to follow existing grades where possible to maintain existing drainage patterns; slight increase in surface runoff due to proposed paved surface area; may cause potential loading of runoff during construction; BMPs to be implemented for erosion and sediment control.
Air Quality	Results in fugitive dust and vehicle exhaust emissions during construction; no adverse levels of exhaust emissions expected after construction.	Results in fugitive dust and vehicle exhaust emissions during construction; no adverse levels of exhaust emissions expected after construction.	Results in fugitive dust and vehicle exhaust emissions during construction; no adverse levels of exhaust emissions expected after construction.
Noise	Results in temporary noise impacts during construction; may require measures to mitigate long-term noise impacts to some adjoining residential properties along the corridor.	Results in temporary construction noise impacts in developed areas; no adverse long-term noise impacts to noise-sensitive receptors are expected.	Results in temporary construction noise impacts in developed areas; no adverse long-term noise impacts to noise-sensitive receptors are expected.
Visual Resources	Has minimal visual impact.	Introduces new visual element to viewscape from lowland areas; results in new views from higher elevations.	Introduces new visual element to viewscape from lowland areas; results in new views from higher elevations.
Cultural Resources	Work to be conducted primarily within existing right-of-way; potential exists for the inadvertent discovery of previously unknown archaeological sites; coordination with SHPD to be conducted.	Roadway alignment falls within Kaanapali 2020 project area; underlying lands formerly used for sugar cane cultivation; no surface features anticipated; archaeological inventory survey for Kaanapali 2020 to be completed and reviewed by SHPD; as required, appropriate mitigative measures (i.e., monitoring) to be implemented in coordination with SHPD.	Roadway alignment falls within Kaanapali 2020 project area; underlying lands formerly used for sugar cane cultivation; no surface features anticipated; archaeological inventory survey for Kaanapali 2020 to be completed and reviewed by SHPD; as required, appropriate mitigative measures (i.e., monitoring) to be implemented in coordination with SHPD.

Table 2 (continued)

Resource	*Honoapiilani Highway Widening (Dickenson Street to Aholo Road)*	*Puukolii Connector*	*Kaanapali Connector*
Socio-Economic Conditions	Results in economic benefits during construction; no adverse long-term socio-economic impacts expected.	Results in economic benefits during construction; no adverse long-term socio-economic impacts expected.	Results in economic benefits during construction; no adverse long-term socio-economic impacts expected.
Land Use	May require limited right-of-way acquisition; has no adverse land use impacts.	Converts formerly cultivated agricultural lands for roadway use; lands currently fallow; enables development of lands along connector road segments.	Converts formerly cultivated agricultural lands for roadway use; lands currently fallow; enables development of lands along connector road segments.
Public Services/ Facilities	Requires traffic control during construction; additional lanes provide for improved emergency response times and the passage of traffic during accidents.	Requires traffic control during construction in developed areas; no adverse impacts to public services/ facilities.	Requires traffic control during construction in developed areas; no adverse impacts to public services/ facilities.
Utilities	May require minor relocation of utilities.	May require the relocation of power transmission lines and poles.	May require the relocation of power transmission lines and poles.
Transportation	Improves traffic circulation, operations and safety; provides additional capacity.	Improves traffic circulation, operations, and safety; provides a connection to the existing highway upon completion of the Lahaina Bypass.	Improves traffic circulation, operations, and safety; provides a connection to the existing highway upon completion of the Lahaina Bypass.

[a] A total of six (6) proposed transportation projects are analyzed. To facilitate presentation of the analysis, Table 2 addresses the following three (3) projects: Honoapiilani Highway Widening (Dickenson Street to Aholo Road); Puukolii Connector; and Kaanapali Connector. Table 2A completes the assessment by addressing the remaining three (3) projects: Keawe Street Extension; Lahainaluna Road Bypass Access; and Puamana Connector.

Table 2A
ENVIRONMENTAL IMPACTS OF THE LAHAINA BYPASS PROJECT AND PROPOSED TRANSPORTATION PROJECTS IN THE AREA[a]

Resource	Keawe Street Extension	Lahainaluna Road Bypass Access	Puamana Connector
Topography	Terrain to be locally modified to address design criteria for roadway foundation; finish grades to follow existing contours where possible to minimize landform alterations.	Terrain to be locally modified to address design criteria for roadway foundation; finish grades to follow existing contours where possible to minimize landform alterations.	Terrain to be locally modified to address design criteria for roadway foundation; finish grades to follow existing contours where possible to minimize landform alterations.
Plant/Animal Life	Currently fallow agricultural land; requires removal of existing vegetation; no adverse impacts to threatened or endangered species and important plant and animal habitats.	Currently fallow agricultural land; requires removal of existing vegetation; no adverse impacts to threatened or endangered species and important plant and animal habitats.	Currently fallow agricultural land; requires removal of existing vegetation; no adverse impacts to threatened or endangered species and important plant and animal habitats.
Water Quality	Finish contours to follow existing grades where possible to maintain existing drainage patterns; slight increase in surface runoff due to proposed paved surface area; may cause potential loading of runoff during construction; BMPs to be implemented for erosion and sediment control.	Finish contours to follow existing grades where possible to maintain existing drainage patterns; slight increase in surface runoff due to proposed paved surface area; may cause potential loading of runoff during construction; BMPs to be implemented for erosion and sediment control.	Finish contours to follow existing grades where possible to maintain existing drainage patterns; slight increase in surface runoff due to proposed paved surface area; may cause potential loading of runoff during construction; BMPs to be implemented for erosion and sediment control.
Air Quality	Results in fugitive dust and vehicle exhaust emissions during construction; no adverse levels of exhaust emissions expected after construction.	Results in fugitive dust and vehicle exhaust emissions during construction; no adverse levels of exhaust emissions expected after construction.	Results in fugitive dust and vehicle exhaust emissions during construction; no adverse levels of exhaust emissions expected after construction.
Noise	Results in temporary construction noise impacts in developed areas; no adverse long-term noise impacts to noise-sensitive receptors are expected.	Results in temporary construction noise impacts in developed areas; no adverse long-term noise impacts to noise-sensitive receptors are expected.	Results in temporary construction noise impacts in developed areas; no adverse long-term noise impacts to noise-sensitive receptors are expected.
Visual Resources	Introduces new visual element to viewscape from lowland areas; results in new views from higher elevations.	Has minimal visual impact.	Introduces new visual element to viewscape from lowland areas; results in new views of coastline.
Cultural Resources	Underlying lands formerly used for sugar cane cultivation; no surface features anticipated; further archaeological work may be required by the SHPD; as required, appropriate mitigation measures (e.g., monitoring) will be implemented in coordination with SHPD	Underlying lands formerly used for sugar cane cultivation; no surface features anticipated; further archaeological work may be required by the SHPD; as required, appropriate mitigation measures (e.g., monitoring) will be implemented in coordination with SHPD	Underlying lands formerly used for sugar cane cultivation; no surface features anticipated; further archaeological work may be required by the SHPD; as required, appropriate mitigation measures (e.g., monitoring) will be implemented in coordination with SHPD.
Socio-Economic Conditions	Results in economic benefits during construction; no adverse long-term socio-economic impacts expected.	Results in economic benefits during construction; no adverse long-term socio-economic impacts expected.	Results in economic benefits during construction; no adverse long-term socio-economic impacts expected.

Table 2A (continued)

Resource	*Keawe Street Extension*	*Lahainaluna Road Bypass Access*	*Puamana Connector*
Land Use	Converts formerly cultivated agricultural lands for roadway use; lands currently fallow; enables development of lands along connector road segments.	Converts formerly cultivated agricultural lands for roadway use; lands currently fallow; enables development of lands along connector road segments.	Converts formerly cultivated agricultural lands for roadway use; lands currently fallow; enables development of lands along connector road segments.
Public Services/ Facilities	Requires traffic control during construction in developed areas; no adverse impacts to public services/ facilities.	Requires traffic control during construction in developed areas; no adverse impacts to public services/ facilities.	Requires traffic control during construction in developed areas; no adverse impacts to public services/ facilities.
Utilities	May require the relocation of power transmission lines and poles.	Requires design coordination with the County of Maui's Lahaina Watershed Flood Control Project's inlet structure; require the relocation of power transmission lines and poles.	May require the relocation of power transmission lines and poles.
Transportation	Improves traffic circulation, operations, and safety; provides a connection to the existing highway upon completion of the Lahaina Bypass; provides an alternate travel route to schools and residences along Lahainaluna Road when combined with the initial segment of the Lahaina Bypass.	Improves traffic circulation, operation, and safety; provides a permanent connection from Lahainaluna Road to the Lahaina Bypass; facilitates access to Lahaina Town and the schools and residences along Lahainaluna Road.	Improves traffic circulation, operations, and safety; provides a connection to the existing highway upon completion of the Lahaina Bypass.

[a] A total of (6) proposed transportation projects are analyzed. To facilitate presentation of the analysis, Table 2 addresses the following (3) projects: Honoapiilani Highway Widening (Dickenson Street to Aholo Road); Puukolii Connector; and Kaanapali Connector. Table 2A completes the assessment by addressing the remaining three (3) projects: Keawe Street Extension; Lahainaluna Road Bypass Access; and Puamana Connector.

Table 3

ENVIRONMENTAL IMPACTS OF PROPOSED NON-TRANSPORTATION PROJECTS IN THE AREA

Resource	*Kapalua Mauka*	*Kaanapali 2020*	*North Beach Makai*	*Lahaina Flood Control Project*
Topography	Requires grubbing/grading for foundations and infrastructure; where possible, finish contours to follow existing grades to minimize landform alterations; no adverse impacts to the surrounding landform are expected.	Requires grubbing/grading for foundations and infrastructure; where possible, finish contours to follow existing grades to minimize landform alterations; no adverse impacts to the surrounding landform are expected.	Requires site work for foundations and infrastructure; due to fairly level terrain, grading will be minimal; habitable structures near the shoreline will need to be elevated above the base flood elevation; no adverse effects to the surrounding landform are expected.	Requires excavation and embankment for the construction of flood control features; no adverse impacts to the surrounding landform are expected.
Plant/Animal Life	Requires the clearing of pineapple fields and pasture land; existing plant and animal life is largely introduced; no adverse impacts to threatened or endangered species and important plant and animal habitats are expected.	Requires the clearing of agricultural lands formerly planted with sugar cane; existing plant and animal life is largely introduced; no adverse impacts to threatened or endangered species and important habitats are expected.	Requires the clearing of agricultural lands formerly planted with sugarcane; existing plant and animal life is largely introduced; no adverse impacts to threatened or endangered species and important habitats are expected.	Requires the clearing of agricultural lands formerly planted with sugarcane; existing plant and animal life is largely introduced; no adverse impacts to threatened or endangered species and important habitats are expected.
Water Quality	Increases impermeable surface areas and stormwater runoff; where possible, finished grades to follow existing contours to maintain existing drainage patterns; BMPs to be implemented to mitigate potential loading of runoff during construction and potential impacts to coastal water quality.	Increases impermeable surface areas and stormwater runoff; where possible, finished grades to follow existing contours to maintain existing drainage patterns; BMPs to be implemented to mitigate potential loading of runoff during construction and potential impacts to coastal water quality.	Increases impermeable surface areas and stormwater runoff; where possible, finished grades to follow existing contours to maintain existing drainage patterns; BMPs to be implemented to mitigate potential loading of runoff during construction and potential impacts to coastal water quality.	BMPs to be implemented to mitigate; potential loading of surface runoff during construction; reduces flood hazard potential and improves coastal water quality after completion.
Air Quality	Short-term impacts due to fugitive dust and vehicle emissions during construction; no long-term adverse air quality impacts expected.	Short-term impacts due to fugitive dust and vehicle emissions during construction; no long-term adverse air quality impacts expected.	Short-term impacts due to fugitive dust and vehicle emissions during construction; no long-term adverse air quality impacts expected.	Short-term impacts from fugitive dust and vehicle emissions during construction; no adverse post-development impacts to air quality expected.
Noise	Temporary construction noise impacts; post-development traffic noise levels not expected to have an adverse effect on the surrounding area.	Temporary construction noise impacts; post-development traffic noise levels not expected to have an adverse effect on the surrounding area.	Temporary construction noise impacts; post-development traffic noise levels not expected to have an adverse effect on the surrounding area.	Temporary increase in ambient noise levels during construction; no long-term adverse noise impacts expected.

Table 3 (continued)

Resource	*Kapalua Mauka*	*Kaanapali 2020*	*North Beach Makai*	*Lahaina Flood Control Project*
Visual Resources	Primarily results in new views of golf course and residential uses; parks, open space, landscaping and low-density nature of the project minimizes visual impacts on surroundings; no adverse visual impacts expected.	Primarily results in new views of golf course and residential uses; parks, open space, landscaping and low-density nature of the project minimizes visual impacts on surroundings; no adverse visual impacts expected.	Results in new view of hotel-related structures; while views from the existing highway will be altered, building placements to provide for view planes; compliance with North Beach Design Guidelines required to ensure architectural and landscape design integrity.	The flood control project is of a terrain-conforming nature; the diversion channel and debris basin may be visible from the lowlands; the grass-lined channel along the highway will be blend in with surrounding landscaping; no adverse visual impacts expected.
Cultural Resources	The project development area has been previously disturbed by extensive pineapple cultivation; while archaeological sites were found in gulch areas, no sites were located in the areas proposed for development.	Former sugar cane cultivation has substantially altered the project development area; archaeological inventory survey to be completed for Kaanapali 2020 project; appropriate mitigation to be implemented in coordination with SHPD.	The project development area has been extensively disturbed by previous sugar cane cultivation and the past construction of a small commuter air strip (since demolished); archaeological inventory survey completed; monitoring plan accepted by SHPD; determination of "no effect" issued.	Past sugar cane cultivation has substantially altered the project development area; archaeological inventory survey completed; burial found along project corridor; preservation plan reviewed by SHPD and Maui/Lanai Islands Burial Council; mitigation to be implemented in coordination with SHPD and Burial Council.
Socio-Economic Conditions	Increases housing inventory; generates construction- and occupancy-related employment and spending; accomodates population growth; increases property tax base and revenues.	Increases housing inventory; generates construction- and occupancy-related employment and spending; provides site for new hospital; accomodates population growth; increases property tax base and revenues.	Increases resort unit inventory; generates construction- and occupancy-related employment and spending; increases property tax base and revenues.	Generates construction-related employment and spending; mitigates threat to life and property in Lahaina Town area.

Table 3 (continued)

Resource	*Kapalua Mauka*	*Kaanapali 2020*	*North Beach Makai*	*Lahaina Flood Control Project*
Land Use	Converts pineapple fields and pasture land to resort-related residential and recreational uses; use of these lands is not expected to have an adverse impact on agricultural productivity.	Converts former sugar cane fields to residential, recreational, commercial, public/quasi-public, and agricultural houselot uses; use of these lands is not expected to have an adverse impact on agricultural productivity.	Converts former sugar cane fields to hotel and resort-related uses; use of these lands is not expected to have an adverse impact on the overall inventory of agricultural lands available for cultivation.	Converts former sugar cane fields to flood control system uses; use of these lands is not expected to have an adverse impact on the overall inventory of agricultural lands available for cultivation; requires coordination with the Bishop Estate to ensure that its private agricultural irrigation system and agricultural roads will not be affected by the project.
Public Services/ Facilities	Majority of residential units to be utilized as second/vacation homes; provides golf course and passive park uses; may increase the need for police, fire, and emergency services; may increase demand for public parks and school facilities; impact fees to be assessed.	Provides for school, health, golf course, and passive park uses; increases the need for police, fire, and emergency services; impacts from project to be mitigated by land use spatial allocation noted above, and impact fees to be assessed.	May increase the need for police, fire, and emergency services; additional park lands developed in connection with North Beach Makai subdivisions approval; impacts to school facilities not deemed significant.	Improves drainage system facilities in West Maui; no long-term impacts to public services or facilities.
Utilities	Increases demand for utility services; requires expansion of private water system and public sewer and power systems.	Increases demand for utility services; requires expansion of private water system and public sewer and power systems.	Increases demand for utility services; requires expansion of private water system and public sewer and power systems.	May require relocation of power lines and poles; no adverse impacts to utilities expected; due to proximity of the projects inlet structure to the Lahaina Bypass Access Road, design coordination between the two (2) projects will be required.

Table 3 (continued)

Resource	*Kapalua Mauka*	*Kaanapali 2020*	*North Beach Makai*	*Lahaina Flood Control Project*
Transportation	Results in short-term construction-related traffic impacts; majority of residences to be used on a seasonal basis as second/vacation homes; traffic impact analysis has been prepared to identify project-specific mitigative requirements.	Results in short-term construction-related traffic impacts; the construction of the Lahaina Bypass or an alternative measure would minimize potential long-term traffic impacts; traffic impact analysis to be prepared to address project-specific mitigative requirements.	Results in short-term construction-related traffic impacts; the construction of the Lahaina Bypass or an alternative measure would minimize potential long-term traffic impacts; traffic impact analysis required to address project-related mitigative requirements.	Requires traffic control during construction in developed areas; minimizes traffic congestion during storm events by eliminating flooding within the Lahaina Watershed.

Table 4
SUMMARY OF CUMULATIVE IMPACTS

Resource	*Existing Situation And Trends*	*Completion of Each Project*	*Project-level Mitigation or Corrective Action*	*Cumulative Environmental Consequences of These Projects*
Topography	The topography of the area is typified by the gentle slopes that extend from the foothills of the West Maui Mountains to the ocean and the relatively level plains along the coast; residential, commercial, and resort development has occurred along the coastal plain from Lahaina to Kapalua; the current trend toward in-fill development in the coastal plain is expected to continue, as well as the conversion of agricultural lands to other uses on the lands above the coastal plain.	Finished grades will follow existing contours to minimize landform alterations where possible.	Other than BMPs required for grading work, no mitigation for topography is proposed for any of the projects.	None of the projects are expected to have adverse cumulative impacts to the landform.
Plant/Animal Life	Most of the land in urban areas has been built-out and primarily consists of introduced plant species associated with residential, commercial, and resort landscaping; much of the lands along the slopes consists of pineapple fields, fallow agricultural lands, and introduced species of grasses, shrubs, and trees; in developed areas, animal life is largely introduced and consists of cats, dogs, rats, mice, and birds, while in undeveloped areas it is also introduced and typified by mice, rats, mongoose, feral cats and pigs, and birds; the trend toward in-fill development in urban areas and the conversion of agricultural lands to other uses on the lands above the coastal plain is expected to continue.	Each project will require the clearing of vegetation; most of the projects will include landscaping which will help offset the removal of vegetation; animal life in the project development areas are likely to relocate to adjacent undeveloped areas when construction occurs.	Most of the projects will involve the planting of landscaping or the replacement of vegetation; construction noise will have a temporary effect on animal life; if sensitive habitats are encountered, coordination with appropriate State and Federal agencies will be undertaken to identify applicable mitigative measures.	Each area proposed for development has been studied to determine the existence of threatened or endangered species or their habitats; where encountered, sensitive areas have been avoided; new development will impact introduced species primarily; adverse impacts to threatened or endangered species are not anticipated.

Table 4 (continued)

Resource	*Existing Situation And Trends*	*Completion of Each Project*	*Project-level Mitigation or Corrective Action*	*Cumulative Environmental Consequences of These Projects*
Water Quality	Various intermittent drainageways in the area ultimately empty into coastal waters; since the termination of sugar cane cultivation in 1999, sediment loading from fallow sugar cane fields has affected coastal water quality during heavy rainfall events; the development of fallow agricultural lands may increase the potential for non-point source pollution impacts, the trend toward the development of lands above the coastal plain is expected to continue as urban areas are built-out and agricultural lands are converted to other uses.	During the construction of these projects, sediment loading could occur in surface runoff; after construction, most of the projects will have more impervious surface areas which result in decreased absorption and increased surface runoff; the increase in runoff could carry more sediments and nutrients to coastal waters.	Site work will be phased and limited in area to minimize exposure and reduce pollution impacts; finish grades will follow existing contours to maintain existing drainage patterns where possible; erosion and sediment control measures will be implemented during construction; County drainage standards will mandate no increase in post-development runoff; projects that could potentially impact coastal water quality are subject to NPDES and other applicable permitting requirements.	Larger projects require development of master drainage plans; grading and drainage standards mandate implementation of BMPs; replacement of fallow agricultural lands with developed lands is guided by master plans and BMP implementation and together with the Lahaina Flood Control project are anticipated to maintain or improve regional water quality parameters.
Air Quality	Air quality in the area is good and within Federal and State standards; fugitive dust associated with agricultural cultivation has been substantially reduced due to the termination of sugar cane cultivation; high winds can generate dust impacts on lands that have been cleared or contain sparse vegetation; vehicle emissions have increased due to population growth but is within acceptable limits; the trend toward in-fill development in urban areas and the development of lands above the coastal plain is expected to continue.	Air quality impacts attibuted to construction are expected for each project; from a long-term perspective projects may have micro-climatic impacts such as increased shading, alteration of winds, and heat reflection or absorption; the non-transportation projects may cause more localized traffic congestion and vehicle emissions.	BMPs will implemented to mitigate construction-related air quality impacts; except for the flood control project, the non-transportation projects may require measures that de-emphasize the use of vehicles in favor of alternative modes of transportation.	Construction-related impacts will be managed incrementally as each phase of work is completed over the next several years; replacement of fallow agricultural lands with new urban-type uses is anticipated to mitigate current dust problems; cumulative impact of non-transportation projects attributed to additional vehicle emissions; air quality may be reduced at intersections or along roadway segments where traffic build-up occurs; traffic generated emissions have not been and are not anticipated to be an adverse consequence due to prevailing, climatic conditions in the region.

Table 4 (continued)

Resource	*Existing Situation And Trends*	*Completion of Each Project*	*Project-level Mitigation or Corrective Action*	*Cumulative Environmental Consequences of These Projects*
Noise	Vehicles along roadways and aircraft overflights are the primary sources of noise in the area; while ambient noise levels have increased due to in-fill development in urban areas and agricultural houselot subdivisions on former sugar cane lands, these levels are within acceptable limits; the implementation of sound-attenuation measures is required when impacts to noise-sensitive receptors exceed applicable noise criteria; the trend toward in-filling in urban areas and developing the lands above the coastal plain is expected to continue.	Each of the projects will have construction noise impacts and, with the exception of the flood control project, have the potential to increase noise levels to noise-sensitive receptors that may be in the area; for the Lahaina Bypass, a sound-attenuating wall will be constructed along Ikena Avenue to mitigate noise impacts to noise-sensitive receptors.	For all projects, community noise permits are required for construction activities that exceed State noise level standards; for State transportation projects, sound attenuation measures are required if there is a substantial increase (>15dB) in noise levels; depending on the nature of the project and the impact, mitigative measures include but are not limited to the use of landscaping, open space areas, closure and air conditioning, sound attenuating-walls, and building design, setbacks and orientation.	None of the transportation projects are expected to have adverse long-term noise impacts; long-term uses for future projects (housing; public/quasi-public; recreational uses) are not considered significant noise generators; from a cumulative standpoint, adverse impacts to noise characteristics in the region are not expected.
Visual Resources	The sloping terrain of the area provides views of the mountains from lowland areas and views of the coastline from upland areas; the termination of sugar cane cultivation has altered views east of the existing highway as fallow sugar cane fields occupied by scrub vegetation have replaced views of green sugar cane fields; the trend toward in-fill development in urban areas and the development of lands above the coastal plain is expected to continue.	All of the projects will alter the existing viewscape to some degree; the transportation projects and the flood control project do not include vertical structures which could affect view planes; master-planned communities, including the North Beach Makai Subdivision will utilize design guidelines to ensure that each project is implemented in a cohesive manner.	Due to their terrain-conforming design, no mitigative measures are required for the transportation and flood control projects; non-transportation projects will rely on landscaping, building setbacks, open space areas and architectural design guidelines to ensure visual cohesiveness.	At full build out, the visual landscape of the West Maui region will change from one dominated by agricultural lands to one having a mixture of agricultural lands, new public facilities and urban-type uses, including housing, quasi-public and recreational uses; the change in visual character will occur over time as each project is implemented; the rate at which projects are completed will dictate perceptions of view impacts; it is anticipated that the gradual implementation of project over the next 5 to 25 years will help to mitigate the changes in perception to the visual landscape.

Table 4 (continued)

Resource	*Existing Situation And Trends*	*Completion of Each Project*	*Project-level Mitigation or Corrective Action*	*Cumulative Environmental Consequences of These Projects*
Cultural Resources	Most of the lands underlying the transportation projects have been substantially altered due to previous roadway construction and sugar cane and pineapple cultivation; agricultural cultivation has extensively disturbed the areas proposed for development by the non-transportation projects; a few archaeological sites were located adjacent to, or in proximity of, the Lahaina Bypass corridor; a human burial was located on lands in the vicinity of the flood control project; while a number of archaeological sites were located in gulch areas and previously uncultivated agricultural lands, no sites were located in the areas proposed for development for the Kapalua Mauka and Kaanapali 2020 projects; the trend toward in-filling in urban areas and developing the lands above the coastal plain is expected to continue.	While there is the potential for inadvertent discovery during construction, none of the transportation and non-transportation projects would result in impacts to known cultural resources; mitigation measures for identified archaeological sites have been formulated as part of the State Historic Preservation Division's (SHPD) review and approval process.	Archaeological data recovery and preservation through avoidance will be implemented as mitigation for the archaeological sites associated with the Lahaina Bypass; while cultural resources are not expected to be impacted by the projects, archaeological monitoring during ground-altering construction activities will mitigate impacts in areas where there is discovery potential; in the event there are inadvertent finds, the find will be protected from damage, and the SHPD will be promptly notified to establish appropriate mitigative measures.	Inasmuch as archaeological studies have been or will be undertaken in connection with each project, appropriate mitigation protocols have been or will be identified; while cumulative impacts of all projects are not expected to be significant based on mitigation measures identified or to be identified for each project, ongoing coordination with SHPD will required through each phase of implementation for each project.
Socio-Economic Conditions	The population in West Maui has increased from around 14,500 in 1990 to nearly 18,000 in 2000 and is projected to grow to about 25,400 in 2020; housing demand has also increased from about 5,100 units in 1990 to around 6,300 units in 2000 and is projected to grow to approximately 9,800 units in 2020; population and housing are dispersed among the Lahaina area and the coastal communities from Honokowai to Kapalua, with the town of Lahaina serving as the area's population center; the inventory of affordable and moderate-income housing is relatively limited and unable to keep up with demand; in resort areas, the availability and demand for higher end units has been fairly balanced and steady and is expected to continue; the trend toward in-fill development in urban areas and the development of lands above the coastal plain is expected to continue.	The transportation projects are expected to improve efficiency in the movement of goods and services; the housing components of the non-transportation projects are expected to have a positive socio-economic effect by increasing housing opportunities for a range of income groups.	The transportation and flood control projects are not anticipated to have adverse socio-economic effects; North Beach Makai is subject to County affordable housing requirements for hotel-related development, while Kapalua Mauka and Kaanapali 2020 are subject to State and County affordable housing requirements for land use development; implementation of public-services and facilities is expected to occur concurrently, with each phase of project implementation.	All of the projects will have positive economic impacts due to construction-related employment and spending; the Lahaina Flood Control project is anticipated to result in socio-economic benefits due to reducing the potential for loss of life and property; transportation-related project are anticipated to result in positive benefits due to improved efficiency in the delivery of goods and services; master-planned projects will accommodate new populations and create new centers for residential living and employment; implementation of infrastructure and public services will need to be implemented concurrently with these projects.

Table 4 (continued)

Resource	*Existing Situation And Trends*	*Completion of Each Project*	*Project-level Mitigation or Corrective Action*	*Cumulative Environmental Consequences of These Projects*
Land Use	Developed areas include Lahaina Town, the Kaanapali and Kapalua Resorts, and the coastal communities from Honokowai to Kapalua; with the cessation of sugar cane cultivation in 1999, several low-density agricultural houselot subdivisions have been developed on former agricultural lands to the south of Lahaina; in 2001, Pioneer Mill terminated coffee cultivation on its lands above Kaanapali although a small-scale seed corn operation remains; the trend toward in-filling in urban areas and developing the lands above the coastal plain is expected to continue.	Residents from 16 homes along the Lahaina Bypass corridor on Ikena Avenue were displaced; none of the other projects involve displacement impacts; implementation of each project will incrementally alter land use spatial allocations within the West Maui region; individual project implementation may require amendments to the West Maui Community Plan	The Ikena Avenue residents displaced by right-of-way acquisition for the Lahaina Bypass were relocated to a new subdivision nearby; coordination with the Bishop Estate and other landowners will be required to ensure that their agricultural crops and supporting infrastructure are not adversely impacted by project development; if community plan and/or zoning amendments are sought and approved for each project, conditions of approval may be attached to mitigate project-specific impacts; such conditions may relate to density allocations, permitted land uses, special uses, etc.	When fully implemented, land use spatial allocations for the West Maui region will differ from current conditions; a larger percentage of mauka or upland areas will be converted to urban uses; reduction in lands allocated for agricultural uses are anticipated as economic/market trends make this use of the land less attractive; land use changes will be brought about incrementally to allow for provision of adequate infrastructure and public services; new land use patterns may result in shifts in population and employment centers within the region
Public Services/ Facilities	Police, fire, and emergency services and school and park facilities serve area residents; community needs are also met by a number of churches and shopping centers and other commercially or privately-provided services; the trend toward in-fill development in urban areas and the development of the lands above the coastal plain is expected to continue.	The transportation projects will not generate additional requirements for public services and facilities. The non-transportation projects may result in a need for additional police, fire, health, schools, parks, and solid waste disposal services and facilities.	The DOT and the County of Maui have agreed on measures to mitigate proximity impacts to Kelawea Mauka Park due to the location of the Lahaina Bypass; the remaining transportation projects will not adversely impact public services and facilities; non-transportation projects will be required to participate on a pro-rata basis towards the provision of public services and facilities; contributions may be in the form of land dedication (e.g., parks, schools, hospital land use set asides for Kaanapali 2020) or through cash payments.	Public services and facilities will not be adversely impacted by the transportation projects and the flood control project;developer contributions for public facilities and services to be made for projects implemented concurrently with development; lack of adequate services and facilities may be a basis for delaying non-governmental projects.

Table 4 (continued)

Resource	*Existing Situation And Trends*	*Completion of Each Project*	*Project-level Mitigation or Corrective Action*	*Cumulative Environmental Consequences of These Projects*
Utilities	The Kapalua and Kaanapali Resorts are served by private water systems and public sewer and power systems; other developed areas are served by public utility systems; utility lines for water, sewer, and power are generally located within existing highways and streets; the trend toward in-filling in urban areas and developing the lands above the coastal plain is expected to continue.	All of the new projects will involve excavation and most of these projects will require the relocation or installation of new utility lines; no extended service disruptions are expected for the relocation or installation of utilities.	No mitigation is required for the transportation projects; except for the flood control project, assessment and usage fees will be provided for the other non-transportation projects.	The transportation projects and the flood control project are not expected to have an adverse effect on utility systems; the other non-transportation projects will place additional needs for potable water, wastewater treatment, and power generation; should shortages, insufficient capacities, or a degradation of services result from these projects, projects will be delayed until service adequacy can be demonstrated.
Transportation	Honoapiilani Highway is the primary arterial serving the area; Lower Honoapiilani Road parallels Honoapiilani Highway and provides access to the coastal communities from Honokowai to Kapalua; Lower Honoapiilani Road handled all northbound traffic until Honoapiilani Highway was extended from Honokowai to Kapalua in the mid-1980's; the widening of Honoapiilani Highway from Kaanapali Parkway to Honokowai in 2000 increased the highway's capacity and improved overall traffic circulation in the area; the trend toward in-fill development in urban areas and the development of lands above the coastal plain is expected to continue.	The West Maui Community Plan, which guides regional growth and development, identifies the Lahaina Bypass as a major transportation element which will improve regional traffic circulation; the other transportation projects will improve traffic operations and safety, while the flood control project will reduce flooding, minimize sediment loading, and improve coastal water quality; each of the non-transportation projects has the potential to generate vehicle trips and increase congestion at surrounding intersections and roadways; Kaanapali 2020 includes bicycle and pedestrian paths and a trolley system for internal circulation.	Except for traffic controls during construction, no other mitigation is required for the transportation projects and the flood control project unless traffic warrants in the future trigger the need for signalized intersections; for the other non-transportation projects, project-related mitigation will be required; condition of entitlements approval may include the completion of the Lahaina Bypass.	The transportation projects will improve traffic circulation, operations, and safety and have a beneficial effect; the flood control project will not have an adverse impact on transportation systems. When fully built out, non-governmental projects will likely increase traffic volumes beyond capacities available on the existing roadway system; without the Lahaina Bypass or other significant mitigative measure, implementation of these projects will likely be delayed.

within this category include topography, plant and animal life, air quality, noise, visual and cultural resources.

For all of the projects, grading will follow existing contours where possible to minimize landform alterations thereby minimizing impacts to topography. In addition, plant and animal life is largely introduced and there are no threatened or endangered species and important plant and animal habitats in the project development areas. Air quality is not expected to be adversely impacted by the projects. While vehicle emissions may increase slightly, its overall effect is not expected to adversely affect air quality. Furthermore, the emissions will be dissipated over a broad area by prevailing wind patterns. Ambient noise conditions are not expected to be adversely affected. However, for the Lahaina Bypass, a sound-attenuating wall will be constructed along Ikena Avenue to mitigate noise level increases to adjoining noise-sensitive receptors. Landscaping, building setbacks, open space areas or other sound-attenuating measures are expected to minimize any noise level increases resulting from the Kapalua Mauka, Kaanapali 2020, and North Beach Makai projects. For nearly all the projects, the use of landscaping, open space areas, and architectural measures within the context of an overall integrated design framework will serve to mitigate visual impacts. For the Lahaina Bypass, impacts to cultural resources will be mitigated through data recovery and preservation of archaeological sites. In addition, impacts to the burial site around the Lahaina Flood Control project development will be mitigated by in situ preservation. For all of the projects, archaeological monitoring will be conducted, as required by SHPD, for ground-altering activities.

E. ***POTENTIALLY ADVERSE BUT MITIGATED IMPACTS***

The six (6) resources in which the cumulative impacts of the projects are

potentially adverse but are capable of being mitigated include water quality, socio-economic conditions, land use, public services and facilities, utilities, and transportation.

1. ***Water Quality***

Surface runoff and other non-point source pollutants can affect water quality if unmitigated. Construction activities on sites five acres or more are subject to the NPDES permitting process which requires the implementation of Best Management Practices (BMPs) to control erosion and sediment loss from those sites. In addition, the projects proposed for development are subject to the regulatory review and approval process. As part of this process, potential adverse impacts are identified and evaluated, and appropriate mitigative measures are prescribed. Specific compliance requirements may also be established depending on the potential severity of the impacts. While all of the projects can potentially impact water quality, the preceding measures are expected to mitigate the effects of non-point source pollution.

2. ***Socio-Economic***

Transportation projects are anticipated to have beneficial effects associated with greater efficiency in the movement of goods and services. The Lahaina Flood Control project is anticipated to have positive effects through reducing property damage and improving public safety from severe storm events. Other projects may have potentially adverse effects as community character is transformed with increased population. Issues such as crime and social service needs are typically cited as effects arising out of population growth. These effects can be mitigated if required services are provided prior to or concurrent with new growth and if growth is managed to

occur incrementally over time.

3. ***Land Use***

The projects described herein will alter the region's land use spatial allocations when fully developed. In-fill development in urban areas and the development of adjoining lands above the coastal plain will occur. Lands formerly used for agricultural cultivation will be converted to urban uses in connection with residential, recreational, commercial, hotel, public/quasi-public, and infastructure development. Effects of such changes include a shifting of population and employment centers which may affect regional demographic characteristics. Land use patterns in general, affect transportation behavior, infrastructure phasing programs, and governmental budgeting priorities. As such, the development of the West Maui area must be fully coordinated between private development interests and governmental agencies.

4. ***Public Services and Facilities***

Due to their nature, the transportation and flood control projects are not expected to have an adverse impact on public services and facilities. However, the other non-transportation projects will increase the need for public services and facilities. Additional police, fire, emergency, and solid waste disposal services will need to be provided. Public park and school facilities will also need to be expanded as well. Impacts to public services and facilities can be mitigated through dedication of land and/or the collection of assessment fees. If public services and facilities are considered inadequate, new services or facilities will need to be provided concurrent with or prior to the development of new non-governmental projects. If public services or facilities cannot be

provided in a timely manner, implementation of the non-governmental projects will be delayed.

5. *Utilities*

Except for the flood control project, the other non-transportation projects will create additional infrastructure demands for water, sewer, and power. Large master-planned projects will increase demand for utility services. As with public services and facilities, if infrastructure systems are deemed inadequate, upgrades and system expansion will be required prior to or concurrent with the development of new projects. If infrastructure systems cannot be provided in a timely manner, then implementation of non-governmental projects will be delayed.

6. *Transportation*

The transportation and flood control projects will not have an adverse affect on transportation systems. The other non-transportation projects will increase vehicle trips and contribute additional traffic. The Lahaina Bypass, or some alternative measure will be required prior to or concurrent with the development of larger master-planned projects. If transportation system improvements cannot be provided in a timely manner, the implementation of these projects will be delayed.

F. *SECONDARY IMPACTS*

As defined by CFR 1508.8, secondary impacts are impacts that have the potential to occur later in time or are farther removed in distance but are still reasonably foreseeable. They can be viewed as actions of others that are taken because of the presence of the project.

Secondary impacts from highway projects can occur because they can induce development by removing one of the impediments to growth - transportation access. Therefore, a certain amount of development can be expected from any transportation project. In particular, expansion of urban boundaries may be anticipated with the Lahaina Bypass. In particular, historic growth has occurred up to the limits of major coastal transportation highways. This is evident in South Maui with the Piilani Highway and in West Maui, with the existing Honoapiilani Highway. Potential new growth limits are evident with the proposed Kaanapali 2020 plan, as well as the previously completed Villages at Leiali'i master plan, which encompasses the Bypass alignment as part of their respective master land use plans.

Related to new growth are other secondary impacts which may include those effects to plant and animal life, water and air quality, noise, visual and cultural resources, socio-economic conditions, public services and facilities, and utilities.

Most of the land development that has occurred in recent years consists of in-fill development in urban areas and the conversion of agricultural lands to agricultural houselot subdivisions since the termination of sugar cane cultivation in 1999. The West Maui Community Plan identifies the Lahaina Bypass as an integral transportation element for improving traffic circulation in the region. The Bypass is already needed to handle existing traffic, especially around Lahaina Town. It will also accommodate the growth in traffic resulting from future development as well. Other factors that are also likely to have an effect on development in the area include population growth, economic conditions, and employment opportunities.

ATTACHMENT 1
TO
EXHIBIT "C-2"

Housing and Community Development Corporation of Hawaii Letter (February 28, 2003)

HWY-264

LINDA LINGLE
GOVERNOR

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION

ROBERT J. HALL
ACTING EXECUTIVE DIRECTOR

2003 MAR -4 A 11:09

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY REFER TO:

03:DEV/0094

RECEIVED
MAR 5 11 30 AM '03
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION

February 28, 2003

To: Rodney K. Haraga, Director
Department of Transportation

From: Robert J. Hall
Acting Executive Director

Subject: Lahaina By-Pass, FAP Route 30
Launiupoko to Honokowai
Villages of Leiali'i
Lahaina, Maui, Hawaii

The Housing and Community Development Corporation of Hawaii (HCDCH) acknowledges receipt of your letter dated February 25, 2003 requesting information on the current project scope and development schedule for the above subject Villages of Leiali'i project in Lahaina, Maui, Hawaii (VOL).

The VOL project is currently on hold pending resolution of the ceded land litigation. In December 2002, State Judge Sabrina McKenna ruled in favor of the State and the sale of ceded lands, however the decision is being appealed. We received final subdivision approval for 104 single-family lots in Village 1 – Phase 1A and sales will commence upon resolution of the ceded land litigation. We estimate resolution of the litigation in 2004.

Although the VOL project is currently master planned for 4,800 residential units, a golf course, two elementary schools, commercial area, parks, and an archaeological preserve, we plan to re-assess the master plan after the sale of Village 1 – Phase 1A. The estimated buildout period for the entire VOL project is 30 to 35 years.

Should there be any questions or comments regarding this matter, please contact Stan S. Fujimoto, Project Manager, at 587-0541.

EXHIBIT "C-3"

Best Management Practices

Section 1. Non-Point Source Pollution

1.1 Introduction

The State of Hawaii Department of Transportation (SDOT) is committed to implementing specific mitigation measures to protect the environment during construction and operation of the facility. This section outlines the types of non-point source pollution impacts anticipated with the proposed activity and specific mitigation measures to minimize impacts to the environment and natural resources.

1.2 Construction Operations

As discussed in the FSEIS Chapter IV, Section A.2, "potential non-point sources associated with construction activities include pesticides (insecticides, fungicides, herbicides), fertilizers (for vegetative stabilization), petrochemicals (oils, gasoline, asphalt degreasers), and construction chemicals (concrete products, sealers, paints, and wash water related to these products)." Additionally, sediment loads from erosion will contribute to non-point pollution impacts.

- The mass grading operations (i.e. cut and fill) will require denuding of vegetation in graded areas. Cut depths may be up to 40 feet in some areas, and fill heights may be up to 35 feet. In addition, construction work for bridge abutments and pier footings will occur in drainageways and gulches. As a result, sediment loads due to erosion in various exposed work areas are anticipated.
- Typical hazardous wastes will consist of materials such as motor oil, hydraulic fluid, antifreeze and battery acid. These waste byproducts are generated during the operations and maintenance of construction vehicles. The contractor's staging area or base yard, used as a mobilization or maintenance area for construction equipment, may be another generating area for such waste. No storage of hazardous wastes is anticipated.
- Solid waste will be collected at the construction site and transferred to dumpsters located in the base yard area. Solid waste will be transported to a Maui landfill on a regular basis.
- Sanitary sewage will be generated primarily by the construction crews. The use of portable or trailer type restrooms will address sanitary sewage collection.
- Air emissions will occur from passenger vehicles (jeeps, and pickup trucks), construction vehicles (bulldozers, loaders, scrapers, dump trucks etc.), and generators. Fugitive dust will be generated during roadway grading activities.

The major non-point source of pollution during the construction phase will be erosion and sediment generated in the mass grading operations. The use of interim measures addressed in the Erosion and Sediment Control Plan will be used to control the related impacts.

1.3 Facility Operations

The use of the Bypass by the motoring public will contribute as a non-point source of pollution:

- Pesticides and fertilizers will likely be used for the maintenance of the roadway shoulders, medians and planted areas within the right-of-way.
- Byproducts from the use of motor vehicles on the highway such as motor oil, transmission fluid, antifreeze, metallics, will be present in drainage runoff.
- Debris and litter from public use of the roadway will be transported via wind or water.

- Sediment will occur from erosion of slopes.
- Asphaltic or concrete pavement deterioration will occur over time.

Permanently constructed drainage improvements are designed to control the non-point sources of pollution, either through retardation of runoff or filtration. The selected measures will be addressed in the water quality section of the Erosion and Sediment Control Plan.

Section 2. Erosion and Sediment Control Plan

2.1 Regulatory Requirements

2.1.1 County Erosion & Sediment Control Requirements

Soil erosion and sedimentation control standards are a substantive part of the regulatory requirements and are subject to review and acceptance by the County of Maui.

Soil erosion and sedimentation control provisions will be designed to comply with standards established in Chapter 20.08 – Soil Erosion and Sedimentation Control of the Maui County Code. Chapter 20.08 provides the minimum standards to safeguard life and limb and to protect property by regulating and controlling the grubbing and grading operations within the County of Maui. Where applicable, the Soil Erosion Standards and Guidelines for the City and County of Honolulu will be used to augment the Maui standards. In addition, the Soil Conservation Service's Erosion and Sedimentation Control Guide for Hawaii and the Natural Resources Conservation Service's (NRCS) Soil Survey for Island of Maui will be used in the quantifying of soil erosion rates.

2.1.2 State of Hawaii Department of Health – National Pollutant Discharge Elimination System (NPDES) Program

For authorized discharge into State waters, water pollution control measures will comply with Hawaii Administrative Rules (HAR) Title 11, Department of Health, Chapter 55, Water Pollution Control. NPDES is a national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits under the Clean Water Act. HAR 11-55 meets or exceeds federal requirements for the State to administer the NPDES programs in Hawai`i. For clearing, grading and excavation work that results in the disturbance of one (1) acre of total land area or more, or part of a larger common plan of development, NPDES General Permit coverage is required.

To seek coverage under a general permit, the permittee will be required to complete and submit a Notice of Intent (NOI) Form 1, to the State Department of Health (DOH). To seek coverage under a general permit authorizing discharges and storm water associated with construction activity, the permittee will be required to complete and submit a NOI Form C to DOH. Form C requires the development of a construction site best management practice (BMP) plan. The BMP plan will be based on criteria established in HAR 11-55 Appendix C.

2.2 Erosion and Sediment Control Measures

The final design will incorporate an effective erosion and sediment control plan and Best Management Practices which addresses the following issues:

- Site development requirements; design and phasing of construction of improvements to have least impact on the existing terrain, and preservation of existing vegetation to the extent practicable.

- Minimization of grading activities in sensitive areas, such as drainageways, by clearing only areas that will be constructed immediately.
- Identification of specific areas that should be immediately stabilized due to high erosion potential or off-site damage potential (e.g. steep or long moderately steep slopes and areas near streams); and
- Stabilization of disturbed areas through temporary and/or permanent erosion control measures. Temporary measures will be installed prior to denuding of graded areas, as soon as grading is complete or when the areas will not be worked on for extended periods (e.g. More than two weeks).
- Dissipation and retardation, without concentration of flows in sensitive areas, to reduce the erosion potential.
- Reduction and filtration of sediment-laden runoff by diverting runoff to filtering and/or trapping controls, such as desilting basins or filtering swales

The complexity of the control plan will depend on site constraints and existing conditions, and regulatory requirements. The design and use of structural control devices will be integrated with the proposed improvements and infrastructure. A list of erosion and sediment control measures is included as an appendix to this Section.

2.2.1 Identifying Potential Erosion Hazards

Erosion hazard will be assessed or based on the following:

- Hydrologic and hydraulic conditions (i.e. intensity and depth of rainfall for the design storm, quantity and characteristics of runoff). The rainfall intensities will be based on figures for the Island of Maui as shown in the Rainfall Frequency Atlas of the Hawaiian Islands, by the U.S. Department of Commerce, Weather Bureau.
- Soil erodibility and severity rating number. Soil type will be determined through soil maps available from the U.S. Department of Agriculture, NRCS. The severity rating number will be determined based on the Soil Erosion and Sedimentation Control of the Maui County Code, the Soil Erosion Standards and Guidelines of the Department of Public Works, City and County of Honolulu, and the Erosion and Sediment Control Guide for Hawaii of the U.S. Department of Agriculture, Soil Conservation Service. The maximum standard severity rating number will be 50,000. The class of waters will be "AA."
- Extent of clearing, grubbing and graded area to construct the roadway and appurtenant improvements.
- Topography (steepness and length of slopes, existing drainage patterns, contributing off-site drainage areas)
- Capacity and velocity of outfall channels, streams, gullies, and downstream features.

Improvements will be positioned to be compatible with the topography while optimizing vertical and horizontal road alignments. Improvements will also be located in areas where least erodible soils exist at the construction zone and will not cause increased erosion to downstream areas.

2.3 Site Specific Measures

2.3.1 Description of Work

The project is approximately 9 miles long. Based on preliminary plan and profile of the roadway, the embankment quantity is 620,800 cubic yards (CY) and the excavation quantity is 1,610,900 CY, the cut and fill quantities are provided in Table 1. The types of soils that the Bypass will traverse are shown in Table 2. There are a total of six (6) distinct major drainageways that the Bypass will traverse. There are also a number of low areas which generally collects sheetflow runoff. Table 3 provides a matrix of the major drainageways, extent of contributing roadway length (using roadway stations), and the corresponding earthwork quantities and soil types. See Appendix for the Tables.

2.3.2 Erosion and Stormwater Quality Control

As part of the construction documents, the Erosion and Sediment Control Plan will contain the actual design of the mitigating measures, structure sizes, and stabilization methods for the potential erosion areas. A listing of Erosion and Sediment Control measures that will be used for this project is contained in the Appendix.

During construction, sediment basins will be located upstream of discharge points to settle sediment contained in the runoff. At the base of fill slopes, if the drainage pattern of the denuded area supplies low amounts of sheet flow (eg. one cubic foot per second or less), silt fences will be installed to filter the runoff sediments. For larger exposed areas, or major drainage areas, sediment basins will be constructed to protect outfall points. The basins, if required, will be kept in place and operational until the storm drainage system is functioning and the upstream area is stabilized.

It is anticipated that the primary permanent erosion control measures will consist of drainage improvements to divert runoff via natural and lined channels prior to entering the graded roadway area. Along the upslope perimeter of the work area, berms or ditches will be installed to divert the runoff from denuded areas. Within the roadway, drain inlets and swales within the median and shoulder areas will collect runoff and convey to downstream collection areas. Along low areas, berms and trapping facilities will be built to divert and detain the sediment-laden runoff. Downstream detention basins or filtration swales will be constructed to receive and filter the first flush of runoff from the roadway. The swales and basins will be designed to detain the volume of runoff for a period of time, prior to discharging, based on accepted stormwater quality standards. The discharge from these structures will be through a controlled outlet to maintain runoff rates into the major drainageways.

2.3.3 Order of Work

The initial clearing and grubbing operation is a critical stage of the implementation schedule. Before denuding a work area, erosion and sediment controls will be installed along the perimeter of the work area and at stormwater outlets. Placing initial controls along the perimeter will allow clearing and grubbing operations to begin with minimum obstructions and downstream erosion situations. In addition, work may continue with less interruption from the relocation or construction of additional remedial controls.

As construction progresses, the new drainage pattern will naturally create smaller, subdivided drainage areas which will require modification to the in-place erosion and sediment controls. This modification may include the elimination of unnecessary controls and the establishment of

new controls where appropriate. As disturbed areas are stabilized, sediment loads to sediment traps and basins will decrease.

As the permanent sediment control and drainage system become operational, the second phase of controls will be installed. Diversion berms will be relocated to account for the changing topography, unneeded traps and berms will be removed and storm drain inlets will be modified to function as sediment traps. Inlet protections will be installed and temporary sediment basins removed. Areas graded to final grades will be stabilized with vegetation and/or mulch. Removal of control devices will be contingent on the completion and stabilization of the work area.

2.4 Inspection and Maintenance Procedures for Control Measures

A standardized inspection checklist for the inspection of the control measures will be developed for the project and completed by the Contractor during the construction period. In general, structural measures will be inspected on a regular schedule and immediately following major rainstorm events to check for any damage and will be repaired immediately.

Outlet protection measures will also be inspected on a regular schedule and after storm periods to check for erosion and scouring. Trapping facilities will be cleaned out when its capacities are reduced by fifty percent. Trash, debris and sediment accumulation within sediment traps and basins and level spreaders will be removed to avoid reduction in the measures' efficiency and effectiveness. Trapped sediment will be hauled off-site and stockpiled or disposed of properly away from drainage ways, areas subject to erosion and discharge points.

Once damaged erosion control measures are reported, the degree of damage will be assessed and repair work will be done immediately to its original or better condition. Soil conditions, below, adjacent to and above the control measures will be inspected for stability and any damage as a result of the failed control measure will be restored to its original or better condition. The effectiveness of the control measures will be monitored and additional control measures will be implemented, as required, to improve the erosion and sediment control condition to acceptable levels.

Table 1. Earthwork Quantities

From Station	To Station	Embankment (CY)	Excavation (CY)
0+00 Honoapiilani Hwy.	116+50 Puukolii Connector	75,900	218,900
116+50 Puukolii Connector	181+00 Kaanapali Connector	96,300	51,600
181+00 Kaanapali Connector	211+00 Civic Center Connector	112,700	70,100
211+00 Civic Center Connector	258+00 Kapunakea Connector	86,000	120,400
258+00 Kapunakea Connector	298+00 Dickenson Connector	25,500	324,200
298+00 Dickenson Connector	472+38 Honoapiilani Hwy.	224,400	825,700
	TOTAL	620,800 CY	1,610,900 CY

Earthwork quantities were computed from preliminary Bypass plan and profile, and cross sections.

Table 2. Soil Types

Studies by the Department of Agriculture have identified 15 soil types for the island of Maui within the project alignment. The soil types can be grouped into: Lahaina Series (2 types), Molokai Series (2), Pulehu Series (1), Rock Land (1), Rough Broken and Stony Land (1), Stony Alluvial Land (1), Wahikuli Series (3), and Wainee Series (4). This table lists the various soil types as well as their slopes and runoff and erosion hazards.

Soil Type	Slope	Runoff and Erosion
Lahaina silty clay, LaB	3-7 percent	Runoff is slow, and the erosion hazard is slight.
Lahaina silty clay, LaC	7-15 percent	Runoff is medium, and the erosion hazard is moderate.
Molokai silty clay loam, MuB	3-7 percent	Runoff is slow to medium, and the erosion hazard is slight to moderate.
Molokai silty clay loam, MuC	7-15 percent	Runoff is medium to rapid, and the hazard of wind and water erosion is severe.
Pulehu cobbly clay loam, PtB	3-7 percent	Runoff is slow, and the erosion hazard is slight.
Stony Alluvial Land, rSM	3-15 percent	Located in Kauaula Gulch
Rock Land, rRK	Early level to very steep	Located in Kahoma Gulch and Honokowai Gulch
Rough Broken and Stony Land, rRS	Very steep	Located in Wahikuli Gulch, Hahakea Gulch, and Hanakaoo Gulch. Runoff is rapid and geologic erosion is active.
Wahikuli silty clay, WbB	3-7 percent	Runoff is slow, and the erosion hazard is slight.
Wahikuli stony silty clay, WcC	7-15 percent	Runoff is slow to medium, and the erosion hazard is slight to moderate.
Wahikuli very stony silty clay, WdB	3-7 percent	Runoff is slow, and the erosion hazard is slight.
Wainee extremely stony silty clay, WyB	3-7 percent	Runoff is slow, and the erosion hazard is slight.
Wainee extremely stony silty clay, WyC	7-15 percent	Runoff is slow to medium, and the erosion hazard is slight to moderate.
Wainee very stony silty clay, WxB	3-7 percent	Runoff is slow, and the erosion hazard is slight.
Wainee very stony silty clay, WxC	7-15 percent	N/a

Table 3. Major Drainageways

Drainageway	Contributing Bypass Length		Emb. (CY)	Exc. (CY)	Soil Types
	From Station	To Station			
Honokowai Gulch	0+00	73+00	43,200	73,300	LaB, LaC, MuB, rRK
Hanakaoo Gulch	73+00	116+00	32,600	145,700	MuB, rRS
Puukolii (1)	116+00	137+00	26,300	9,300	LaB, MuB, MuC
Wahikuli Gulch	137+00	162+00	38,100	25,500	LaB
Hahakea Gulch	162+00	180+00	32,000	16,700	LaB, LaC, rRS
Kaanapali (1)	180+00	195+00	9,000	46,100	LaC
Leialii (1)	195+00	261+00	167,600	33,500	LaC, WcB, WcC, WdB, rRK
Kahoma Stream	261+00	280+00	47,600	289,500	WcC, WdB, rRK, rRS
Lahaina (2)	280+00	359+00	16,300	646,900	WxB, WxC,WyB, WyC, rRK, rSM
Kauaula Stream (2)	359+00	368+00	31,300	11,600	WxB, rSM
Puamana (2)	368+00	424+00	115,800	280,800	PtB, WxC, WyB, WyC, rSM
Launiupoko	424+00	474+00	61,000	32,000	WyB, WxB, WxC
		TOTAL	620,800	1,610,900	

Notes:

(1) Generally, drainage runoff in these areas flow as sheetflow over fallow fields or in non-distinct drainage ditches within currently undeveloped areas.

(2) Drainage from these areas will be collected downstream by the County of Maui's Lahaina Watershed project, in cooperation with the U.S. Department of Agriculture, Natural Resource Conservation Service.

APPENDIX

Erosion and Sediment Control Measures

The objective of the erosion and sediment control measures is to enhance the work site's ability to control the energy, velocity and volume of rainfall runoff. The selection and placement of erosion and sediment controls is related to the site's drainage pattern which changes with each sequence of construction and task phasing. Erosion control measures are separated into three general categories: 1) site management; 2) soil stabilization; and 3) structural measures. Each category can be further divided into interim and permanent measures. Interim measures shall function only for the duration of the construction activity, or less, and control erosion only until the immediate area is stabilized. Permanent measures shall function beyond the construction duration and be designed to maintain stability of the site over a period of time.

A. Site Management Practices

Site management shall relate to the general scheduling of construction operations to reduce erosion potential. Site management measures implemented by the contractor shall consider the following issues:

- Limiting the amount of land area to be cleared at any one time. The acreage of disturbed or exposed lands shall comply with Chapter 20.08 of the Maui County Code;
- Specific sequencing of clearing and grading operations within disturbed areas and the installation of appropriate control measures;
- Phasing of construction operations based on the preceding two issues and seasonal weather patterns;
- Identification of specific areas that should be immediately stabilized due to high erosion potential or off-site damage potential (e.g. steep or long moderately steep slopes and areas near streams); and
- Implementation of a maintenance schedule for inspecting devices and cleaning of desilting facilities (sediment traps and basins).

Phasing and Scheduling of Construction

Before Grading and Construction

- Transport necessary erosion control materials to the project site.
- Store materials at pre-approved accessible locations.
- Determine work areas and identify potential erosion hazards.
- Implement the required erosion and sediment control measures as called for in the plans, including any permanent erosion control or filtration device features.

During Grading and Construction

- Maintain permanent and temporary control facilities.
- Routinely inspect permanent and temporary erosion control measures.

After Construction

- Maintain permanent control facilities.

- Remove temporary control facilities.
- Clean work area and return area to the existing condition or better.
- Remove surplus material.
- Remove equipment.
- Remove debris and waste material

B. Soil Stabilization Practices

Soil stabilization reduces erosion by absorbing rainfall energy, reducing overland flow velocity and increasing infiltration. The most widely used method of soil stabilization is vegetative and mulch ground covers.

1. Interim Stabilization

Interim stabilization shall be implemented immediately after the disturbed area has been graded or cleared of vegetation or, if final grading of the area will be suspended for more than 15 calendar days. Maintenance of the stabilization measure shall conform to these sections.

- **Hydromulching** - Grass is the most preferred form of vegetative ground cover. Hydromulch is a mixture of seed or cuttings, soil conditioner, soil binder and water, and is the easiest and fastest to apply. Hydromulch will require sufficient rainfall or irrigation (e.g. sprinkler system or water truck).

- **Geotextile Fabric -** For areas of high erosion potential, mulching shall incorporate geotextile fabrics (e.g. nets or mats). Geotextile nets incorporate heavy uniformly woven cloth, most notably jute yarn and mats are developed with porous degradable materials. To be effective, fabrics must be anchored securely in place as recommended by the manufacturer. Biodegradable geotextile fabrics may be used, thereby eliminating the requirement for subsequent removal.

- **Soil Binders** - Soil stabilization may also utilize soil binders which involve the use of biodegradable chemicals and synthetic materials to bind soil particles together. Soil binders protect seeding and sprigs from washing away and wind damage. Binders are most effective when sprayed over the soil surfaces.

  Other types of soil binders available are those that will improve the structural integrity and stability of the soil or road base and assist with dust control. Soil binders intended to be used for road work shall be coordinated with the SDOT. Soil binders shall be applied as recommended by the manufacturer.

- **Gravel Base** - In areas of heavy use for construction access, soil stabilization will be required by the use of aggregate gravel. A top layer of gravel may be spread over exposed surfaces to reduce erosion potential, gain structural stability and provide dust control. The preferred aggregate size for soil stabilization is #3 Fine (ASTM size 67).

- **Dust Control** - Dust control by water spraying on exposed or disturbed areas shall be applied throughout the construction period. Graded or exposed grounds shall be kept damp to prevent dust problems. The use of non-potable sources, such as the R-1 water available from the County's Lahaina Reclamation Facility shall be required.

2. Permanent Stabilization

Permanent vegetative cover shall be planted within a period of two weeks after the construction area has been constructed to final grades. All disturbed areas shall be designated for stabilization. Vegetative cover shall be planted, fertilized, and maintained in accordance with SDOT technical specifications.

For steep slopes, ditches and outlet locations of excessive runoff velocities, grouted rubble paving (GRP) may be used. The required cement, fine aggregate, water and rocks shall be transported and stored at the respective task area. GRP thickness, GRP slope, and subgrade preparation shall be based on existing conditions, hydraulic criteria and available materials.

C. Structural Measures

Structural measures are intended to either intercept runoff before exposed areas or divert runoff to controlled areas downstream from the denuded area. Other types of structural controls reduce runoff velocity or detain runoff to allow sediments to settle and or filter out. Structural controls are typically permanent measures.

- **Inlet Structures** - Inlet structures shall collect and direct runoff to storm drainage systems. Inlet structures, typically constructed of concrete, GRP or concrete rubble masonry (CRM), provide entry points to the storm drainage system. Inlet structures shall be designed to accommodate the hydraulic properties of inlet control. The design of inlet structures shall also be based on design criteria described in the Drainage Standards.
- **Outlet Structures** -Outlet structures shall provide an outfall for storm drainage systems. Outlet structures, typically constructed of concrete, GRP or CRM, shall be designed to accommodate the hydraulic properties of outlet control. The design of outlet structures shall also be based on design criteria described in the Drainage Standards. Energy dissipators shall be used to dissipate energy where necessary.
- **Culverts** - Drain pipe culvert and profile design shall be based on design criteria described in the Drainage Standards and standard engineering practices. Reinforced Concrete Pipe (RCP), High Density Polyethylene (HDPE) and Corrugated Aluminum Pipe (CAP) are expected to be the primary drain pipe culvert materials.
- **Velocity Dissipation Devices** - Velocity dissipation devices shall create additional resistance in the drainage way to reduce the erosive energy of stormwater flow.
- **Riprap Aprons** - Riprap aprons shall be used at the discharge end of slope drains and at outlets of pipes, ditches and channels, to dissipate velocity and stabilize the discharge point. Riprap aprons shall be constructed of placed rock or stone. Stone pieces shall be laid and fitted along side each other and bonded together by friction. The length, width and thickness of the apron shall be based on expected flows and hydraulic characteristics. Lined aprons will also provide some energy dissipation, thereby reducing the potential for downstream erosion. Outlet aprons will also

prevent scouring at the base of the slope and underneath the discharge end of the pipe outlet.

- **Check Dams** - Check dams are common energy dissipators. Check dams are typically constructed of stone and placed across the flow path in channels and ditches. Check dams may also be built from milled lumber, logs, covered brush bales or sandbags. Check dams shall be used where practical to reduce erosive velocities. Excavation of the sediment sump created on the upstream side of the check dam improves the performance and effectiveness of the check dam. Although check dams will provide additional desilting time and some sediment removal through filtering, check dams should not be used solely as a filtering device. The length, height and thickness of the dam structure shall be based on expected flows and hydraulic characteristics.

- **Weirs** - Weirs are used primarily as overflow control devices. However, they may also be used as velocity dissipation devices. Weirs shall be constructed and function similarly to the check dams. Weirs shall be located at the discharge end of detention basins and desilting ponds. Based on the characteristics of weir geometry, the flow rate and depth of flow may be controlled for a given incoming flow. Therefore, weirs shall serve as part of the outflow regulating system. The size and location of the weirs shall be based on expected flows and hydraulic characteristics.

- **Level Spreaders** - Level spreaders are outlets for dikes and diversions. Level spreaders convert concentrated runoff to sheet flow and release the runoff onto areas stabilized by existing vegetation. The level spreader consists of a wide channel with a level grade across the edge adjacent to a stabilized slope area. Concentrated runoff enters the level spreader and uniformly spills over the plane edge and down the slope as sheet flow. The minimum depth of a spreader is 6 inches, and is flat and uniform across its longitudinal length. The gradient of the adjacent slope below the device shall be 2H:1V or flatter to prevent sheet flow velocities from becoming too erosive. Level spreaders shall be located and used based on drainage patterns, expected flows and existing slope conditions.

- **Filtering Controls** - Filtering controls or sediment barriers shall be used to intercept and filter sheet flow runoff and small volumes of concentrated flow. These controls may be used as stand-alone controls or with sediment basins.

- **Inlet Protection** - Storm drain inlet protection is a filtering control placed around any inlet or drain to trap sediment. This measure prevents the sediment from entering the inlet structures and serves to prevent the silting of inlets, storm drainage culverts or receiving channels. Inlet protection shall be constructed of filter fabric, gravel, timber, or concrete block. Inlet protection shall be used where runoff is anticipated.

- **Silt Fences** - Silt fences or filter fences shall be used as an interim measure for sedimentation control in areas where installation of Diversion Berms are impractical. Silt fences shall be used to intercept sediment from shallow overland flow and in minor swales or drainage ways. Silt fences should not be used for controlling sediment-laden runoff from major drainage areas. The fence shall consist of wooden or metal posts with pervious geotextile fabric stretched across its front face. Wire or staples shall be used for additional reinforcement and to attach the fabric to the posts. Silt fences shall also be used to trap wind-blown silt and dust. Silt fences shall be installed prior to soil disturbance within a task area. The fences shall be placed across the bottom of a slope along a single contour line. Silt fences shall be

installed where sheet and "rill" erosion is a problem. Silt fences shall not be constructed in streams or major swales.

- **Sediment Traps** - Sediment traps shall be formed by excavating a pond or by placing an earthen embankment across a low area or drainage swale. For each trap, an outlet or spillway shall be constructed by using large stones or aggregate piles to slow the release of runoff. The traps are intended to retain the runoff long enough to allow sediment and silt to settle out. Sediment traps shall be lined with geotextile fabric for bank stabilization.

- **Gravel Filters** - Gravel or stone filter berms are temporary ridges constructed of loose gravel, stone, or crush rock. The filters may be installed as a measure to slow and filter flow, or divert flow from an exposed traveled way. Filter berms may also be used to direct runoff from an unstabilized traveled way to a stabilized outlet. Gravel berms are appropriate where roads are under construction and should accommodate vehicular traffic.

- **Sediment Basins** - A temporary sediment basin is a settling pond with a controlled storm water release structure used to collect and store sediment produced by runoff and construction activities. Sediment basins shall be constructed by excavation and/or placing an earthen embankment across a low area or drainage swale. Basins shall be designed to detain sediment-laden runoff from larger contributing drainage areas for a period of time to allow the majority of sediment to settle. If construction of a sediment basin is not feasible due to topographical features and/or lack of space for a specific area, then a sediment trap, silt fence or other combination of equivalent sediment control measures may be implemented.

  Sediment basins shall be designed with an outlet system, such as a riser pipe within a gravel berm and a spillway structure to slow the release of runoff and to provide sediment filtration. Basins shall be vegetated by seeding or mulching, to improve the sediment trapping efficiency.

  Temporary sediment basin shall be installed before the start of proposed clearing and grubbing work. Temporary sediment basins will be constructed downstream of any interceptor ditch but upstream of any drainageway or designated stream or gulch. Temporary sediment basins shall not be constructed within streams.

- **Slope Drains** - Slope drains are flexible or rigid pipes positioned along sloped areas in conjunction with sediment traps or diversion berms. The drains convey runoff, bypassing sloped or exposed areas at high risk of erosion, and discharging runoff to stabilized areas. Pipes shall be placed on the slope face and properly anchored.

- **Benches** - Benches shall be constructed at regular intervals on cut or fill slopes of certain height, to prevent runoff from proceeding down a slope at increasing volume and velocity. Instead, runoff will be redirected to an appropriate outlet point such as a sediment basin.

- **Interceptor Ditches** – Interceptor ditches can provide both temporary and permanent perimeter control around a graded area. Cut-off ditches shall be provided in sloped areas where it is advantageous to excavate a ditch rather than compact a berm. Ditches shall be stabilized with vegetation and shall include appropriate flow dissipators as required in sensitive areas.

Storm Water Management Controls

Detention Basins

Storm water detention facilities including detention basins and filtration swales, shall be designed to provide one or more of the following uses:

- Impound sediment-laden runoff for a period of time allowing the majority of the suspended solids and particles to settle by gravity;
- Reduce the velocities and turbulence of the runoff volumes (e.g. vegetated filtration swale located along the lower perimeter of an affected area but above drainageways); and
- Release collected runoff at a reduced flow rate (e.g. detention basin with spillway structure for controlled discharge rate).

Detention basins shall be designed to store stormwater runoff in a pond condition for a period of time necessary to allow sediment to settle. Detention basins are typically constructed of earth berms along the perimeter of an existing low-lying area with a controlled outlet and emergency spillway. The runoff is discharged at a controlled rate so as not to cause further downstream erosion.

The size of the basin is measured by its storage volume, which is a function of the amount of stored sediment and the volume of runoff entering and exiting the facility. Rainfall runoff volumes will be based on criteria established in the Drainage Standards. The Unit Hydrograph Method may be used to determine the required storage volume. Establishment of the Unit Hydrograph is based on a storm with recurrence interval of 100-years, and duration of 24 hours.

The emergency spillway shall be designed to allow larger storms to pass through the basin unimpeded. The outlet structure shall be designed to release collected runoff at existing flow rates.

Filtration Swales

Filtration swales shall be used to redirect and transport storm runoff from one location to another and provide for additional settling time by reducing flow velocities.

Filtration swales are normally located along roadways or drainage corridors and are sized based on available land and field conditions. The swales may be geotextile lined and vegetated depending on flow characteristics. The swales may be constructed using earth diversion berms, stabilized with vegetation.