TO: GENEVIEVE SALMONSON  
DIRECTOR OF ENVIRONMENTAL QUALITY CONTROL

FROM: RODNEY K. HARAGA  
DIRECTOR OF TRANSPORTATION

SUBJECT: FINDING OF NO SIGNIFICANT IMPACT FOR NORTH-SOUTH ROAD AND KAPOLEI PARKWAY, H-1 FREEWAY TO RENTON ROAD, EWA, OAHU, HAWAII


The Hawaii Department of Transportation has reviewed the comments received during the public comment period that began on July 23, 2004 and extended through the development of the Final Environmental Assessment (EA) for the subject project. Based on this review, HDOT has determined that this project will not have significant social, economic and environmental effects and will be issuing a Finding of No Significant Impact (FONSI). Please publish a notice of the FONSI determination and availability of the Final EA for the subject project in the October 8, 2004 OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, and four copies of the Final EA. Please call Nelson Sagum at 587-1834 if you have any questions.

Enclosures
NORTH-SOUTH ROAD
and KAPOLEI PARKWAY

Ewa, Oahu, Hawaii

FINAL ENVIRONMENTAL ASSESSMENT
FINDING OF NO SIGNIFICANT IMPACT

SEPTEMBER 2004
NORTH-SOUTH ROAD and KAPOLEI PARKWAY
H-1 Freeway to Renton Road
Ewa, Oahu, Hawaii
Final Environmental Assessment / Finding of No Significant Impact

Submitted Pursuant to
Chapter 343, Hawaii Revised Statutes
State of Hawaii Department of Transportation
Highways Division
and
City and County of Honolulu
Department of Transportation Services

SEP 27 2004
Date of Approval
Rodney K. Haraga,
Director of Transportation
Department of Transportation
State of Hawaii

9/23/04
Date of Approval
George "Keoki" Miyamoto, Director
Department of Transportation Services
City and County of Honolulu

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This Final Environmental Assessment / Finding of No Significant Impact documents the potential environmental impacts of a proposal to construct the North-South Road and to provide federal funding to support construction of a portion of Kapolei Parkway in Ewa, island of Oahu. The proposed project includes both the North-South Road, a principal arterial, which would extend from Interstate Route H-1 (H-1 Freeway) to the proposed Kapolei Parkway, and acceleration of the construction of a portion of Kapolei Parkway, from the North-South Road to Renton Road, such that this portion of Kapolei Parkway would be implemented within the same time frame as the North-South Road. North-South Road would be a State facility, and Kapolei Parkway would continue to be a City and County of Honolulu facility. The proposed Build Alternative also includes an interchange at its H-1 Freeway junction. The project would provide an alternative access to the Interstate System and would improve sub-regional mobility. With mitigation measures, the proposed project is not expected to result in any significant adverse impacts.
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EXECUTIVE SUMMARY

S.1 INTRODUCTION

S.1.1 APPLICANT AND PROJECT SUMMARY

The State of Hawaii Department of Transportation (HDOT) and City and County of Honolulu (City) Department of Transportation Services (DTS) are issuing this Final Environmental Assessment / Finding of No Significant Impact (FEA/FONSI) for the North-South Road and Kapolei Parkway project (formerly North-South Road project) in Ewa, Oahu, Hawaii (see Figure S-1), pursuant to Chapter 343 of the Hawaii Revised Statutes (HRS).

The North-South Road would be an approximately 2.2-mile federal-aid, limited-access, principal arterial highway, which would connect Interstate Route H-1 (H-1 Freeway) to the proposed Kapolei Parkway. The North-South Road project also includes the construction of: (1) a major interchange at its junction with the H-1 Freeway; (2) the North-South Road/Kapolei Parkway intersection; and (3) various drainage features, such as a drainage channel and detention basin associated with the proposed highway, as well as two crossings of Kaloi Gulch. The roadway section of concern for Kapolei Parkway is a segment approximately 0.7 mile in length from Renton Road to the City/State property line. This City section of Kapolei Parkway is a proposed federal-aid, arterial roadway, which would connect the proposed North-South Road to other existing, southerly portions of the Kapolei Parkway. North-South Road would be a State facility; the Kapolei Parkway section is proposed as a City facility, to be constructed by the City’s Department of Design and Construction (DDC). Throughout this FEA/FONSI, the term “Kapolei Parkway” will generally be used to refer to the proposed segment of the roadway between North-South Road and Renton Road, unless otherwise specified. North-South Road would encompass the intersection at Kapolei Parkway, such that Kapolei Parkway is defined as actually starting at the City/State property line where the intersection constructed by HDOT would end.

In September 1998, HDOT, in collaboration with the Federal Highway Administration (FHWA), publicly released a joint HRS Chapter 343 and National Environmental Policy Act (NEPA) Draft Environmental Assessment (1998 Draft EA) for the North-South Road project, which would extend from the H-1 Freeway to its future intersection with Kapolei Parkway. Kapolei Parkway was not included as part of the project action; rather it assumed that at that time Kapolei Parkway would be constructed by others before North-South Road. The City section of Kapolei Parkway must be operational for North-South Road to function properly. While the City would otherwise complete its portion of Kapolei Parkway with local funds within roughly the next 20 years, the 0.7-mile section of Kapolei Parkway must be operational for the North-South Road to function optimally and in accordance with its intended purpose.
Consequently, in order to ensure that a major portion of the Kapolei Parkway is completed within a reasonable time period of the completion of the North-South Road, federal funds are anticipated for the construction of a 0.7-mile section of the Kapolei Parkway.

Due to changes in existing conditions and the project definition since 1998, HDOT released a Revised Draft EA, which replaced the 1998 Draft EA. The Revised Draft EA was noticed on July 23, 2004 in the Office of Environmental Quality Control’s publication, The Environmental Notice. Following receipt and review of agency and public comments on the Revised Draft EA, HDOT rendered a decision that the proposed project will not result in a significant impact per criteria specified in HAR Section 11-200-12(b), and therefore, has issued this FEA/FONSI.

In its ultimate configuration, the North-South Road would include three vehicular lanes with shoulders in each direction, a median, and sidewalks on the both sides. An exclusive rapid transit corridor would be reserved within the 28-foot median of North-South Road. The east side of the roadway corridor within the roadway right-of-way (ROW) would be used for a shared bike path/access road to electric utility power lines and a drainage channel. The ultimate configuration of the City’s portion of Kapolei Parkway would similarly be three vehicular lanes in each direction, a median, and sidewalks (see Figures S-2 and S-3).

The interim phase of the project would consist of only the North-South Road interchange ramps with the H-1 Freeway oriented to and from the east (westbound off ramp and eastbound on ramp), the east half of North-South Road from the H-1 Freeway to Kapolei Parkway and the southern (makai) portion of Kapolei Parkway between Renton Road and North-South Road. The ultimate phase would implement the full build-out of the North-South Road Interchange, North-South Road, and Kapolei Parkway.

The project would also require implementation of environmental mitigation measures, intended to result in a project with minimal adverse environmental and social impacts. One major environmental mitigation measure included in the proposed project is the implementation of a Habitat Conservation Plan (HCP) for an endangered plant, the Koolaula, or Abutilon menziesii. The HCP stipulates propagation of existing plants in the proposed roadway ROW, establishment of at least three off-site outplanting sites for the plants, and creation of an 18-acre temporary Contingency Reserve Area where plants can be kept in their natural habitat until off-site planting sites achieve predetermined success criteria. Additional information about the HCP is provided in Section 3.7.

Another major mitigation measure included as an integral part of the proposed project is a drainage system that includes a contribution towards the regional drainage system. A regional drainage system is required to support the urban development proposed for the area. The drainage elements included in this project are the following:

North-South Road and Kapolei Parkway Roadside Drainage Facilities:

a. Roadside Drainage Facilities
b. Interchange and Roadway Portions over the SOBA Recharge Area
c. Roadway Portions below the SOBA Recharge Area

d. Interim Interceptor Ditches

e. Regional Drainage Channel

f. Drainage Retention / Detention Basin

g. Interface at Ewa Villages Golf Course

h. Drainage Channel Bridge Crossings

i. Kaloi Gulch Bridge Crossings

j. Kaloi Gulch Culvert Modification at H-1

k. Cross-Drains for Future Developments

The drainage system has been designed in consideration of two watershed build-out conditions, interim and ultimate. Interim watershed conditions assume that adjacent areas in East Kapolei are not developed. Ultimate watershed conditions assume that adjacent developments are built-out according to the Ewa DP. Design details for the drainage system for North South Road are different for the interim and ultimate watershed conditions. The primary difference between the interim and ultimate drainage plans for North-South Road is in the amount of flows being carried by the proposed drainage channel. Cross-drains are sized for ultimate build-out conditions to avoid reconstruction of the roadway pavement and disruption to traffic in the future. Under interim build-out conditions, these cross-drains will be used to convey existing sheet flows from the undeveloped areas west of the roadway to the drainage channel along the east side of the roadway.

For Kapolei Parkway, one drainage system design accommodates both interim and ultimate watershed conditions.

Additional description of the drainage features is provided in Chapter 2, including the phasing of system capacity. Discussion of impacts on water resources and drainage patterns is included in Section 3.8. This project's contribution to the regional drainage system is discussed in Section 3.14, Secondary and Cumulative Impacts.

**S.1.2 PURPOSE OF THIS DOCUMENT**

This FEA/FONSI has been prepared to comply with HRS Chapter 343 and the Hawaii Administrative Rules (HAR) (Title 11, Chapter 200, Environmental Impact Statement Rules (August 1996)). This FEA/FONSI also documents compliance with other federal laws and regulations because of the proposed use of federal funds administered by the FHWA to help build the project. Environmental review pursuant to NEPA has not yet been completed.

This document identifies and assesses the environmental and social impacts that could result from development of the North-South Road and federalization of Kapolei Parkway. Potential impacts of the preferred Build Alternative are contrasted with the impacts that would likely occur in the future without the project (the future No-Build condition). This No-Build Alternative includes regional roadway improvements listed in the latest revision of the Oahu Regional Transportation Plan (ORTP), also called the Transportation for Oahu Plan (TOP 2025), including the construction of Kapolei Parkway between the
TYPICAL SECTION
Kapolei Parkway
Looking East

NOT TO SCALE

Typical Section of Kapolei Parkway
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 5-3
proposed North-South Road and Renton Road. However, the No-Build Alternative excludes North-South Road and its interchange with the H-1 Freeway, even though this project is identified in the TOP 2025. Potential impacts are assessed for the Year 2025. Construction-phase impacts are also assessed in Section 3.14.

S.2 PURPOSE OF AND NEED FOR ACTION

The purpose of this project is to address various types of transportation needs including:

- to meet roadway capacity need for existing travel demand;
- to respond to regional land use and economic development trends;
- to meet future transportation demand; and
- to improve sub-regional mobility.

S.2.1 ROADWAY CAPACITY NEED FOR EXISTING TRAVEL DEMAND

Traffic volumes on Ewa’s arterial roadways reflect recent rapid urban development shown in Table S-1. From 1989 to 2001, growth in traffic volume on existing roadways ranged from 56 percent to 200 percent.

Table S-1: Traffic Volume Trends

<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Average Daily Traffic</th>
<th>Percent Increase</th>
<th>Percent Annual Increase</th>
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<tr>
<td></td>
<td></td>
<td>1989</td>
<td>2001</td>
<td></td>
</tr>
<tr>
<td>Fort Weaver Road</td>
<td>North of Farrington Highway</td>
<td>45,000</td>
<td>70,000</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>South of Farrington Highway</td>
<td>34,000</td>
<td>61,000</td>
<td>79%</td>
</tr>
<tr>
<td></td>
<td>At Honolulu Bridge</td>
<td>33,000</td>
<td>57,000</td>
<td>73%</td>
</tr>
<tr>
<td>Fort Barrette Road</td>
<td>South of H-1 Freeway</td>
<td>12,000</td>
<td>36,000</td>
<td>200%</td>
</tr>
<tr>
<td>H-1 Freeway</td>
<td>East of Kunia Interchange</td>
<td>74,000</td>
<td>140,000</td>
<td>89%</td>
</tr>
</tbody>
</table>

Source: HDOT, Traffic Count Data.

Fort Weaver Road repeatedly exceeds its capacity during both the A.M. and P.M. peak hours. In the A.M. peak period, approximately 85 percent of northbound (mauka-bound) vehicles on Fort Weaver Road access the eastbound H-1 Freeway via Kunia Interchange, regularly causing queues from the freeway to the Fort Weaver Road/Farrington Highway Interchange. In the P.M. peak period, the existing traffic volumes on Fort Weaver Road create queues at key intersections. While plans to widen Fort Weaver Road from four to six lanes in the next three years will help, it will be insufficient to accommodate planned future development in the Ewa area.
At Fort Barrette Road, traffic operations are congested during both the A.M. and P.M. peak hours. Particularly notable is the congestion at the Fort Barrette Road/Farrington Highway intersection, causing mauka-bound queues during the A.M. peak hour and eastbound queues during the P.M. peak hour.

The H-1 Freeway in the study area is affected by downstream congestion during the A.M. peak period. Recent improvements at the Kunia Interchange have mitigated P.M. peak period vehicle queues that used to back up on the westbound to makai-bound loop off-ramp and extend onto the freeway. Similarly, at the Makakilo Interchange in the westbound direction, P.M. peak period queuing on the westbound off-ramp that, at times, extended onto the freeway has been mitigated by recent improvements to the ramp.

These recent improvements address only the existing traffic demand. It is projected that future travel demand at the Kunia and Makakilo Interchanges will exceed capacity, adversely affecting conditions on the H-1 Freeway. Therefore, construction of new roadways and interchanges, as well as improvements to existing roadways and interchanges, is needed to address continuing regional urban development, as directed by current State and City policy and described in Section 1.2.1.

The proposed North-South Road would attract mauka-makai traffic, which would otherwise flow on Fort Weaver and Fort Barrette Roads. Diverting traffic to North-South Road would improve operating conditions on Fort Weaver and Fort Barrette Roads, allowing these other roadways to serve their travel markets better. Similarly, the North-South Road Interchange would relieve projected congested operations on H-1 Freeway at the Kunia and Makakilo Interchanges.

S.2.2 REGIONAL LAND USE AND ECONOMIC DEVELOPMENT TRENDS

The Ewa region, as defined by the Ewa Development Plan (Ewa DP), had a population of 68,718 in 2000, approximately 8 percent of Oahu's total population. In contrast, the estimated population of the Ewa DP area in 1990 was approximately 42,960 persons, 5.1 percent of the island total. In 2025, the estimated population of Oahu would be approximately 1.03 million. According to the City and County of Honolulu General Plan’s population guidelines, the Ewa DP area is intended to accommodate 13 percent of Oahu’s 2025 population, or roughly 133,874 persons – an increase of 95 percent from 2000 (U.S. Census, 2000, Ewa DP, Revised 2000; State of Hawaii Department of Business, Economic Development and Tourism, Population And Economic Projections, For The State Of Hawaii To 2025, 2000).

It is the objective of the State and City to create a "Second City" for Oahu in the Ewa area, by providing opportunities for residential and employment growth to supplement the Primary Urban Center (PUC). As shown in Figure S-4, the Ewa Plain would experience a substantial population, employment, and housing growth over the 25-year period between 2000 and 2025. By the year 2025, total population in the Ewa Plain would be over 116,000, up 68 percent from 2000, with a corresponding growth in
housing of 73 percent to over 38,000 units. Public and private developers have facilitated achievement of this objective, and a number of projects are completed, under construction, or planned, including several residential developments in Ewa, Kapolei, East Kapolei, Makakilo, and employment centers in areas such as the City of Kapolei, Campbell Industrial Park, East Kapolei, Ewa, and Ewa Beach.

Regional transportation improvements are needed to accommodate this anticipated growth in Ewa, and the North-South Road and Kapolei Parkway are components of the proposed regional improvements in the TOP 2025.

S.2.3 FUTURE TRANSPORTATION DEMAND

Many residents in the Ewa region travel to and from the PUC, with their primary route being the H-1 Freeway. In the base year 2000, there were approximately 150,000 daily production trips (trips originating from an area) and 114,000 daily attraction trips (trips ending in an area) in the Ewa region. Based on the City and County of Honolulu Department of Planning and Permitting's socio-economic forecasts, it was estimated that the region would generate approximately 802,800 daily production trips in the year 2025, an increase of 435 percent. The PUC is projected to receive approximately 60 percent of all attraction trips on Oahu in the year 2025. Socio-economic forecasts also indicate that approximately 646,900 attraction trips would be generated through employment growth in the Ewa region in 2025, an increase of 467 percent over 2000.

The TOP 2025 identified the need to increase access to the H-1 Freeway and transportation capacity in the North-South Road Corridor area. It also noted the need to establish transportation links between residences in Ewa and future employment centers in the City of Kapolei. Therefore, the TOP 2025 included the construction of North-South Road, a new interchange with H-1 Freeway, and the completion of Kapolei Parkway, among other future transportation improvements, such as widening Fort Barrette Road, Fort Weaver Road, and Farrington Highway.

Based on these transportation demand projections and the traffic volume trends described in Section 1.2, additional roadway and interchange capacity between existing and future residential communities and employment centers in the Ewa region and the H-1 Freeway is needed. Existing roadways and intersections connecting residential and employment areas with the H-1 Freeway are currently operating at or near their capacity and would not efficiently be able to accommodate the projected travel demand described above. Therefore, construction of North-South Road and Kapolei Parkway and a new interchange with the H-1 Freeway are needed to fully accommodate the policy-directed development in the Ewa Plain.

S.2.4 SUB-REGIONAL MOBILITY

Providing an alternative facility to Fort Weaver Road and Fort Barrette Road would reduce congestion on these roadways, improving transportation conditions for traffic in the Ewa Plain. Moreover, North-South Road and Kapolei Parkway would help improve
travel between activity centers within the Ewa Plain by providing alternative routes and improving overall system operation. Currently, travelers wanting to drive between points in Ewa have limited options, forcing mauka-makai roadways such as Fort Weaver Road and Fort Barretto Road to serve both mauka-makai demand and east-west demand. East-west connectivity is provided primarily by Farrington Highway and H-1 Freeway. Providing alternative roadway connections within the Ewa Plain would relieve both existing mauka-makai and east-west roadways, thereby providing better sub-regional mobility.

S.3 ALTERNATIVES

Project alternatives were identified through discussions with government agencies and input gathered at public meetings. Alignment, interchange, and roadway concept alternatives, including a Transportation System Management (TSM) alternative, were examined. These alternatives are described in Chapter 2. A preferred Build Alternative and a No-Build Alternative were selected for detailed examination in this FINAL ENVIRONMENTAL ASSESSMENT, and are described below.

The preferred Build Alternative assumes the construction of the North-South Road and the federalization of a segment of Kapolei Parkway between North-South Road and Renton Road. North-South Road would ultimately be a six-lane, divided highway between the H-1 Freeway and Kapolei Parkway, consistent with the Kapolei Area Long-Range Master Plan (July 1993) and the TOP 2025. In order to ensure that the key 0.7-mile section of the Kapolei Parkway between Renton Road and North-South Road is completed within the same time frame as the opening of North-South Road, this segment is proposed to be "federalized." The proposed segment of Kapolei Parkway would ultimately be a six-lane arterial roadway, connecting the proposed North-South Road to existing, southerly portions of the Kapolei Parkway.

North-South Road would intersect Kapolei Parkway between the existing Varona and Tenney Villages in the Ewa Villages development, adjacent to the bridge over Kaloi Gulch. The roadway would proceed north to the proposed interchange at the H-1 Freeway following existing roadway lots and easements up to Farrington Highway. In the case of State land, a roadway lot exists; in the case of private lands, there is an existing roadway easement. Between Farrington Highway and H-1 Freeway, the proposed North-South Road would follow the property line between State and private lands. The Build Alternative would also include a new conventional diamond configuration interchange with the H-1 Freeway, as well as intersections with the existing Farrington Highway and proposed intersections with other future roadways that would be constructed between Farrington Highway and Kapolei Parkway. The preferred Build Alternative would provide regional access to the interstate system as well as local access and circulation. The proposed road would include three lanes in each direction, a median, and sidewalks.

The total ROW required for the North-South Road and Kapolei Parkway Project is 189.44 acres. Of that amount, the North-South Road requires 133.32 acres, the North-South Road Interchange 46.35 acres, and Kapolei Parkway 9.77 acres. While the City owns the 9.77 acres for the Kapolei Parkway ROW, the State would have to obtain the land for

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the interchange and the North-South Road. A Governor’s Executive Order (E.O.) to transfer the land to HDOOT from the Department of Land and Natural Resources (DLNR) would be needed for 1.667 acres. Another 55.1 acres would be acquired from the Estate of James Campbell, and 7.9 acres would be acquired from the University of Hawaii.

At the interchange, more land would be acquired than would be required solely for the conventional diamond interchange. The additional acreage would be acquired to preserve the option of a westbound to southbound loop ramp in the future, when warranted by traffic volumes. While acquisition of the additional acreage is part of the preferred alternative assessed in this FEA/FONSI, the possible construction of a loop ramp is not addressed in this document. The loop ramp would be constructed as part of a future project, when warranted by future travel demand.

In comparison, the future No-Build Alternative assumes the roadway improvements in the TOP 2025, except the North-South Road Interchange and North-South Road, describing a future roadway network that includes some improvements for the Ewa Plain. Figure S-5 illustrates the 2025 No-Build Alternative roadway network. The No-Build Alternative assumes that Kapolei Parkway is complete from Ewa Beach through the City of Kapolei by year 2025, including the City’s segment between Renton Road and North-South Road, the City’s segment between the old Oahu Railway & Land Co. (OR&L) ROW and Renton Road, and other segments to be developed by third parties. However, that segment of Kapolei Parkway may not be in place within the late 2007 to early 2008 time frame, to match initial implementation of the proposed North-South Road. The inclusion of this segment of the Kapolei Parkway in the No-Build definition is consistent with City plans for the future completion of Kapolei Parkway, but reflects current City budgetary constraints that make the timing of this project completion uncertain. Because the City owns the property on which Kapolei Parkway is proposed, the roughly 10-acre ROW for the Kapolei Parkway is being established by subdividing the parcel and changing its designation, which is currently AG-1 (restricted agriculture).

The No-Build Alternative assumes a 794-bus fleet by 2025. This fleet includes the Regional Bus Rapid Transit (BRT) system proposed as part of the Primary Corridor Transportation Project, which is in the TOP 2025. However, because North-South Road and its interchange would not exist in the No-Build Alternative, the proposed North-South Road Park-and-Ride is also assumed not to exist. In turn, the Regional BRT and local hub-and-spoke bus routes that would otherwise interact with the proposed North-South Road Park-and-Ride would need to be rerouted to other transfer facilities. This assumption lowers the efficiency of transit service to the Ewa Plain area.

S.4 POTENTIAL IMPACTS AND MITIGATION

Table S-2 is a matrix comparing the environmental impacts of the No-Build and Build Alternatives. A summary of mitigation measures for each adverse impact is also provided. In general, the adverse impacts associated with both alternatives will be mitigated and will be minimal.
Table S-2: Summary of Environmental Impacts and Mitigation Measures

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<th>LAND USE</th>
<th>No-Build Alternative</th>
<th>Build Alternative</th>
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<tbody>
<tr>
<td><strong>Construction or Immediate Impacts.</strong> Construction of the City’s portion of Kapolei Parkway would convert roughly 10 acres of vacant land owned by the City and currently zoned for agriculture into a transportation facility. Other surrounding properties would also be converted to urban uses under this alternative.</td>
<td><strong>Construction or Immediate Impacts.</strong> In addition to the impacts of the No-Build Alternative, construction of North-South Road would convert roughly 190 acres of both active and inactive agricultural lands into a transportation facility. At least three diversified agriculture operations on relatively short-term leases with the Estate of James Campbell (EJC) and the State Department of Land and Natural Resources (DLNR) would lose some land from their fields due to right-of-way acquisition. These farms are Sugarland Farms, Inc., Aloun Farms, Inc., and A.M. Enterprise, Inc.</td>
<td></td>
</tr>
<tr>
<td><strong>Operational or Long-Term Impacts.</strong> The Ewa Plain was master planned in the Ewa DP and Kapolei Area Long Range Master Plan for urban development. Completion of Kapolei Parkway from the Villages of Kapolei to Ocean Pointe would improve general circulation in Ewa, which would support development of vacant open space areas surrounding this road. The vacant North-South Road corridor would not be converted to a highway.</td>
<td><strong>Operational or Long-Term Impacts.</strong> North-South Road is not anticipated to induce more development than what is currently considered and, therefore, would not intensify urban land uses planned for the Ewa Plain. It may accelerate planned development because of improved circulation notwithstanding budgetary and market conditions. Federalizing the portion of Kapolei Parkway would accelerate the timing for construction of the road, but otherwise, the roadway would be the same as under the No-Build Alternative.</td>
<td></td>
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<tr>
<td><strong>Mitigation.</strong> None required.</td>
<td><strong>Mitigation.</strong> The private landowner, EJC, will be compensated for right-of-way acquisition in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act. The DLNR property is being conveyed by a Governor’s Executive Order to HDOT. HDOT will coordinate with stakeholders to maintain access to parcels currently dependent on Paliwua Road.</td>
<td></td>
</tr>
</tbody>
</table>
Table S-2:
Summary of Environmental Impacts and Mitigation Measures
(continued)

<table>
<thead>
<tr>
<th>No-Build Alternative</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>GEOLOGY, SOILS, AND FARMLAND</strong></td>
<td></td>
</tr>
<tr>
<td>Construction or Immediate Impacts. The area affected by Kapolei Parkway and other development projects is classified as &quot;prime&quot; agricultural land. Planned roadway development projects would have little or no impact on existing farms. The area affected by Kapolei Parkway is not used for agriculture.</td>
<td>Construction or Immediate Impacts. The area affected by both Kapolei Parkway and North-South Road are classified as &quot;prime&quot; agricultural land. Only the construction of North-South Road would displace small portions of active farms, as described above.</td>
</tr>
<tr>
<td><strong>Operational or Long-Term Impacts</strong></td>
<td></td>
</tr>
<tr>
<td>The State of Hawaii, City, and private landowners are not planning to maintain agriculture in the Ewa Plain, except for spot locations, so in the long-run there would be no impacts on farmlands.</td>
<td>Operational or Long-Term Impacts. The area around North-South Road, as well as Kapolei Parkway, is not planned for long-term agricultural production. However, active farms on short-term leases in the area would continue to operate for the immediate future. Their access to their farmed lands and their irrigation lines would be maintained and/or replaced, as necessary. Per the Farmland Protection Policy Act, the Land Evaluation and Site Assessment score for the proposed action was calculated to be 149. Since this score is less than 160, alternatives that avoid farmland impacts do not need to be evaluated.</td>
</tr>
<tr>
<td><strong>Mitigation</strong></td>
<td></td>
</tr>
<tr>
<td>None required.</td>
<td>Mitigation. During the construction phase: Existing unlicensed agricultural vehicle crossings of North-South Road will be maintained during construction; Access between mauka and makai areas relative to the H-1 Freeway in the vicinity of Palehua Road will be maintained during construction, and unlicensed agricultural vehicles will be allowed to travel on Palehua Road; Irrigation lines within the project right-of-way will be maintained or relocated; Security will be provided during</td>
</tr>
<tr>
<td><strong>GEOLOGY, SOILS, AND FARMLAND (Cont'd)</strong></td>
<td><strong>INFRASTRUCTURE</strong></td>
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<td>--------------------------------------------</td>
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<tr>
<td><strong>No-Build Alternative</strong></td>
<td><strong>Build Alternative</strong></td>
</tr>
<tr>
<td>Mitigation (cont'd). See above.</td>
<td>Mitigation (cont'd). construction to prevent trespassing.</td>
</tr>
<tr>
<td></td>
<td>During the operational phase: Unlicensed agricultural vehicles will continue to be allowed to cross North-South Road and the H-1 Freeway with possible location and time restrictions. To minimize crop damage, farmers will be asked to harvest crops on affected lands before construction begins.</td>
</tr>
</tbody>
</table>

**Construction or Immediate Impacts.** Traffic flow impacts such as motorist delays, may occur near construction sites for planned roadway projects.

Construction of planned roadway projects may result in the displacement or relocation of some existing utilities.

**Operational or Long-Term Impacts.** Without the proposed North-South Road and its interchange, operating conditions on Fort Weaver and Fort Barrette Roads would continue to worsen. The severe traffic congestion projected at the Makakilo Interchange, the Kualoa Interchange, the Farrington Highway/Fort Barrette Road intersection, and key intersections along Fort Weaver Road would not be relieved.

**Construction or Immediate Impacts.** In addition to the impacts described under the No-Build Alternative, traffic flow impacts may occur at the ingress and egress for the North-South Road construction site, and where work is being conducted on Farrington Highway and on the Interstate H-1 Freeway.

Construction of North-South Road would result in the relocation of one 138 kV power pole at the intersection of Farrington Highway. Other impacts would be the same as the No-Build.

**Operational or Long-Term Impacts.** Heavy but acceptable traffic operations are projected throughout the study area. The construction of North-South Road and a new interchange on H-1 Freeway removes key Level-of-Service (LOS) F bottlenecks on Fort Barrette Road and Fort Weaver/Kualoa Road.

In addition to the ROW required under the No-Build Alternative, ROW for North-South
Table S-2:  
Summary of Environmental Impacts and Mitigation Measures  
(continued)

<table>
<thead>
<tr>
<th>No-Build Alternative</th>
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<tbody>
<tr>
<td><strong>INFRASTRUCTURE (Cont’d)</strong></td>
<td><strong>INFRASTRUCTURE (Cont’d)</strong></td>
</tr>
<tr>
<td>Operational or Long-Term Impacts. (cont’d). Right-of-way for the City segment of Kapolei Parkway would be used for future utilities. A parallel bike/pedestrian path, which tends to be popular with recreational or novice cyclists, would be developed as part of Kapolei Parkway. No other designated bike facility would be provided. Other bike facilities associated with planned roadway improvements would be constructed throughout the region.</td>
<td>Operational or Long-Term Impacts. (cont’d). Road would be used for future utilities. In addition to the bike path improvement in the No-Build Alternative, a bike path would be provided within the North-South Road ROW. HDOT will allow the Hawaiian Electric Company (HECO) to use this bike path to maintain their 138 kV power lines located within the North-South Road ROW.</td>
</tr>
<tr>
<td>Mitigation. It is assumed that construction-period mitigation measures will be implemented as a part of each project.</td>
<td>Mitigation. A maintenance of traffic plan will be prepared during the design phase to accommodate affected traffic flows during construction. The maintenance of traffic plan will include measures to minimize the impact of haul trucks removing material from the site. HDOT commits to coordination with HECO on the anticipated relocation of one 138 kV power pole.</td>
</tr>
<tr>
<td><strong>SOCIAL, CULTURAL, AND ECONOMIC ACTIVITIES</strong></td>
<td><strong>SOCIAL, CULTURAL, AND ECONOMIC ACTIVITIES</strong></td>
</tr>
<tr>
<td>Construction or Immediate Impacts. Construction employment would be provided for Kapolei Parkway and other planned roadway projects. But jobs would be created at a later date than under the Build Alternative and would be fewer in number because North-South Road would not need to be built.</td>
<td>Construction or Immediate Impacts. Construction employment would be provided by North-South Road. In addition to other projects.</td>
</tr>
<tr>
<td>Operational or Long-Term Impacts. Completion of Kapolei Parkway would strengthen economic and social ties between the Ewa Beach/Ocean Pointe/Ewa by Gentry area and the City and Villages of Kapolei, and would</td>
<td>Operational or Long-Term Impacts. Impacts would be similar to the No-Build Alternative. In addition, communities in the Ewa Plain would benefit from even greater social, economic, and public services support than under the No-Build Alternative.</td>
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Table S-2:
Summary of Environmental Impacts and Mitigation Measures
(continued)

<table>
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<tr>
<th>No-Build Alternative</th>
<th>Build Alternative</th>
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<tbody>
<tr>
<td><strong>SOCIAL, CULTURAL, AND ECONOMIC ACTIVITIES (Cont'd)</strong></td>
<td><strong>Operational or Long-Term Impacts. (cont'd).</strong> Alternative, because the North-South Road would provide an additional link to the H-1 Freeway. Similar to the No-Build Alternative, property values surrounding North-South Road would rise and no adverse impact is expected on City property tax revenues, even though lands used for roadway right-of-way would be removed from the tax base. Varona Village in Ewa Villages has a relatively high percentage of ethnic minorities. Additional outreach was conducted in this neighborhood to identify and address residents' concerns, pursuant to the Executive Order on Environmental Justice. However, no long-term disproportionately high, adverse human health, economic, or environmental effects were identified. Varona Village residents would have to cross a new intersection when traveling on Renton Road where none exists today. Varona Village residents would gain traffic benefits, such as better access to Kapolei, the H-1 Freeway and Ewa Beach. While the completion of the segment of Kapolei Parkway between North-South Road and the Villages of Kapolei would be conducted by another project, it is anticipated that Kapolei Parkway would not be opened for through traffic to Kapolei until North-South Road is completed.</td>
</tr>
<tr>
<td>Operational or Long-Term Impacts. (cont'd). enhance emergency response services throughout the region. The market value of land surrounding Kapolei Parkway would rise because of improved transportation services and existing development plans. A recent traffic study completed by HCDCH to identify pedestrian safety enhancements on Kapolei Parkway in the Villages of Kapolei included recommendations such as signalization of existing pedestrian crossings, proposed new signaled pedestrian crossings, and relocation of bus stops. These pedestrian improvements are being implemented by HCDCH, enabling Kapolei Parkway to accommodate the additional traffic while maintaining pedestrian safety.</td>
<td>Mitigation. When warranted by traffic conditions, traffic signals will be installed.</td>
</tr>
<tr>
<td>Mitigation. None required.</td>
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</table>

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Table S-2:  
Summary of Environmental Impacts and Mitigation Measures  
(continued)

<table>
<thead>
<tr>
<th>No-Build Alternative</th>
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<tbody>
<tr>
<td><strong>SOCIAL, CULTURAL, AND ECONOMIC ACTIVITIES (Cont'd)</strong></td>
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<tr>
<td>Mitigation (cont'd). See above.</td>
<td>Mitigation (cont'd). at Kapolei Parkway / Renton Road intersection.</td>
</tr>
<tr>
<td><strong>AIR QUALITY</strong></td>
<td></td>
</tr>
<tr>
<td>Construction or Immediate Impacts. Fugitive dust and mobile source emissions from construction equipment and vehicles would be generated during the construction of Kapolei Parkway and other planned roadway projects.</td>
<td>Construction or Immediate Impacts. Similar to the impacts described under the No-Build Alternative, construction of North-South Road would produce additional fugitive dust and mobile source emissions.</td>
</tr>
<tr>
<td>Operational or Long-Term Impacts. No violations of federal or State one- or eight-hour carbon monoxide standards are predicted. The microscale analysis for the proposed project demonstrates that no violations of the National or State Ambient Air Quality Standards are predicted.</td>
<td>Operational or Long-Term Impacts. No violations of the federal or State carbon monoxide standards are predicted. The project meets these goals and would not affect the State of Hawaii's current attainment status.</td>
</tr>
<tr>
<td>Mitigation. None required.</td>
<td>Mitigation. Dust control measures will be implemented during construction, such as minimizing land disturbance, using watering trucks and windbreaks, limiting vehicular paths, and stabilizing temporary roads. Following construction, any disturbed land not permanently in use will be re-vegetated.</td>
</tr>
<tr>
<td><strong>NOISE</strong></td>
<td></td>
</tr>
<tr>
<td>Construction or Immediate Impacts. All planned roadway projects would result in some noise from construction sites. High noise levels would be generated during construction of Kapolei Parkway. Activities near Renton Road may disturb Ewa Villages residences.</td>
<td>Construction or Immediate Impacts. In addition to the impacts described under the No-Build Alternative, construction of North-South Road would produce high noise levels, but the North-South Road corridor is located away from existing residences, and construction would occur mostly during daylight hours when loud noises are more tolerable. To minimize potential traffic disruption, night work is anticipated at the H-1 Freeway during the</td>
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### Table S-2:
Summary of Environmental Impacts and Mitigation Measures
(continued)

<table>
<thead>
<tr>
<th>No-Build Alternative</th>
<th>Build Alternative</th>
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<tbody>
<tr>
<td><strong>Noise (Cont'd)</strong></td>
<td><strong>Construction or Immediate Impacts, (cont'd). interchange construction.</strong></td>
</tr>
<tr>
<td><strong>Operational or Long-Term Impacts.</strong> Under the No-Build Alternative, predicted 2025 traffic noise levels at seven of the nine receptor sites analyzed are expected to be no different than their existing peak hour noise levels. Receptor sites near the H-1 Freeway and Farrington Highway are predicted to be higher than the noise abatement criteria (NAC) of Leq(h) 67 dBA under the No-Build Alternative, which is no different than current conditions. Noise impacts at receptor sites on or near existing and future sections of Kapolei Parkway are not expected.</td>
<td><strong>Operational or Long-Term Impacts.</strong> Under the Build Alternative, predicted 2025 traffic noise levels at those sites near the H-1 Freeway, Farrington Highway and on or near existing and future sections of Kapolei Parkway will be similar to conditions under the No-Build Alternative. Although traffic noise from North-South Road could contribute to ambient noise levels of the receptors near the H-1 Freeway and Farrington Highway, there are no immediate planned developments in these areas. Similarly, no noise receptors immediately adjacent to North-South Road were used because there are no immediate planned developments in these areas.</td>
</tr>
<tr>
<td><strong>Mitigation.</strong> None required.</td>
<td><strong>Mitigation.</strong> None required.</td>
</tr>
</tbody>
</table>
| **ECOSYSTEMS** | **Construction or Immediate Impacts.** Construction of Kapolei Parkway would clear vegetation consisting of mostly koa haole, buffel grass, swollen fingergrass, kiawe, and other common weedy plants. Other planned roadway projects would also most likely clear similar vegetation. Three Kooloaula, an endangered plant species, would be displaced by the Kapolei Parkway. | **Construction or Immediate Impacts.** Construction of North-South Road would clear vegetation similar to the No-Build Alternative, consisting almost exclusively of introduced or alien species. In addition to the three Kooloaula plants displaced by the Kapolei Parkway, another 21 individuals of the endangered species would be affected by the North-South Road construction. There may also be increased risk to remaining endangered plants from fire and automobile emissions. Because the construction of North-South Road and Kapolei Parkway are federally-funded under the Build Alternative, and the FHWA has determined that there
Table S-2: Summary of Environmental Impacts and Mitigation Measures (continued)

<table>
<thead>
<tr>
<th>No-Build Alternative</th>
<th>Build Alternative</th>
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<tbody>
<tr>
<td><strong>ECOSYSTEMS (Cont’d)</strong></td>
<td><strong>Construction or Immediate Impacts (cont’d).</strong> See above.</td>
</tr>
<tr>
<td><strong>Operational or Long-Term Impacts.</strong> No additional impacts to botanical and zoological resources anticipated.</td>
<td><strong>Operational or Long-Term Impacts.</strong> Increased risk to the endangered plants from fire and automobile emissions may not be limited to the construction period.</td>
</tr>
<tr>
<td><strong>Mitigation.</strong> A Habitat Conservation Plan (HCP) for Koolaula in Kapolei is already being implemented. In particular, a temporary 18-acre “Contingency Reserve Area” has been established prior to allowing the take of any plants, including the three plants in the Kapolei Parkway ROW. Otherwise, no construction-period mitigation measures are required because construction of Kapolei Parkway would be conducted by the City at a later time.</td>
<td><strong>Mitigation.</strong> Similar to the No-Build conditions, the HCP governing impacts on the Koolaula population will be implemented prior to allowing the take of the three plants in the Kapolei Parkway ROW and the additional 21 plants in the North-South Road ROW. In the unlikely event that other existing plants in the population do not survive fire, changes in air quality, or other unavoidable events, the genetic material of the population has been preserved by propagules of existing Koolaula individuals and are already managed at three off-site locations, per the provisions of the HCP. The construction contractor will be required to take fire prevention measures. A Section 7 Biological Opinion (BO) was rendered by the Service on August 5, 2004, documenting that the project with mitigation measures specified in the HCP will not jeopardize the affected endangered species. The completion of the BO completed the formal Section 7 consultation process.</td>
</tr>
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</table>
**Table S-2:**
**Summary of Environmental Impacts and Mitigation Measures**
(continued)

<table>
<thead>
<tr>
<th>No-Build Alternative</th>
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<tbody>
<tr>
<td><strong>WATER RESOURCES</strong></td>
<td></td>
</tr>
<tr>
<td>Construction or Immediate Impacts. The construction of Kapolei Parkway and other planned projects would expose soil, which could cause sediment loading of storm water during heavy rains.</td>
<td>Construction or Immediate Impacts. In addition to the impacts described under the No-Build Alternative, construction of North-South Road would expose soil at excavation sites, stockpiles and haul roads, which could cause sediment loading of storm water during heavy rains.</td>
</tr>
<tr>
<td>Operational or Long-Term Impacts. No impacts to water resources anticipated.</td>
<td>Operational or Long-Term Impacts. The mauka portion of North-South Road overlies the recharge area of the Southern Oahu Basal Aquifer (SOBA). Other roadways, such as the H-1 Freeway and Farrington Highway, and other urban land uses also overlie SOBA recharge areas. North-South Road would alter the local drainage pattern by interrupting sheet flow across the Ewa Plain. However, the project proposes to construct a portion of the regional drainage system. One result of the drainage system would be to collect and channelize the sheet flows. The project also includes bridges to allow passage of those flows in Kalai Gulch. A cross-drain system would also be provided to allow flows under the roadway berm. Excavation of a retention basin would accommodate the increase in flow that would be caused by the roadway’s impervious surface. Those components of the regional drainage system being provided by this project would be sized for the ultimate capacity needed for full build-out of the watershed. However, the capacity may be brought on-line in a phased manner. Even in the initial phase, the proposed drainage system for the North-South Road</td>
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</table>
### Table S-2:
Summary of Environmental Impacts and Mitigation Measures (continued)

<table>
<thead>
<tr>
<th>No-Build Alternative</th>
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<tr>
<td><strong>WATER RESOURCES (Cont’d)</strong></td>
<td><strong>Operational or Long-Term Impacts (cont’d).</strong> Operational or Long-Term Impacts (cont’d) will be able to convey flows in excess of the FEMA 100-year flood safely. System capacity will be increased commensurate with the pace of development in the watershed. There is no regulatory FEMA floodway within the project limits. A small portion of the project proposes excavation within the regulatory FEMA flood plain. Because the floodwater storage capacity of the floodplain would be increased, the function of the flood plain would not be adversely affected. Encroachment on the regulatory floodway will require filing of flood plain certifications with the City and County to ensure compliance with the City’s participation in the National Flood Insurance Program.</td>
</tr>
<tr>
<td><strong>Mitigation.</strong> No construction-period mitigation measures are required because construction of Kapolei Parkway would be conducted by the City at a later time.</td>
<td><strong>Mitigation.</strong> Storm water runoff and erosion during project construction will be mitigated through the use of Best Management Practices (BMPs) established before construction begins in coordination with the HDOH. As a precautionary measure to prevent roadway runoff from infiltrating into potable groundwater resources of the SOBA, the storm water system on the mauka section of North-South Road will convey roadway drainage to a discharge point approximately 1,500 feet south of Farrington Highway, away from the SOBA recharge area. Modification of the current regional drainage pattern (sheet flows and...</td>
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### Table S-2:
Summary of Environmental Impacts and Mitigation Measures  
(continued)

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<thead>
<tr>
<th>No-Build Alternative</th>
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<tbody>
<tr>
<td><strong>WATER RESOURCES (Cont’d)</strong></td>
<td>Mitigation (cont’d), intermittent streams must occur to enable the urbanization planned for the region. This project will contribute towards the modification of the regional drainage system. Insofar as this project will decrease flood risk through the provision of improved drainage infrastructure and capacity to handle drainage, the impacts will be beneficial and no mitigation of impacts to drainage patterns is required. An ACOE 404 permit will be required for the Kalo Gulch crossings. This permit, along with a Water Quality Certification from the State of Hawaii Department of Health, will contain specific mitigation measures for the stream crossings.</td>
</tr>
<tr>
<td>Mitigation (cont’d). See above.</td>
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</table>

| **SOLID WASTE AND HAZARDOUS MATERIALS** | |
| Construction or Immediate Impacts. It is unlikely that hazardous materials would be encountered during construction of Kapolei Parkway despite the existence of known hazardous materials sites associated with the Ewa Sugar Mill. These sites are located near the corridor but at sufficient distances from construction areas. | Construction or Immediate Impacts. Similar to the No-Build Alternative, it is unlikely that hazardous materials would be uncovered during construction of North-South Road. Construction activities would generate hazardous waste. The amount of project excavation may exceed the amount of fill material recycled for use on the project by approximately 500,000 cubic yards. |
| Operational or Long-Term Impacts. None are anticipated. The possibility always exists that vehicles carrying hazardous materials could be involved in an accident, which could release hazardous materials into the environment. Established incident response protocols are in place for such occurrences. | Operational or Long-Term Impacts. Same as the No-Build Alternative. |
Table S-2: Summary of Environmental Impacts and Mitigation Measures (continued)

<table>
<thead>
<tr>
<th>SOLID WASTE AND HAZARDOUS MATERIALS (Cont’d)</th>
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<tbody>
<tr>
<td><strong>No-Build Alternative</strong></td>
</tr>
<tr>
<td>Mitigation: None required.</td>
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<table>
<thead>
<tr>
<th>HISTORIC RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction or Immediate Impacts</strong> Due to past agricultural activities, it is highly unlikely that archaeological resources would be uncovered during construction of Kapolei Parkway and other planned roadway projects in the Ewa Plain.</td>
</tr>
<tr>
<td><strong>Construction or Immediate Impacts</strong> Similar to the No-Build Alternative, it is highly unlikely that archaeological resources would be uncovered during construction of North-South Road.</td>
</tr>
<tr>
<td><strong>Operational or Long-Term Impacts</strong> The Kapolei Parkway intersection with Renton Road would be within the Ewa Sugar Plantation Villages Historic District. Because the intersection is in a relatively isolated area of the district, and not within areas of the district where most of the contributing and individual historic buildings are located, it would not adversely affect the historic integrity of the district. However, the intersection would likely warrant traffic signals, which may not be consistent with the district’s historic characteristics.</td>
</tr>
<tr>
<td><strong>Operational or Long-Term Impacts</strong> Since construction of Kapolei Parkway is “federalized” under the Build Alternative, compliance with Section 106 of the National Historic Preservation Act (NHPA) is required. Because the intersection is in a relatively isolated area of the district, and not within areas of the district where most of the contributing and individual historic buildings are located, the FHWA rendered a “no adverse effect” determination. The State Historic Preservation Officer concurred with the “no adverse effect” determination, thereby completing the Section 106 process.</td>
</tr>
<tr>
<td>Mitigation: Pursuant to Section 6E-8 of the Hawaii Revised Statutes, the City will consult with the State Historic Preservation Division on the architectural design of the traffic signals at Kapolei Parkway and Renton Road.</td>
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Table S-2:
Summary of Environmental Impacts and Mitigation Measures
(continued)

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<th>No-Build Alternative</th>
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**HISTORIC RESOURCES (Cont'd)**

Mitigation (cont'd). See above.

Mitigation (cont’d), and Construction (DDC) will consult with the State Historic Preservation Division (SHPD) about potential measures to help maintain visual continuity along Renton Road.

**PARKS AND RECREATION**

Construction or Immediate Impacts. Right-of-way from any existing or planned park or recreational facility would not be required for Kapolei Parkway.

Construction or Immediate Impacts. Similar to the No-Build Alternative, right-of-way from any existing or planned park or recreational facility would not be required for North-South Road.

Operational or Long-Term Impacts. Kapolei Parkway would facilitate public access to parks and recreational facilities by improving regional mobility in Ewa.

Operational or Long-Term Impacts. North-South Road would facilitate public access to parks and recreational facilities to a greater extent than under the No-Build Alternative by providing access to the H-1 Freeway.

Mitigation. None required.

Mitigation. None required.

**VISUAL**

Construction or Immediate Impacts. None anticipated.

Construction or Immediate Impacts. None anticipated.

Operational or Long-Term Impacts. Kapolei Parkway would be designed as an urban "parkway", featuring ample landscaping and sidewalks. In the context of existing and planned urban development, Kapolei Parkway would not represent a visually obtrusive addition to Ewa’s aesthetic environment, including the historic context of Ewa Villages.

Operational or Long-Term Impacts. Similar to the No-Build Alternative. In addition, motorists on the North-South Road would have access to views of the Ewa Plain, the Waianae Mountain Range and the rising central Oahu plateau, which they otherwise may not have. Future land uses, however, would likely affect some of these views, depending on the location of future developments.

Mitigation. None required.

Mitigation. None required, other than landscaping, which is part of the proposed action.
<table>
<thead>
<tr>
<th>No-Build Alternative</th>
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<tbody>
<tr>
<td><strong>CUMULATIVE AND SECONDARY</strong></td>
<td><strong>CUMULATIVE AND SECONDARY</strong></td>
</tr>
<tr>
<td><strong>Potential Impacts.</strong> The Ewa Plain is anticipated for major development according to the Ewa DP, and proposed future development projects would occur regardless of which alternative is selected. Regional development and urbanization, including in the Ewa Sugar Plantation Villages Historic District; soil erosion from multiple construction projects; increased congestion of the transportation system corresponding to regional growth; some increased noise levels with regional development; eventual “take” of all endangered Koolaua plants from the East Kapolei area due to planned development; existing regional drainage issues would persist; urbanization of regional/neighborhood parks and viewplanes.</td>
<td><strong>Potential Impacts.</strong> Major development is anticipated in the Ewa Plain according to the Ewa DP, and proposed future development would occur regardless of which alternative is selected. Both Kapolei Parkway and North-South Road are part of this planned development. Therefore, potential impacts of the Build Alternative are the same as the No-Build Alternative, with the following changes: better roadway network, and therefore improved traffic conditions; increased traffic noise with regional development; North-South Road to improve regional drainage patterns by contributing to implementation of the regional drainage system; addition of a highway (North-South Road) in the regional viewplane. The Build Alternative will facilitate development of other planned projects, and project mitigation (e.g., noise, threatened and endangered species, drainage) has been designed to address impacts using a regional approach.</td>
</tr>
<tr>
<td><strong>Beneficial Impacts</strong> include increased utilities infrastructure regionally, and greater socio-economic ties between the Ewa and Kapolei communities.</td>
<td></td>
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<tr>
<td><strong>Mitigation.</strong> Increased traffic congestion and soil erosion would be addressed by other planned roadway projects and best management practices associated with those projects. Future developers would address noise impacts on currently undeveloped areas, as each new development is constructed. A Habitat Conservation Plan is being implemented to address the impact of regional development in East Kapolei. Existing regional drainage issues would be addressed by a regional drainage plan.</td>
<td><strong>Mitigation.</strong> All mitigation measures that would be implemented under the No-Build Alternative will also be implemented under the Build Alternative. In addition, those portions of the regional drainage system being provided by this project (e.g., regional drainage channel, culverts) will be sized to accommodate full build-out of the watershed. However, full capacity may be brought on-line in a phased manner based on the pace of development in the watershed. No mitigation is necessary for improved traffic conditions.</td>
</tr>
</tbody>
</table>
S.5 PROJECT SCHEDULE AND COSTS

The proposed project would be designed and built in phases. The interim phase would consist of only the North-South Road interchange ramps oriented to and from the east (westbound off ramp and eastbound on ramp), the east half of North-South Road from H-1 Freeway to Kapolei Parkway and the makai portion of Kapolei Parkway between Renton Road and North-South Road. A connection would be established between H-1, Farrington Highway, and Kapolei Parkway only when the interim phase is completed. The ultimate phase would implement the full build out of the North-South Road Interchange, North-South Road, and Kapolei Parkway. This phasing plan is described in more detail in Chapter 2 of this FEA/FONSI. In addition, the section of Kapolei Parkway west of the intersection of Kapolei Parkway and North South Road would not be opened until North South Road is opened from Kapolei Parkway to H-1.

The current schedule and costs are shown in Table S-3. Completion of approval processes is anticipated in late 2004. Construction of North-South Road between Farrington Highway and Kapolei Parkway would begin in early 2005, and construction of Kapolei Parkway would begin in 2006. The interim phases of both North-South Road and Kapolei Parkway would be open for service in late 2007 to early 2008. The ultimate phases would be completed and open for service between 2012 and 2015.

The estimated construction cost of the interim phase of North-South Road is $76 million, with the ultimate phase costing an additional $65 million. The estimated total cost for the entire North-South Road is $141 million. The interim phase would include the construction of three highway lanes and a half-diamond interchange; three more lanes and a full interchange would be provided in the ultimate phase. Based on availability of funding, the State would be responsible for 20 percent of project costs, and FHWA would pay for 80 percent. These estimates include the roadway, landscaping, drainage, electrical, traffic control, and environmental mitigation. Right-of-way acquisition would cost roughly $16 million, in addition to the total construction cost of $141 million.

The estimated construction cost of the interim phase of Kapolei Parkway between Renton Road and North-South Road is $12 million. The estimated cost for the ultimate Renton to North-South Road segment is $22 million. The cost share for Kapolei Parkway would be 80 percent federal funds and 20 percent City funds, based on availability of funding.
Table S-3: Proposed Project Construction Schedule and Costs

<table>
<thead>
<tr>
<th>Activity</th>
<th>Period</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North-South Road</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interim Phase</td>
<td>early 2005 to late 2007</td>
<td>$76 million</td>
</tr>
<tr>
<td>Ultimate Phase</td>
<td>post 2007</td>
<td>$65 million</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>$141 million</td>
</tr>
<tr>
<td><strong>Kapolei Parkway</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interim Phase</td>
<td>2006 to 2007</td>
<td>$12 million</td>
</tr>
<tr>
<td>Ultimate Phase</td>
<td>post 2007</td>
<td>$10 million</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>$22 million</td>
</tr>
</tbody>
</table>

CHAPTER 1

NORTH-SOUTH ROAD and KAPOLEI PARKWAY
FINAL ENVIRONMENTAL ASSESSMENT
CHAPTER 1
PURPOSE OF AND NEED FOR ACTION

1.1 PLANNING CONTEXT

The State of Hawaii Department of Transportation (HDOT) and City and County of Honolulu Department of Transportation Services (DTS) are issuing this Final Environmental Assessment / Finding of No Significant Impact (FEA/FONSI) for the North-South Road and Kapolei Parkway project (formerly North-South Road project) in Ewa, Oahu, Hawaii, pursuant to Chapter 343 of the Hawaii Revised Statutes (HRS). The project will affect tax map keys (TMKs): 9-1-016:108, 9-1-016:109, 9-1-017:004, 9-1-017:046, 9-1-017:068, 9-1-017:069, 9-1-017:071, 9-1-017:075, 9-1-018:004, 9-1-018:005, 9-2-002:001, 9-2-002:006, 9-1-017:86, 9-1-017:88, 9-1-16:129, 9-1-16:120, 9-1-16:127, 9-1-18:004, 9-1-18:007. Figure 1.1-1 shows the proposed project location and key elements.

North-South Road is a proposed federal-aid, limited-access, principal arterial highway, that would connect the Interstate Route H-1 (H-1 Freeway) to the proposed Kapolei Parkway, and is approximately 2.2 miles in length. The North-South Road project includes the construction of: (1) a major interchange at its junction with the H-1 Freeway; (2) the North-South Road/Kapolei Parkway intersection; and (3) various drainage features, such as a detention basin, associated with the proposed highway. The roadway section of concern for the Kapolei Parkway is from the proposed North-South Road to Renton Road, is approximately 0.7-mile in length, and is a proposed federal-aid, arterial roadway which would connect the proposed North-South Road to the other existing, southerly portions of Kapolei Parkway.

While the City and County of Honolulu (City) would otherwise complete the portion of Kapolei Parkway between North-South Road and Renton Road with local funds within roughly the next 20 years, the 0.7-mile section of Kapolei Parkway must be operational for North-South Road to function in accordance with its intended purpose. Consequently, in order to ensure that a major portion of the Kapolei Parkway is completed within a reasonable time period of the completion of the North-South Road, the 0.7-mile section of the Kapolei Parkway, from North-South Road to Renton Road, would be “federalized”, or federal funds would be made available for its construction.

1.1.1 PURPOSE OF THIS DOCUMENT

This FEA/FONSI has been prepared to comply with the HRS Chapter 343 and the Hawaii Administrative Rules (HAR) [Title 11, Chapter 200, Environmental Impact Statement Rules (August 1996)]. This FEA/FONSI also documents compliance with federal laws and regulations because of the proposed use of federal funds administered by the Federal Highway Administration (FHWA) for this project, which includes both the North-
South Road and the portion of Kapolei Parkway between Renton Road and North-South Road. Environmental review pursuant to the National Environmental Policy Act has not been completed.

In September 1998, HDOT, in collaboration with the FHWA, publicly released a joint HRS Chapter 343 and NEPA Draft Environmental Assessment (1998 Draft EA) for the North-South Road project, which extends from the H-1 Freeway to its future intersection with Kapolei Parkway. The 1998 Draft EA was written based on existing conditions and plans known at that time. It was understood at the time that third parties would implement the proposed portion of Kapolei Parkway in advance of the completion of North-South Road. Consequently North-South Road was envisioned as providing a connection between the H-1 Freeway and a functioning Kapolei Parkway.

A FEA/FONSI was not issued for the project in large part due to complications arising from the proposed take of an endangered plant species, the Koolauaia (Abutilon menziesii), as identified in the 1998 Draft EA. Difficulties in completing the State’s newly established Habitat Conservation Plan process (under HRS Chapter 195D) and federal consultation pursuant to the Endangered Species Act resulted in several years of delay. A HRS Chapter 343 FONSI was also not issued for the same reason.

Due to changes in existing conditions and the project definition since 1998, HDOT released a Revised Draft EA, which was noticed on July 23, 2004 in the Office of Environmental Quality Control’s publication, The Environmental Notice. The Revised Draft EA updated the impact assessment for North-South Road, and disclosed the inclusion of the portion of Kapolei Parkway from North-South Road to Renton Road. The document also replaced the 1998 Draft EA in accordance with State requirements. Following receipt and review of agency and public comments on the Revised Draft EA, HDOT rendered a decision that the proposed project will not result in a significant impact per criteria specified in HAR Section 11-200-12(b), and therefore, has issued this FEA/FONSI.

The purpose of this FEA/FONSI is to assess the environmental and social impacts that could result from construction of the North-South Road project and the federalization of the Kapolei Parkway project. Chapter 2 contains a project description and a discussion of alternative actions considered. Chapter 3 is a detailed discussion of the potential project impacts. The potential impacts of this combined action are assessed for the design year, 2025, and are compared against an assumed future “No-Build” condition. Construction-phase impacts are also assessed. Chapter 3 also provides proposed mitigation measures for adverse impacts. Coordination with interested and affected parties, including those required pursuant to State and federal laws, is documented in Chapter 4 and includes a formal governmental agency scoping meeting and informational presentations to local neighborhood boards.

**1.1.2 HISTORY AND CHANGES SINCE 1998 DRAFT EA**

In 1977, the City and County of Honolulu approved a General Plan that designated the Ewa region to be the site of a secondary urban center on Oahu, which includes the City of Kapolei, Ko Olina Phases I and II, the Kailua Barbers Point Harbor area, Kapolei...
Business Park, and Campbell Industrial Park. This “second city” objective was reconfirmed in the latest General Plan (1992). In the Ewa Development Plan (August 1997; amended May 2000), the City and County of Honolulu envisioned close to 39,000 housing units and over 67,000 jobs in the Ewa region by the Year 2020. The City and County of Honolulu has facilitated achievement of this objective through its residential developments in West Loch and Ewa Villages, and other actions.

The State of Hawaii also designated this area for future growth. The Housing and Community Development Corporation of Hawaii (HCDCH), formerly Housing Finance and Development Corporation (HFDC), is developing the Villages of Kapolei. The State is also planning a University of Hawaii West Oahu Campus in this area.

Private development has also occurred in the Ewa region, partly because of the area’s State and County designations as a secondary urban center. These developments include residences in Makakilo, the Villages of Kapolei, Ewa by Gentry, and Ocean Pointe (formerly Ewa Marina). Commercial, industrial, and resort developments in the City of Kapolei, Ko Olina, and Campbell Industrial Park are other examples of private development.

The State, City, and private developers have built the existing roadway infrastructure, in keeping with the network proposed in the Ewa DP. Crucial to the main network in the Ewa and Kapolei areas are the North-South Road and a complete Kapolei Parkway. Construction of these facilities would enable the Ewa area roadway network to provide the mobility as planned by creating a new connection between the Ewa and Kapolei areas, and an alternate access route to the H-1 Freeway from both communities.

The Oahu Metropolitan Planning Organization (OMPO) adopted the Transportation for Oahu Plan (TOP 2025) on April 6, 2001, replacing the previous Oahu Regional Transportation Plan (ORTP) adopted in November 1995. The TOP 2025 addresses Oahu’s changing traffic conditions, and presents the planned spending needed on transportation facilities and programs through the horizon year of 2025. TOP 2025 includes the North-South Road with a new interchange at the H-1 Freeway, and the completion of Kapolei Parkway.

The original Draft EA published in 1998 addressed only the North-South Road, with the assumption that other projects would be completed in advance of North-South Road. For example, prior to 1998 the HFDC (now the HCDCH), committed to completing Kapolei Parkway as a part of its East Kapolei Development, but HCDCH subsequently dropped its East Kapolei proposal and with it, its commitment to complete Kapolei Parkway.

For North-South Road to fulfill its function to provide alternative regional access to the H-1 Freeway for the Ewa area, Kapolei Parkway would need to be completed from Renton Road to North-South Road. Kapolei Parkway is currently completed between Launani Street and the Oahu Railway and Land Company (OR&L) right-of-way (ROW) and would soon be completed from OR&L right-of-way to Renton Road. The City plans to continue Kapolei Parkway from Renton Road to North-South Road, but budgetary constraints make the timing of this completion uncertain. To insure that the Renton Road to North-
South Road segment is connected to North-South Road within the same timeframe as the opening of North-South Road, the City and the HDOT elected to combine both projects into a single project for review purposes, which would allow the portion of Kapolei Parkway, from Renton Road to North-South Road, to be built using federal assistance, thereby addressing the budgetary constraints.

In addition, impacts to an endangered plant disclosed in the 1998 Draft EA had to be analyzed and mitigated further, pursuant to the State's endangered species law, HRS Chapter 195D. Because the law was new at the time, and regulations for implementing its requirement to prepare an endangered species' habitat conservation plan (HCP) were not fully developed, substantial time was required to allow the state legislature to correct gaps in the law. The legislature completed its revisions to the law during its 2003 session, thereby allowing the HCP to proceed, and the Board of Land and Natural Resources (BLNR) approved the Habitat Conservation Plan for Abutilon menziesii at Kapolei in March 2004.

Moreover, the design effort has advanced since 1998, changing the project definition. For example, the original North-South Road design acknowledged an HCDB proposal to redirect the existing Kāloī Gulch into a new channel that was to be located adjacent to and east of North-South Road. This rechannelization was part of East Kapolei actions to address regional drainage. When HCDB withdrew the East Kapolei Development, the timing of the regional drainage improvements became more long-range. This change means that North-South Road would precede instead of follow the regional drainage improvements. Therefore, design of North-South Road was changed to bridge the existing Kāloī Gulch. There is still a drainage channel and detention pond located adjacent to and east of the proposed North-South Road, but these will be designed to handle roadway drainage and effects of overland drainage affected by the roadway. These drainage elements are compatible with and would not preclude the ultimate regional drainage improvements that would be implemented with future development of the area.

Therefore, the actions evaluated in this FEA/FONSI are:

- the full construction of North-South Road, including roadway drainage features and the H-1 Freeway interchange; and
- federalization of the segment of Kapolei Parkway from North-South Road to Renton Road.

This FEA/FONSI assumes that the portion of Kapolei Parkway between Renton Road and North-South Road would otherwise be constructed with federal funds under the No-Build Alternative, but with several years of delay. Therefore, federalization of the Kapolei Parkway portion of the project would result in accelerating that roadway's construction. Note that this FEA/FONSI assumes the actual construction of Kapolei Parkway within Ewa Villages was originally evaluated pursuant to the State's environmental impact law (Chapter 343, HRS), as part of the Ewa Villages Master Plan Environmental Impact Statement (EIS) (February 1991). The proposed portion of Kapolei Parkway from North-South Road to Renton Road would connect with another segment of Kapolei Parkway from Renton Road to the CR&L right-of-way, which the City is planning to construct soon.
independent of federal funding. The City evaluated both portions of Kapolei Parkway for environmental impacts in the Ewa Villages Master Plan EIS.

A second iteration of formal scoping was not performed prior to the release of the Revised Draft EA. The basis of this decision is as follows. Distribution of the HRS Chapter 343 Revised Draft EA to those filing for consultative party status in 1998 provides an opportunity for these parties to rejoin the discussion by commenting on the document. Any formal pre-consultation processes that were previously conducted have been incorporated into the current process. Where those comments were still applicable, the Revised Draft EA and this FEA/FONSI have also incorporated the public comments on the 1998 Draft EA. In cases where the comments were no longer directly relevant because project conditions have changed, effort was made to incorporate the spirit or intent of the comment.

1.1.3 NAMING CONVENTIONS USED IN THIS DOCUMENT

Over the years, Kapolei Parkway has been called by several different names - a portion of North-South Road, East-West Road, as well as Kapolei Parkway. This FEA/FONSI refers to the subject roadway as Kapolei Parkway. The term Kapolei Parkway also refers only to that proposed City segment of the roadway between North-South Road and Renton Road, unless otherwise specified. Because the North-South Road encompasses the intersection with Kapolei Parkway, the western terminus of Kapolei Parkway is at the City/State property line where the intersection technically ends.

This document generally uses the standard directional terms north, south, east, and west. Because the proposed action is located in the Ewa District, this document avoids commonly-used local conventions based on place names, such as Ewa or Wai'anae (a generally westerly direction), Diamond Head or Koko Head (a generally easterly direction), and mauka/makai (towards the mountains/ocean, or north/south, with respect to project area). However, in some cases, these terms may be the most convenient to describe a direction or location, and this FEA/FONSI uses them as necessary.

1.2 PROJECT PURPOSE AND NEED

This project would address the following purposes and needs:

- meet roadway capacity need for existing travel demand;
- respond to regional land use and economic development trends;
- meet future transportation demand; and
- improve sub-regional mobility.
1.2.1 ROADWAY CAPACITY NEED FOR EXISTING TRAVEL DEMAND

Traffic volumes on the arterial roadways of Ewa reflect recent rapid urban development as described in Section 1.2.2 (see Table 1.2-1). From 1989 to 2001, growth in traffic volume on existing roadways ranged from 56 percent to 200 percent.

Fort Weaver Road repeatedly reaches near capacity conditions during both the AM and PM peak hours. In the AM peak period, approximately 85 percent of northbound vehicles on Fort Weaver Road access the eastbound H-1 Freeway via Kunia Interchange. Consequently, the Fort Weaver Road lanes that accesses the eastbound H-1 Freeway regularly queue to the Fort Weaver Road/Farrington Highway Interchange. Fort Weaver Road also processes very large traffic volumes in the southbound direction in the PM peak period. Fort Weaver Road is planned to be widened from its existing four-lane cross-section to a six-lane cross-section within the next three years. This widening would help the current situation on Fort Weaver Road, but would be insufficient to accommodate planned future development in the Ewa area.

At Fort Barrette Road, traffic operations are congested during both the AM and PM peak hours. Particularly notable is the congestion at the Fort Barrette Road/Farrington Highway intersection, causing mauka-bound queues during the AM peak hour and eastbound queues during the PM peak hour. This intersection is a key intersection that regulates access to and from H-1 Freeway from the area located makai of H-1 Freeway.

The H-1 Freeway in the study area is affected by downstream congestion during the existing AM peak period. This downstream congestion can create traffic queues that extend back to the Kunia Interchange. During the PM peak period, recent improvements at the Kunia Interchange have mitigated vehicle queues that used to back up on the westbound to makai-bound loop off-ramp that used to extend onto the freeway. Similarly, at the Makakilo Interchange in the westbound direction, PM peak period queuing on the westbound off-ramp that, at times, extended onto the freeway has been mitigated by recent improvements to the ramp.

Recent interchange improvements, while helpful, only address the existing traffic demand. It is projected that future travel demand at the Kunia and Makakilo Interchanges would exceed their capacity, adversely affecting conditions on the H-1 Freeway. Therefore, construction of new roadways and interchanges, as well as improvements to existing roadways and interchanges, is needed to address continuing regional urban development, as directed by current State and City policy and described in Section 1.2.2.

The proposed North-South Road in particular would attract mauka-makai traffic, which would otherwise flow on Fort Weaver and Fort Barrette Roads. Diverting traffic to North-South Road would improve operating conditions on Fort Weaver and Fort Barrette Roads, allowing these other roadways to serve their travel markets better. Similarly, the North-South Road Interchange would relieve projected congested operations on the freeway at the Kunia and Makakilo Interchanges, protecting the H-1 Freeway’s capacity to handle travel demand in this rapidly growing portion of the Ewa Plain.
Table 1.2-1:
Traffic Volume Trends

<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Average Daily Traffic</th>
<th>1969</th>
<th>2001</th>
<th>Percent Increase</th>
<th>Percent Annual Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Weaver Road</td>
<td>North of Farrington Highway</td>
<td>45,000</td>
<td>50,000</td>
<td>56%</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South of Farrington Highway</td>
<td>34,000</td>
<td>50,000</td>
<td>79%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At Honolulu Bridge</td>
<td>33,000</td>
<td>57,000</td>
<td>73%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Fort Barrette Road</td>
<td>South of H-1 Freeway</td>
<td>12,000</td>
<td>36,000</td>
<td>200%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>H-1 Freeway</td>
<td>East of Kunka Interchange</td>
<td>74,000</td>
<td>140,000</td>
<td>89%</td>
<td>5%</td>
<td></td>
</tr>
</tbody>
</table>

Source: HDOT, Traffic Count Data.

1.2.2 REGIONAL LAND USE AND ECONOMIC DEVELOPMENT TRENDS

The Ewa region, as defined by the Ewa Development Plan (DP), had a population of 68,718 in 2000 (as defined by the City and County of Honolulu designated Ewa DP Area), approximately 8 percent of Oahu's total population. In contrast, the estimated population of the Ewa DP Area in 1990 was approximately 42,960 persons, 5.1 percent of the Island total. In 2025, the estimated population of Oahu would be approximately 1.03 million. According to the City and County of Honolulu General Plan's population guidelines, the Ewa DP Area is intended to accommodate 12 percent of Oahu's 2025 population, or roughly 133,874 persons – an increase of 95 percent from 2000 (U.S. Census, 2000; Ewa Development Plan, Revised 2002; State of Hawaii Department of Business, Economic Development and Tourism, Population And Economic Projections, For The State Of Hawaii To 2025, 2000).

It is the objective of the State and City to create a “Second City” for Oahu in the Ewa area, by providing opportunities for residential and employment growth to supplement the Primary Urban Center (PUC). Public and private developers have facilitated achievement of this objective, and a number of projects are completed, under construction or planned. Existing residential areas near the North-South Road Corridor include Ewa Villages, Ewa by Gentry, and the Villages of Kapolei. Future developments near the corridor include the proposed University of Hawaii – West Oahu campus (UH-West Oahu), Department of Hawaiian Home Lands (DHHL) residences for native Hawaiians south of UH-West Oahu, and Ocean Pointe subdivision on the coast between Ewa Beach and the former Barbers Point Naval Air Station (BPNAS), now referred to as Kalaaeloa. Other unspecified but anticipated developments would occur in the vast tract east of the proposed North-South Road, and on City property surrounding the proposed Kapolei Parkway. DHHL has expressed interest in developing both areas and is currently in negotiations with the City and State to acquire these properties.
As shown in Table 1.2-2 and Figure 1.2-1, population, employment, and housing would all increase in the Ewa Plain over the 25-year period between 2000 and 2025. The largest population and housing growth is expected to occur in the Ewa Plain. By the year 2025, total population in the Ewa Plain would be over 116,000, up 66 percent from 2000, with a corresponding growth in housing of 73 percent to over 36,000 units. Most of the housing would be developed on the eastern and northern (makua) portions of the Ewa Plain.

In accordance with the "Second City" concept espoused by the City's Ewa DP, employment would also increase in the Ewa region, particularly in the City of Kapolei. Employment would be centered at the City of Kapolei and Campbell Industrial Park, as well as East Kapolei, Ewa, and Ewa Beach.

The East Kapolei component would be comprised of at least the UH-West Oahu campus, DHHL residential development, and other as yet unspecified urban developments. UH-West Oahu would be located on the west side of the North-South Road Corridor, makai of the Farrington Highway Intersection. Its plans are to provide residential, commercial, and mixed use properties, in addition to the campus itself. One transportation benefit of the proposed UH-West Oahu campus is that commuting students, faculty, and staff would create trips in the outbound direction, thereby helping to balance peak traffic flow on H-1 Freeway and more fully utilize the freeway. DHHL plans to develop an adjoining portion of East Kapolei south of the proposed campus, creating additional traffic demands associated with residential subdivisions. DHHL may also acquire other portions of East Kapolei for residential development. It is anticipated that DHHL would complete Kapolei Parkway between North-South Road and the current terminus of existing Kapolei Parkway in the Villages of Kapolei within the 2025 time frame. With Kapolei Parkway completed from Ewa Beach to Kapolei, the regional transportation network would be able to improve sub-regional mobility between these major activity centers.

Other developments in the Ewa Plain area include the City of Kapolei, the expansion of Makakilo including Makaiwa Hills, industrial development in Campbell Industrial Park, and Ko Olina located on the western coast of the Ewa Plain.

Kalaeloa is the name currently used for the former BPNAS. Existing uses on Kalaeloa include the Coast Guard C-130 base, Hawaii National Guard, Barbers Point Elementary School, Barbers Point Golf Course (military), public beach parks, a flying school, residential uses, and some miscellaneous light industrial uses.

The Ewa DP indicates future land uses at Kalaeloa to be mostly park, agricultural, low- to medium-density residential, public facility, and some light industrial; the OMPO ORTP (TOP 2025) indicates growth for BPNAS that is consistent with the Ewa DP. Potential alternative development plans have been proposed, but none have been officially adopted.

Regional transportation improvements are needed to accommodate this anticipated growth in Ewa. The North-South Road and Kapolei Parkway are just two components of the proposed regional improvements in the TOP 2025.
### Table 1.2-2:
Population and Employment Comparison
Year 2000 – Year 2025

<table>
<thead>
<tr>
<th>Area</th>
<th>Population</th>
<th>Change</th>
<th>Total Employment</th>
<th>Change</th>
<th>Housing Units</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makaiwa Hills</td>
<td>2,136</td>
<td>4,533</td>
<td>2,397</td>
<td>1</td>
<td>3,489</td>
<td>3,488</td>
</tr>
<tr>
<td>Ko Olina</td>
<td>2,450</td>
<td>8,701</td>
<td>6,251</td>
<td>305</td>
<td>3,311</td>
<td>3,006</td>
</tr>
<tr>
<td>Campbell Industrial Park</td>
<td>38</td>
<td>3,591</td>
<td>3,553</td>
<td>3,016</td>
<td>11,863</td>
<td>8,847</td>
</tr>
<tr>
<td>Mauka Campbell Lands</td>
<td>1,311</td>
<td>1,717</td>
<td>406</td>
<td>704</td>
<td>1,648</td>
<td>944</td>
</tr>
<tr>
<td>Makakilo</td>
<td>9,207</td>
<td>11,798</td>
<td>2,581</td>
<td>633</td>
<td>3,340</td>
<td>2,707</td>
</tr>
<tr>
<td>City of Kapolei</td>
<td>654</td>
<td>3,512</td>
<td>2,858</td>
<td>1,690</td>
<td>12,118</td>
<td>10,428</td>
</tr>
<tr>
<td>Kala'eloa</td>
<td>4,609</td>
<td>4,267</td>
<td>-342</td>
<td>4,493</td>
<td>4,767</td>
<td>274</td>
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<tr>
<td>Villages of Kapolei</td>
<td>3,301</td>
<td>6,712</td>
<td>3,411</td>
<td>53</td>
<td>2,756</td>
<td>2,703</td>
</tr>
<tr>
<td>East Kapolei</td>
<td>5,455</td>
<td>25,372</td>
<td>19,917</td>
<td>1,071</td>
<td>5,227</td>
<td>4,156</td>
</tr>
<tr>
<td>Ewa &amp; Ewa Beach</td>
<td>33,500</td>
<td>38,882</td>
<td>5,382</td>
<td>2,708</td>
<td>7,638</td>
<td>4,930</td>
</tr>
<tr>
<td>Puuolua – Iroquois Pt.</td>
<td>5,431</td>
<td>4,930</td>
<td>-501</td>
<td>224</td>
<td>477</td>
<td>253</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>70,092</strong></td>
<td><strong>116,030</strong></td>
<td><strong>45,913</strong></td>
<td><strong>16,898</strong></td>
<td><strong>58,659</strong></td>
<td><strong>41,736</strong></td>
</tr>
</tbody>
</table>

Source: Oahu Regional Transportation Plan (ORTP), Transportation for Oahu Plan TOP 2025, April 2001.
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 1.2-1

Source: Oahu Regional Transportation Plan (ORTP) Year 2025 Land Use, 2001.
1.2.3 FUTURE TRANSPORTATION DEMAND

In the base year 2000, there were approximately 150,000 daily production trips (trips originating from an area) and 114,000 daily attraction trips (trips ending in an area) in the Ewa region. Based on the City and County of Honolulu Department of Planning and Permitting's socio-economic forecasts, used in the OMPO ORTP, it was estimated that the region would generate approximately 802,800 daily production trips in the year 2025, an increase of 435 percent. The PUC is projected to receive approximately 60 percent of all attraction trips on Oahu in the year 2025. Therefore, many residents in the Ewa region would travel to and from the PUC with their primary route being the H-1 Freeway.

Socio-economic forecasts also indicate that approximately 646,900 attraction trips would be generated through employment growth in the Ewa region in 2025, an increase of 467 percent over 2000.

The TOP 2025, adopted by the OMPO on April 6, 2001, updates the ORTP adopted in November 1995, and presents the planned spending needed for transportation facilities and programs through the horizon year of 2025. TOP 2025 identifies the need to increase access to the H-1 Freeway and transportation capacity in the North-South Road Corridor area. It also noted the need to establish transportation links between residences in Ewa and future employment centers in the City of Kapolei. Therefore, it includes the construction of North-South Road, a new interchange with the H-1 Freeway, and the completion of Kapolei Parkway, as well as other future transportation network improvements described in Section 2.2, such as the widening of Fort Barrette Road, Fort Weaver Road, and Farrington Highway.

Based on these transportation demand projections and the traffic volume trends described in Section 1.2, additional roadway and interchange capacity between existing and future residential communities and employment centers in the Ewa region and the H-1 Freeway is needed.

Existing roadways and intersections connecting residential and employment areas with the H-1 Freeway are currently operating at or near their capacity (see Section 1.2.1) and would not efficiently be able to accommodate the projected travel demand described above. Improvements to these roadways would serve only part of the projected travel demand. Therefore, construction of North-South Road and the portion of Kapolei Parkway from Renton Road to North-South Road and a new interchange with the H-1 Freeway are needed to fully accommodate the policy-directed development in the Ewa Plain.

1.2.4 SUB-REGIONAL MOBILITY

Providing an alternative facility to Fort Weaver Road and Fort Barrette Road would reduce congestion on these roadways, allowing them to better handle traffic that remains within the Ewa Plain.
In addition, North-South Road and Kapolei Parkway would help improve travel between activity centers within the Ewa Plain by providing alternative routes, which provides system redundancy within the roadway network and improves overall system operation.

Currently, travelers wanting to drive between points in Ewa have limited options, forcing mauka-makai roadways such as Fort Weaver Road and Fort Barrette Road to serve both mauka-makai demand and east-west demand. East-west connectivity is provided primarily by Farrington Highway and H-1 Freeway. Because planned roadways such as Kapolei Parkway are not complete, sub-standard roadways such as Roosevelt Avenue (located within Kalaeloa) are being used to supplement east-west roadway capacity. Providing alternative roadway connections within the Ewa Plain would relieve both existing mauka-makai and east-west roadways thereby providing better sub-regional mobility.
CHAPTER 2
ALTERNATIVES

This chapter describes the alternatives developed and evaluated to address the project purposes and needs described in Chapter 1. Alternatives were developed in these areas:

- roadway alignment;
- roadway concept - the combination of roadway facilities and transportation modes that would be accommodated within the alignment; and
- interchange configuration.

By screening the alternatives (as summarized in this chapter), a set of alternatives was identified for detailed impact analysis in Chapter 3 of this FEA/FONSI. The alternatives carried forward are the No-Build and Preferred Build (Build) Alternatives.

2.1 ALTERNATIVES ADDRESSED IN DETAIL IN THIS FEA/FONSI

2.1.1 ASSUMPTIONS COMMON TO BOTH ALTERNATIVES

Both the No-Build and Build Alternatives are assumed to occur against the backdrop of a common future transportation system, as described in the TOP 2025 (April 2001). Using the TOP 2025 as the basis of all alternatives allows them to be analyzed within a consistent regional transportation framework that has been through an extensive public involvement process. The planning horizon used as the basis for future analyses in this FEA/FONSI is Year 2026, which is the time frame used for the TOP 2025.

Two sets of assumptions consistent with the TOP 2025 are inherent within all alternatives:

- roadway network assumptions; and
- travel demand management assumptions.

2.1.1.1 ROADWAY NETWORK ASSUMPTIONS

Future roadway improvement assumptions affect forecasts of travel patterns and traffic volumes. Except as noted, future (Year 2025) roadway improvements assumed are consistent with those included in the TOP 2025. Figure 2.1-1 illustrates the Year 2025 roadway facilities assumed within the City and County of Honolulu's Ewa Development Plan (Ewa DP) area. The following list and the Corridor Alternatives Report in Appendix B identify major roadway improvements assumed in the general vicinity of the project:
Kunia Road/Fort Weaver Road Corridor
- Widen Fort Weaver Road from 4 to 6 lanes between Farrington Highway and Geiger Road

Fort Barrette Road/Makakilo Drive Corridor
- Widen Fort Barrette Road from 2 to 4 lanes between Farrington Highway and F.D. Roosevelt Avenue
- Extend Makakilo Drive east to H-1 Freeway to provide second access point for Makakilo

Interstate H-1 - Interchange Improvements
- Makakilo Interchange – Construct new westbound on-ramp
- Kapolei Interchange – Construct new interchange between Makakilo and Palalai Interchanges
- Palalai Interchange – Improve existing interchange.

Farrington Highway Corridor
- Widen Farrington Highway from 2 to 4 lanes between Kapolei Golf Course Entrance and Fort Weaver Road
- Widen Farrington Highway from 2 to 4 lanes between Kamokila Boulevard and Kalaeloa Boulevard

Kapolei Parkway Corridor
- Complete various Kapolei Parkway segments between Kapolei and Ewa Beach

Other Roadway Improvements
- Construct new westbound Frontage Road between Makakilo Drive and Kalaeloa Boulevard

In addition to the improvements listed in the TOP 2025 (above), the following roadway improvements are also assumed:

- **Existing Paliolu Road** is assumed to remain for the No-Build Alternative. It is a 2-lane roadway that currently crosses under the H-1 Freeway in the vicinity of the proposed North-South Road Interchange. It is also assumed that, as part of the build-out of the Makakilo subdivision, this roadway will be extended to provide secondary access to Makakilo from the H-1 Freeway.

- **East-West Connector Road** would be a new east-west roadway that intersects Farrington Highway in the vicinity of the existing Kapolei Golf Course Entrance at its western terminus, and Fort Weaver Road opposite of Aawwa Drive at its eastern terminus (see Figure 2.1-1). Old Fort Weaver Road would be reconfigured to intersect the East-West Connector Road as a T-intersection. This roadway would provide access to future development in the East Kapolei area located between the “Villages of Kapolei” and Fort Weaver Road. This roadway would also provide sub-regional circulation for this area.

- **Traffic Signals** at the intersections of Kapolei Parkway and Renton Road, and Kapolei Parkway and North South Road, would be provided when warranted.
2.1.1.2 TRAVEL DEMAND MANAGEMENT ASSUMPTIONS

The TOP 2025 encourages and assumes the implementation of travel demand management (TDM) actions to reduce vehicular travel during peak traffic hours. Key TDM actions that are recommended in the TOP 2025 and assumed for all alternatives are:

- **Ridesharing** - The TOP 2025 recommends an integrated High Occupancy Vehicle (HOV) and park-and-ride system for the Ewa area. Incentive programs among private and public sector employees may also be implemented. An existing park-and-ride lot is located in Village Park, mauka of the Kualoa Interchange. Park-and-ride lots are also planned in the City of Kapolei and near the makai-east corner of the H-1 Freeway/North-South Road Interchange as part of the Regional Bus Rapid Transit (BRT) system.

- **Work Behavior Changes** - The TOP 2025 recommends incentive programs that encourage work behavior changes such as telecommuting, flexible work hours, and compressed work weeks.

- **Transportation Management Associations (TMAs)** - TMAs are organizations that operate within specific geographical areas to implement Transportation Demand Management (TDM) measures. Examples of TMA services include computerized carpool/vanpool matching, guaranteed ride home programs, subscription bus services, and so forth. Currently, the Leeward Oahu Transportation Management Association (LOTMA) serves the project area.

- **Alternative Transportation Modes** - The TOP 2025 incorporates the recommendations of Bike Plan Hawaii, A State of Hawaii Master Plan (April 1994, revised September 2003). In addition, the Kapolei Area Long Range Master Plan Map (July 1993, revised July 2003) proposes bikeways along many of the future streets in the Ewa/Kapolei area.

- **Parking Management Actions** - In order to discourage driving alone, the TOP 2025 recommends that employers discontinue parking subsidies and instead provide direct cash reimbursement for work-related parking expenses only. Another recommendation is to reduce the parking requirements in the City’s Land Use Ordinance. The intent is to encourage ridesharing or use of alternative travel modes by limiting on-site parking. The TOP 2025 also recommends a residential permit parking program to ensure that parking management does not result in employees parking on adjacent residential neighborhood streets.

In summary, these measures are designed to reduce travel demand during peak hours for all alternatives, and consequently, TDM will not be examined as a distinct project alternative.
2.1.2 PREFERRED BUILD ALTERNATIVE

The Build Alternative consists of:

- construction of North-South Road, and associated intersections and drainage features;
- federalization of Kapolei Parkway from North-South Road to Renton Road to coordinate its construction with North-South Road; and
- construction of a new interchange with the H-1 Freeway.

This section discusses the roadways. The interchange is discussed in Section 2.3.

2.1.2.1 DESCRIPTION

2.1.2.1a NORTH-SOUTH ROAD

As detailed in Appendix B, Corridor Alternatives Report (May 1998), three alignment alternatives were screened to determine the most appropriate alignment for North-South Road. Five roadway concepts were evaluated to resolve the type of roadway facility and modal accommodation to be provided within the alignment right-of-way (ROW). The Build Alternative described below presents the preferred alignment and roadway concept resulting from these evaluations.

The proposed 2.2-mile North-South Road would be a six-lane arterial roadway between the H-1 Freeway and future Kapolei Parkway. North-South Road would have a new interchange on the H-1 Freeway in the vicinity of the existing Palehua Road grade separation, and would intersect the future Kapolei Parkway between the existing Villages of Kapolei and Ewa Villages developments. Major intersections are proposed at Kapolei Parkway, a future east-west road, a potential UH-West Oahu access, and Farrington Highway. All major intersections will have exclusive left-turn lanes within the median. Right turns would be allowed from the outside lanes of the ultimate six-lane roadway. When warranted, all major intersections would be signalized. North-South Road would be constructed to State of Hawaii standards.

The preferred alignment would follow the Palehua Corridor similar to the existing Palehua Road, as illustrated in Figure 2.1-2. This North-South Road alignment alternative has been shown on many development plans. The Kapolei Long-Range Master Plan (July 2003), planning documents for the University of Hawaii West Oahu Campus (UH-West Oahu), and the Ewa Development Plan (Ewa DP) (August 1997, and amended on May 2000) consistently show this conceptual alignment for this proposed highway. The TOP 2025, while not specific with regard to alignment, also indicates a North-South Road, as well as a completed Kapolei Parkway, within this area.

This alignment would provide increased traffic circulation and access to the regional transportation system. It would provide alternative access to the H-1 Freeway, lessening the intensity of existing and projected traffic congestion at the Kunia and Makakilo...
Interchanges. Unlike other North-South Road alignment alternatives (see Section 2.2), it would have no direct community impacts. It would require the least amount of right-of-way (ROW) acquisition of all alignments considered, and it would be consistent with existing and future development plans. The North-South Road, originally called the Pahoa Corridor, was assessed as being the least expensive alignment alternative (see Table 2.2-1) since it could be constructed on relatively flat topography with no major physical constraints. The Pahoa Corridor was, therefore, selected as the preferred alignment for North-South Road.

The alignment would be within a proposed 300-foot ROW. The proposed typical cross-section of North-South Road is shown in Figure 2.1-3. North-South Road is proposed to be a divided roadway with the mauka-bound and makai-bound roadbeds separated by a 28-foot wide raised median. At intersections where double-left turns are anticipated, the median would be 6 feet wide.

Each roadbed would be 48-feet wide from face of curb to face of curb, allowing an inside 2-foot shoulder, three 12-foot lanes, and a 10-foot outside shoulder. There would be 8-foot sidewalks on both sides of North-South Road. A drainage system, as described in Section 2.1.2.1c, is also part of the proposed project. East of the 138 kilovolt (kV) transmission towers would be a variable width area that would contain a two-way paved bike path, highway embankment slope, and a channel for regional and roadway-related drainage.

An exclusive rapid transit corridor would be reserved within the 28-foot median of North-South Road. This future transit corridor would begin at H-1 Freeway and proceed makai to Kapolei Parkway. At Kapolei Parkway, the transit corridor would connect to the existing east-west rapid transit corridor within the median of Kapolei Parkway. At selected locations along North-South Road, there may be the need for future widening of the median to provide for transit stops.

The North-South Road portion of the project also includes establishment of landscaping. Details of the landscaping will be developed in the project’s design phase. Cultivated Kooaloa, the endangered species found in the roadway right-of-way, will be studied for inclusion in the project’s landscaping, and will be included if reasonable. The use of plants that minimize water requirements will also be a goal of the landscaping plan.

2.1.2.1b KAPOLEI PARKWAY

The Build Alternative includes the “federalization” of Kapolei Parkway between Renton Road and North-South Road, meaning that this segment would be built using federal assistance. To ensure that this segment is connected to North-South Road within the same time frame as the opening of North-South Road, the City and the HDOT recently elected to combine the two facilities into one EA document and request federal funds for the portion of Kapolei Parkway between North-South Road and Renton Road, thereby addressing the City’s budgetary constraints and expediting construction of both projects.
TYPICAL SECTION
North-South Road - Looking North

TYPICAL SECTION
North-South Road ROW Corridor - Looking North

NOT TO SCALE

Typical Section of North-South Road
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 2.1.3
The federalized portion of Kapolei Parkway addressed by this FEA/FONSI would connect North-South Road to Renton Road, as shown in Figure 2.1-1. This segment is approximately 0.7 mile long and would also connect to the segment of Kapolei Parkway located between Renton Road and the OR&L ROW, which is planned for construction by the City soon. The segment under construction, in turn, provides connectivity to an existing segment of Kapolei Parkway located between the OR&L ROW and a point approximately 750 feet south of Geiger Road. This FEA/FONSI assumes that the segments of Kapolei Parkway soon to be constructed and proposed for future construction were evaluated by the City for environmental impacts in the Ewa Villages Master Plan EIS (February 1991). Construction of the Renton Road intersection will be undertaken by the City project for Kapolei Parkway, from the OR&L ROW to Renton Road.

The proposed portion of Kapolei Parkway, from Renton Road to North-South Road, would be contained within a 116-foot ROW that has already been set aside for a major roadway through prior sub-regional planning efforts in the Ewa Plain. The proposed portion of Kapolei Parkway would be configured as a divided, six-lane, arterial roadway with a raised median and at-grade intersections. Left-turn lanes would be provided in the median at intersections. In its ultimate configuration, right turns would be allowed from the outside lanes of Kapolei Parkway with the exception of the westbound approach at the North-South Road/Kapolei Parkway intersection. At this intersection, an additional right-turn lane would be provided for the westbound to mauka-bound right-turn movement. As in the No-Build, traffic signals would be installed at the intersections of Kapolei Parkway and North-South Road, and Kapolei Parkway and Renton Road, when warranted. The Kapolei Parkway segment from Renton Road to North-South Road would be constructed to be consistent with State of Hawaii Department of Transportation standards. The proposed typical cross-section for the proposed portion of Kapolei Parkway is shown in Figure 2.1-4.

The proposed project also includes the implementation of environmental mitigation measures. As described in more detail in Chapter 3, the inclusion of environmental mitigation would result in a project with minimal adverse environmental and social impacts. One major environmental mitigation measure included in the proposed project is the implementation of a Habitat Conservation Plan (HCP) for an endangered plant. The HCP stipulates propagation of existing individuals of an endangered plant species (Koolaula, or Abutilon menziesii), located in the proposed roadway ROW; establishment of at least three off-site outplanting sites for the plants and creation of an 18-acre temporary Contingency Reserve Area where plants can be kept in their natural habitat until off-site planting sites achieve pre-determined success criteria. Additional details about the HCP are provided in Section 3.7.

2.1.2.1c DRAINAGE SYSTEM

In addition to drainage systems designed to handle roadway runoff, the North-South Road and Kapolei Parkway project will provide a portion of the regional drainage system that will support the long-range drainage plan and urban development of Ewa. The proposed project includes a drainage system consisting of the following elements (see Appendix J for more details):
TYPICAL SECTION
Kapolei Parkway
Looking East

NOT TO SCALE

Typical Section of Kapolei Parkway
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 2.1-4
a. Roadside Drainage Facilities

Roadside drainage systems will serve to capture runoff from the roadway and will consist of a series of catch basins connected by pipe culverts.

b. Interchange and Roadway Portions overlying the SOBA Recharge Area

Roadway runoff from portions that lie above the Southern Oahu Basal Aquifer (SOBA) recharge line will be captured and piped down to a point downstream of the recharge line (approximately 1,500 feet south of Farrington Highway), so as to avoid contaminating the aquifer. The SOBA is discussed in Section 3.8.1.1.

c. Roadway Portions not overlying the SOBA Recharge Area

Roadway runoff from the roadway portions that do not overlie the SOBA recharge line will be collected and piped to the regional drainage channel (described below), with the exception of runoff from the lower portion of North-South Road (below the drainage basin, described below) will be piped into the Ewa Villages Golf Course for disposal into the Kaloi Gulch system.

d. Interim Interceptor Ditches

During the interim period, when areas adjacent to the roadway are undeveloped, sheetflows from these undeveloped off-site areas along the roadway segment will be intercepted by a series of temporary ditches and piped across the roadway through cross-drains for discharge into the drainage channel. All ditches and inlets will be located within the proposed road right-of-way.

e. Regional Drainage Channel

The drainage plan for North-South Road calls for the implementation of a portion of the regional drainage channel and storage basin to handle runoff. The channel will receive roadway runoff, as well as capture overflows from the Kaloi Gulch channel at its upper crossing of North-South Road (approximately 900 feet south of Farrington Highway). The channel will be located along the east side of the roadway and will be designed to convey ultimate watershed flows in accordance with City drainage standards.

f. Drainage Retention / Detention Basin

A drainage retention / detention basin is proposed at the downstream end of the regional drainage channel to handle runoff increases from the North-South Road project. It may also be used in the future to help reduce sediment transport from developments that occur in the watershed.

g. Interface at Ewa Villages Golf Course

The drainage basin will discharge into the Ewa Villages Golf Course. The existing box culvert at the Kaloi Gulch channel inlet into Ewa Villages will be enlarged to accommodate a flow of 2,500 cfs in accordance with the Interim Drainage Plan for North-South Road. Some minor improvements will be required within the Ewa Villages Golf Course to accommodate the added culvert structure.
h. Drainage Channel Bridge Crossings
   Two future collector roadway connections are anticipated to occur along North-South Road. In order to maintain access to adjacent lands over the regional drainage channel, bridges at these future roadways are proposed as part of the project. Each of these roadways is assumed to have a right-of-way width of 150 feet.

i. Kaloi Gulch Bridge / Culvert Crossings
   The North-South Road crosses Kaloi Gulch at two locations between Farrington Highway and Kapolei Parkway. The upper crossing occurs approximately 900 feet south of Farrington Highway. The lower crossing occurs approximately 500 feet north of Ewa Villages. At each crossing, 40-foot, single-span bridges will be used to carry the roadway over the Kaloi Gulch channel.

j. Kaloi Gulch Culvert Modification at H-1
   The existing double box culverts at the Kaloi Gulch crossing of the H-1 Freeway will need to be lengthened at the inlet and outlet to accommodate freeway widening involved with the two eastern interchange ramps (westbound off-ramp and eastbound on-ramp).

k. Cross-Drains for Future Developments
   Major cross-drains will be installed across North-South Road to accommodate runoff into the regional drainage channel from future developments situated to the west of the roadway. The sizes and locations of these culverts are generally as specified in the East Kapolei Drainage Master Plan. Cross-drains were designed to be relatively deep in order to provide sufficient clearance for future utilities that are planned within the utility corridor area next to the roadway.

The drainage system considers two watershed build-out conditions: interim and ultimate. Interim watershed conditions assume that adjacent areas in East Kapolei are in their current condition. Ultimate watershed conditions assume that adjacent developments in East Kapolei are built. The drainage system will be designed for both interim and ultimate flows. The primary difference between the interim and ultimate drainage plans for North-South Road is in the amount of flows being carried by the proposed drainage channel. Cross-drains are sized for ultimate build-out conditions to avoid reconstruction of the roadway pavement and disruption to traffic in the future. Under interim build-out conditions, these cross-drains will be used to convey existing sheet flows from the undeveloped areas west of the roadway to the drainage channel along the east side of the roadway.

The Kapolei Parkway drainage system will also be designed for both interim and ultimate watershed conditions.

Appendix J contains a Technical Memorandum describing the drainage systems for North South Road and Kapolei Parkway. Graphics showing the drainage plans are provided in Appendix J.
The North-South Road portion of the project includes construction of a drainage collection system around the proposed H-1 Freeway Interchange and along the segment of the roadway that lies above the infiltration area of the Southern Oahu Basal Aquifer, a designated sole-source aquifer (item (e) above). The discharge point of the drainage collection system would be located seaward of the potentially sensitive aquifer recharge area (see Section 3.8 for additional information). In addition to the collection system, a drainage basin is also proposed to handle drainage needs associated with the roadway, as shown in Figure 1.1-1 (item (f) above).

There are two possible scenarios for construction of the regional drainage channel (item (e) above) depending on availability of local funding. The first scenario entails phased construction of the channel. An interim channel, capable of conveying 2,500 cfs, would be established initially. This interim channel could be constructed either by excavating a channel with the cross-sectional area, or by excavating a channel to the ultimate cross-sectional area, and installing flow constraints, such as reduced width sections, berms and/or culverts at roadway crossings, in the channel to restrict the flow to 2,500 cfs. The restriction of the initial flow to 2,500 cfs is based on an agreement among stakeholders within the watershed.

The ultimate channel would be 60 feet wide at the bottom and capable of conveying 6,000 cfs at Farrington Highway to 7,400 cfs at the top of Ewa Villages. The 60 feet wide channel would be provided either by additional excavation to widen the interim channel, or by removing the limiters placed in the channel which was initially excavated to ultimate width.

Should local funding be made available, the ultimate phase of the drainage channel could be provided during initial construction.

Both phases (interim and ultimate), and both options for implementing the phases (phased development or construction of ultimate condition initially), are being disclosed and assessed at this time to clear environmental review.

If the initial phase of the drainage channel is constructed, the North South Road profile would rise over Kaloi Gulch at two points. Should the ultimate phase be constructed initially, the roadway profile would not need to rise over Kaloi Gulch.

The project does not propose to change the gulch alignment. As disclosed in the 1998 Draft EA, the Housing and Community Development Corporation of Hawaii (HCDCH; formerly Housing Finance and Development Corporation, or HFDC) had planned to realign the Kaloi Gulch channel as part of its East Kapolei Master Plan development project. At the time of the 1998 Draft EA, HCDCH planned to have the regional drainage improvements in place prior to the construction of North-South Road. However, the HCDCH has since withdrawn its development plans in the area. A re-alignment of Kaloi Gulch is still under consideration and may occur in the future, but would be implemented by undetermined third parties. State of Hawaii Department of Transportation's (HDOT) North-South Road project will now precede these improvements. Because a future regional drainage project may require the flow from the nearby Hunehune Gulch to be re-directed to the re-aligned Kaloi Gulch in the future, project engineering for North-
South Road has considered this possibility and would not preclude future options for such potential regional drainage improvements.

2.1.2.2 RIGHT-OF-WAY REQUIREMENTS

Figure 2.1-5 illustrates land ownership along the preferred alignment. The North-South Road roadway would be roughly 140 feet wide, within a proposed 300-foot ROW currently being acquired by the HDOT. The proposed portion of Kapolei Parkway would fit within a 116-foot roadway width. See Figures 2.1-3 and 2.1-4.

The total ROW required for the North-South Road and Kapolei Parkway project is 189.44 acres. Of that amount, the North-South Road requires 133.32 acres, the North-South Road Interchange requires 46.35 acres, and the proposed portion of Kapolei Parkway from Renton Road to North-South Road requires 9.77 acres.

The amount of the ROW for the North-South Road and the North-South Road Interchange that would be obtained through an Executive Order (EO) is roughly 116.67 acres. That area is currently owned by the State of Hawaii and administered by the State of Hawaii Department of Land and Natural Resources (DLNR). Also, 7.9 acres in the north-east quadrant of the North-South Road Interchange would be acquired from the UH-West Oahu.

The mauka segment of North-South Road between H-1 Freeway and the northern boundary of the State-owned land traverses land owned by the Estate of James Campbell (EJC) (see Figure 2.1-5). The roadway ROW to be acquired from the EJC would be acquired in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The total acreage to be acquired from the EJC would be approximately 55.1 acres, including roadway and interchange footprints.

The proposed portion of Kapolei Parkway passes through land presently owned by the City and County of Honolulu (City). Land ownership will remain with the City and 9.77 acres would be designated to change to roadway ROW.

Of the total area to be acquired, the interchange with H-1 would require approximately 46.35 acres. This includes acquisition of additional land in the northwest quadrant of the interchange for a future loop ramp for the westbound to southbound movement to accommodate growing travel demands in the Ewa Plain.

2.1.2.3 PROJECT SCHEDULE, COSTS, AND PHASING

The proposed project would be designed and built in phases. The interim phase consists of only the North-South Road interchange ramps oriented to and from the east (westbound off ramp and eastbound on ramp), the east half of North-South Road from H-1 Freeway to Kapolei Parkway and the makai portion of Kapolei Parkway between Renton Road and North-South Road. The ultimate phase would implement the full build
out of the North-South Road Interchange, North-South Road, and the proposed portion of Kapolei Parkway. More specifically:

North-South Road:

- **Interim Phase (Early 2005 to late 2007):** Mass grading for six lanes and drainage improvements; construction of the north-bound half of the highway from Kapolei Parkway to H-1 Freeway and striped for two lanes in each direction; construction of interim intersections at Kapolei Parkway and Farrington Highway; construction of half diamond interchange at H-1 Freeway, construction of roadway drainage and retention / detention basin, and HCP mitigation measures.

- **Ultimate Phase (construction project to be implemented anytime between the years 2007 to 2025):** Construction of the south-bound half of the highway and restriping to three lanes in each direction; ultimate intersection configurations at Kapolei Parkway and Farrington Highway; and ultimate interchange configuration at H-1 Freeway.

Kapolei Parkway construction, from Renton Road to North-South Road:

- **Interim Phase (2006 to 2007):** Mass grading for six lanes and drainage improvements; construction of three makai travel lanes from North-South Road to Renton Road. Includes roadway and drainage grading, construction of a portion of underground utilities, storm drainage system, street lighting system, and landscaped median.

- **Ultimate Phase (construction project to be implemented anytime between the years 2007 to 2025):** Construction of additional three mauka lanes, the construction of which to be coordinated with completion of North-South Road. Includes construction of remaining underground utilities, storm drainage system, street lighting system, and landscape irrigation system.

The current schedule is shown in Table 2.1-1. Completion of the approval processes is anticipated by Fall 2004, and construction of the interim phase of North-South Road and associated interchange would begin in early 2005; construction of the proposed portion of Kapolei Parkway from Renton Road to North-South Road would begin in 2006.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interim Phase: North-South Road, Interchange, and Kapolei Parkway Construction</td>
<td>Early 2005 - Late 2007 (Open for Service Late 2007)</td>
</tr>
<tr>
<td>Ultimate Phases: North-South Road, Interchange, and Kapolei Parkway incrementally upgraded to Ultimate Configuration</td>
<td>Late 2007 - 2025</td>
</tr>
</tbody>
</table>
Two conditions pertaining to roadway openings have been established, as follows:

- The interim phase of North South Road will be opened only after connectivity between H-1, Farrington Highway, and Kapolei Parkway has been established; and
- The section of Kapolei Parkway west of the intersection of Kapolei Parkway and North South Road will not be opened until North South Road is opened from Kapolei Parkway to H-1.

The total estimated cost of the ultimate North-South Road from H-1 Freeway to Kapolei Parkway is $141 million in 2004 dollars. Of this total, the estimated cost of the interim phase is $76 million, with the ultimate phase costing an additional $65 million in 2004 dollars. These estimates include the roadway, landscaping, drainage, electrical, traffic control and environmental mitigation costs. Right-of-way acquisition would cost roughly $16 million, in addition to the total construction cost of $141 million. Based on availability of funding, the State will be responsible for the 20 percent of the costs, and FHWA will provide funding for 80 percent.

The segment of Kapolei Parkway between Renton Road and North-South Road is estimated to cost $22 million. The interim phase of the proposed portion of Kapolei Parkway would cost an estimated $12 million. The City will pay 20 percent of costs, and FHWA will provide 80 percent. Although this project is currently not listed on the Hawaii Statewide Transportation Improvement Program (STIP) for fiscal years 2004 through 2006, the STIP will be amended to include this project.

### 2.1.3 NO-BUILD ALTERNATIVE

The No-Build Alternative describes a future roadway network that includes improvements for the Ewa Plain area described in Section 2.1.1 without North-South Road Interchange and North-South Road between H-1 Freeway and Kapolei Parkway. Kapolei Parkway, from Ewa Beach through the City of Kapolei, is assumed to be complete by various private and public developers by year 2025, including the segment between Renton Road and North-South Road. The inclusion of the Renton Road to North-South Road segment of Kapolei Parkway in the No-Build Alternative is consistent with plans for the future completion of Kapolei Parkway. The commitment and need to implement the proposed Kapolei Parkway is evidenced by:

1. Oahu Regional Transportation Plan (ORTP);
2. Transportation for Oahu Plan 2025 (TOP 2025);
3. Oahu's Transportation Improvement Program (TIP); and the

City budgetary constraints make the timing of this completion uncertain. It should be noted that under the No-Build Alternative, funds for the construction of the portion of Kapolei Parkway, from Renton Road to the proposed North-South Road, will be solely provided by the City and County of Honolulu, and the completion of this facility is
anticipated prior to 2025, which corresponds to the planning horizon of the ORTP. Figure 2.1-6 illustrates the 2025 No-Build Alternative roadway network.

The future No-Build Alternative assumes a 794-bus fleet by 2025. This includes the Regional Bus Rapid Transit (BRT) proposed as part of the Primary Corridor Transportation Project, which is part of the TOP 2025. However, because North-South Road and its interchange with the H-1 Freeway does not exist in the No-Build Alternative, the proposed North-South Road Park-and-Ride is also assumed not to exist. In turn, the Regional BRT and local hub-and-spoke bus routes that would otherwise interact with the proposed North-South Road Park-and-Ride would need to be rerouted to other transfer facilities. This would lower the efficiency of transit service to the Ewa Plain area.

2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED

The following is a discussion of the project alternatives that were considered but eliminated.

2.2.1 TRANSPORTATION SYSTEM MANAGEMENT (TSM) ALTERNATIVE

The TSM Alternative is defined as the application of construction, operational, and institutional actions to increase the effectiveness of the present transportation system without large capital expenditures. The roadway network assumptions for this alternative would be the same as those for the No-Build Alternative as shown in Figure 2.1-2.

Relatively minor modifications of existing roadway facilities fall into this category. Since providing alternative access to the H-1 Freeway is a major purpose of the proposed North-South Road and Interchange, logical locations for these modifications would be at the existing Makakilo and Kualoa Interchanges. Both interchanges have already been modified in the recent past. The Kualoa Interchange was modified to provide an enhanced eastbound on-ramp that allowed traffic entering the H-1 Freeway to join the freeway traffic without merging. Both westbound off-ramps were improved to facilitate easier diverge traffic movements from the H-1 Freeway and more efficient traffic operations at the Kualoa Road ramp terminal locations. The Makakilo Interchange westbound off-ramp was enhanced to improve its operational capacity at the ramp terminal intersection with Makakilo Drive and the eastbound on-ramp merges were improved. Already assumed in the No-Build Alternative was the addition of a westbound on-ramp at the Makakilo Interchange, thereby increasing the efficiency of the interchange. Therefore, most relatively minor roadway construction improvements have been already implemented or are planned to occur as part of the No-Build Alternative.

Traffic operational improvements are assumed for all alternatives. It is assumed that traffic signals will take advantage of future enhancements in Intelligent Transportation System (ITS) to optimize traffic operations.
TDM actions recommended by the TOP 2025 (see Section 2.1.1.2) help to improve traffic operations by reducing the traffic demand. These actions are consistent with the definition of TSM actions, but they are part of the base transportation assumptions for all alternatives.

The remaining area of potential improvement without large capital expenditures is the enhancement of transit operations in the Ewa Plain, so that the TSM Alternative would provide a higher level of transit service to the study area than the No-Build Alternative. As summarized in Section 2.1.2, the absence of a North-South Road and its interchange with H-1 Freeway reduces the usefulness of the proposed North-South Road Park-and-Ride. The North-South Road Park-and-Ride is, therefore, assumed not to exist in the No-Build Alternative, and, for the same reason, it is assumed not to exist in the TSM Alternative. A transit only connection to H-1 Freeway at the location of the proposed North-South Road Interchange would be almost as costly and have similar environmental impacts as the proposed North-South Road and Interchange, disqualifying it as a TSM project. The TSM Alternative would, therefore, be limited to enhancement to the future transit system in the Ewa Plain to provide a higher level of transit service while utilizing the existing points of access to H-1 Freeway. Increasing the bus fleet would help, but it would experience diminishing returns as these transit vehicles would still need to funnel through the congestion bottlenecks at the existing Kunia and Makakilo Interchanges.

Because most of what would be considered TSM actions have been preempted by recent improvements, maintaining a TSM Alternative would either yield an alternative that resembled the No-Build Alternative or a variant of the Build Alternative. In either case the TSM Alternative is redundant and is, therefore, rejected.

2.2.2 ALIGNMENT ALTERNATIVES

Figure 2.1-3 shows the alignment alternatives considered. For detailed information on the alignment alternatives, see Appendix B, Corridor Alternatives Report (May 1998).

2.2.2.1 FORT WEAVER ROAD ALTERNATIVE

This alternative was developed in response to public and agency suggestions to maximize capacity within the Fort Weaver Road corridor as an alternative to constructing a new roadway. The Fort Weaver Road Alternative would upgrade the existing four-lane divided Fort Weaver Road to a four-lane freeway from Farrington Highway to Geiger Road. Grade-separated interchanges would be constructed at Geiger Road/Iroquois Point Road, Renton Road, the New East-West Road/Aawa Drive (West Loch Estates), and Lualauluwi (West Loch).

The Fort Weaver Road alternative does not satisfy the purposes of North-South Road. While it increases the capacity of Fort Weaver Road, it does not address the considerable congestion that exists and is forecast to worsen at the Kunia Interchange. This alternative would not adequately relieve adjacent transportation corridors, and would not provide a new access to the H-1 Freeway. Also, it would not improve vehicle
circulation in the region, nor provide access to planned developments within the Ewa region.

Since Fort Weaver Road would not service anticipated land uses and economic growth in the Ewa region and would not meet future transportation demands or roadway capacity needs, the Fort Weaver Road alternative was eliminated from further consideration.

2.2.2.2 EWA VILLAGES ALTERNATIVE

The Ewa Villages Alternative (the "Straight Alignment") would lie closer to a straight line between Ewa Beach and the proposed interchange with the H-1 Freeway, but would extend only between the H-1 Freeway and Kapolei Parkway. It would be a six-lane arterial roadway with at-grade intersections. This alternative was developed and assessed in response to public input (see Chapter 4).

There are two sub-alternative alignments. As shown in Figure 2.1.3, Sub-alternative A would begin at the tangent portion of Kapolei Parkway between Geiger Road and Koloweka Drive, continuing northwest through Ewa by Gentry, Ewa Mahiko Park, Ewa Villages Historic District, new housing lots, and the Ewa Villages Golf Course. Sub-alternative B would begin where the extension of Park Row will intersect Kapolei Parkway and would continue north along Park Row, cutting through the Ewa Villages Historic District and passing under the Golf Course within a tunnel. Both sub-alternatives would proceed toward the existing Palehua Road and the proposed interchange location on the H-1 Freeway.

Ewa Villages Sub-alternative A would displace at least 118 existing residences within the Ewa by Gentry subdivision and 11 residences in the Pepper Row area of the Ewa Villages Historic District. This sub-alternative would also affect a recreational center in the Ewa by Gentry development and two Section 4(f) resources: Ewa Mahiko Park and Ewa Villages Golf Course. [Section 4(f) of the U.S. Department of Transportation (DOT) Act prohibits the use of a publicly owned park for a DOT-supported transportation use unless there are no feasible and prudent avoidance alternatives.] A commercial building on the south side of Renton Road that houses the Friends of Ewa organization would also be affected.

Sub-alternative B would have fewer direct displacement impacts to the Ewa by Gentry and Ewa Villages developments, although it would still have impacts on six residences within the Ewa Villages Historic District along Pepper Row and affect one 4(f) resource (Ewa Villages Golf Course).

Both sub-alternatives would change the character of the Ewa Villages Historic District, which is on the State of Hawaii Register of Historic Places and has been nominated for the National Register of Historic Places (NRHP). Along with physical impacts to residences and buildings within this District, the Ewa Villages alignment alternatives would trigger additional review under Section 106 of the National Historic Preservation Act of 1966.
Both Sub-alternative A and Sub-alternative B would encroach upon the Ewa Villages Golf Course, a Section 4(f) resource that must be afforded protection. Mitigation to minimize the impact on the Ewa Villages Golf Course would require major modifications to the golf course, including placing North-South Road within a tunnel under the golf course fairways and reconfiguring the golf course layout. Construction of the North-South Road Tunnel would be expensive.

In addition, costly noise abatement walls would need to be constructed within Tonness Village to mitigate noise impacts to the existing homes.

In total, the Ewa Villages alignment would cost approximately $44 million more to construct than the Palehua Corridor alignment (the current Build alignment). Table 2.2-1 summarizes the costs of the alignment alternatives, which were developed in 1998 for comparison purposes only. These estimates included only major cost items, which are typically included in initial alternatives analyses.

Based on the severity of community impacts, the Section 106 and Section 4(f) impacts, high construction cost, and incompatibility with existing and proposed development, the Ewa Villages alignment alternatives were eliminated from further consideration.

Table 2.2-1:
Construction Cost of Alignment Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Construction Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewa Villages Corridor</td>
<td>$83.1 million</td>
</tr>
<tr>
<td>Palehua Corridor</td>
<td>$39.4 million</td>
</tr>
</tbody>
</table>


2.2.3 ROADWAY CONCEPT ALTERNATIVES

Five roadway concepts were evaluated to resolve the type of roadway facility and modal accommodation to be provided within the alignment ROW.

2.2.3.1 TRANSIT ON EXCLUSIVE RIGHT-OF-WAY

This alternative would restrict use of the road to public transit vehicles.

Historically, a transit corridor had been identified west of and within a 300-foot roadway easement in the Palehua Corridor, effectively providing a roughly 166-foot transportation corridor containing both a roadway and a transit corridor (see Figure 2.1-4). Recent transit studies such as the Final Environmental Impact Statement for the Primary Corridor Transportation Project (July 2003) show a transit corridor oriented along H-1 Freeway from the City of Kapolei to the Primary Urban Center of Honolulu. The Ewa Development Plan (Revised 2000), however, designates a transit corridor within the Palehua Corridor,
but it also clearly indicates a need for a major roadway in this corridor. Making this corridor a pure transit corridor would be inconsistent with the intent of the Ewa Development Plan, the OMPO Top 2025 Plan, and the Ewa Master Plan. Therefore, in its updated concept, the 300-foot roadway easement would become a 300-foot ROW that includes North-South Road, a rapid transit corridor, and support features such as drainage and bikeways.

2.2.3.2 FREEWAY OR EXPRESSWAY

Under the freeway option, North-South Road would be constructed as a 4-lane freeway with grade-separated interchanges. An expressway is similar to a freeway except that grade-separated interchanges would be provided only at heavily used intersections. Additional ROW beyond the existing Palehua Corridor easement would need to be acquired at the interchange locations for the freeway and expressway alternatives.

The freeway and expressway alternatives would be difficult to implement given the one-mile minimum spacing requirement of interchanges recommended in *A Policy on Geometric Design of Highways and Streets* (2001) by the American Association of State Highway and Transportation Officials (AASHTO). For example, the intersection of Farrington Highway and the proposed North-South Road would be a logical interchange for both the freeway and expressway alternatives. However, it is only one-half mile away from the proposed interchange of the H-1 Freeway, less than the minimum spacing, and combining the Farrington Highway Interchange with the North-South Road/H-1 Freeway Interchange would be very expensive. Based on the expense and minimum spacing requirements, the freeway and expressway alternatives were eliminated.

2.2.3.3 ARTERIAL WITH HIGH OCCUPANCY VEHICLE (HOV) LANES

As an arterial with HOV lanes, North-South Road would provide six lanes which would include two lanes (one in each direction) reserved for HOV. The HOV lanes would be separated from general-purpose lanes by pavement striping, and intersections would be at-grade.

Due to the relatively short length of North-South Road (2.2 miles), these HOV lanes would need to be integrated with HOV facilities on the H-1 Freeway to be effective. Although this alternative is compatible with the long-range future transportation plan, the HOV lanes would only provide substantial travel benefits if dedicated HOV access to the H-1 Freeway was provided, necessitating a very expensive interchange configuration. Given that a regional HOV system will only be available in the vicinity of North-South Road in the long-range future, the high cost of providing the necessary connection to the H-1 Freeway eliminated the HOV alternative at this time.
2.3 INTERCHANGE ALTERNATIVES

2.3.1 PROPOSED INTERCHANGE

Appendix C, Draft Interstate Access Modification Request (May 2004) discusses the
detailed interchange configuration screening, which determined the preferred North-
South Road Interchange described below. At the time of this writing, FHWA has not yet
approved the Interstate Access Modification Request.

The proposed North-South Road Interchange on the H-1 Freeway would be located
approximately midway between the Makakilo and Kunia Interchanges. The distance
between each interchange would be approximately 2.2 miles, consistent with Federal
Highway Administration (FHWA) guidance for interchange spacing (FHWA policy
statement “Additional Interchanges to the Interstate System”, Federal Register, February
11, 1998). Figure 2.3-1 illustrates the spacing between the proposed interchange and
the Kunia and Makakilo Interchanges.

Since the preferred alternative would implement a principal arterial roadway, a freeway-
to-arterial type interchange configuration of urban design is most appropriate. The
proposed North-South Road would pass under the H-1 Freeway to take advantage of the
existing grade difference between the H-1 Freeway and the surrounding land. The
ultimate preferred interchange configuration would service four legs and accommodate
all traffic movements. Signalization is proposed at the ramp terminal intersections.
Figure 2.3-2 shows the different interchange alternatives considered.

To fulfill each of these requirements, the conventional diamond interchange configuration
was selected because of flexibility in implementation, driver familiarity, ability for future
expansion, and acceptable traffic operations (see Appendix C). To accommodate
potential substantial traffic volumes of westbound to southbound movement, HDOT will
reserve the ROW in the northwest quadrant of the North-South Road interchange as a
part of this project. The future loop-ramp expansion will be a future project when traffic
volumes warrant the expansion. Figure 2.3-3 shows the conventional Diamond
Interchange configuration with the reserved future loop-ramp ROW.

An Interstate Access Modification Report has been prepared, and access to the H-1
Freeway will be permitted only upon formal acceptance of the report by the FHWA.

2.3.2 OTHER INTERCHANGE ALTERNATIVES

In addition to the conventional diamond interchange, other freeway-to-arterial type
interchange configurations considered included the diamond/ flyover interchange, the
Single Point Urban Intersection (SPUI) interchange, and the partial cloverleaf
interchange. Freeway-to-freeway interchanges, such as all-way directional and full-
cloverleaf, were eliminated from further consideration because of cost and system
appropriateness. The interchange alternatives were evaluated based on criteria such as
<table>
<thead>
<tr>
<th>TYPE OF INTERSECTING FACILITY</th>
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<tbody>
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<td>RURAL</td>
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<td>DIAMOND</td>
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<td>PARTIAL CLOVERLEAF</td>
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<td>COLLECTORS AND ARTERIALS</td>
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<tr>
<td>SYSTEMS INTERCHANGES</td>
<td>FREeways</td>
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<td>DIRECTIONAL</td>
</tr>
</tbody>
</table>

**Interchange Configuration Alternatives**
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 2.3-2
traffic operations, ROW requirements, cost, phasing options, and potential future expansion.

The combination diamond/flyover was eliminated because it would not increase Interchange level-of-service (LOS) and would require the most ROW. Additionally, it would be the most expensive of the interchange alternatives. Its flyover ramp would have projected visual and noise impacts both to the future UH-West Oahu Campus and to developments within the Ewa Plain.

The SPUI alternative would provide acceptable interchange LOS while requiring similar ROW and construction costs as the conventional diamond interchange. This interchange would require less ROW and would be less costly than the partial cloverleaf configurations but is less flexible in accommodating changes in future traffic conditions. The SPUI alternative must be constructed all at once due to the clear-span structure and ramp configuration therefore phased construction of this type of interchange is not feasible. Once built, the SPUI interchange is not easily expanded. Based on these characteristics, the SPUI alternative was eliminated.

Two similar partial cloverleaf configurations were considered: the partial cloverleaf and the modified partial cloverleaf. The modified partial cloverleaf configuration is preferred over the partial cloverleaf for the following reasons:

- The modified partial cloverleaf results in one less intersection on North-South Road. Even though this road serves a right-turn movement only, it requires construction of a separate ramp. The partial cloverleaf consolidates all movements into one loop ramp.

- The modified partial cloverleaf alternative provides more integrated access into the mauka property. Although its use is not known at this time, the mauka property could generate considerable traffic. Having the modified partial cloverleaf interchange is more familiar to the driver population. The partial cloverleaf interchange configuration will require a leaping curve before drivers are comfortable with the traffic operations in this configuration.

Based on the construction cost, flexibility in implementation, driver familiarity, expansion capabilities and acceptable traffic operation, the conventional diamond interchange configuration was selected and the ROW in the northwest quadrant of the North-South Road Interchange will be reserved by HDOT as a part of this project. The additional ROW will be for used for potential expansion of a westbound to southbound loop ramp as a part of a separate project when traffic volumes warrant.
CHAPTER 3
AFFECTED ENVIRONMENT, IMPACTS, AND PROPOSED MITIGATION

This chapter describes the environment of the project area, potential impacts of the proposed action, and proposed mitigation. Sections in this chapter address the various environmental or social disciplines analyzed for the proposed action. In general, each section describes existing conditions, any existing regulatory requirements pertaining to the discipline, potential impacts of the action, and mitigation measures, if any.

The discussion of potential impacts compares those identified under the 2025 No-Build Alternative (without the proposed action) with the 2025 Build Alternative. As described in Section 2.1, all facilities including Kapolei Parkway that would be built under the base case established by the No-Build Alternative are also assumed to occur in the Build Alternative. The proposed action is the construction of North-South Road and the federalization of Kapolei Parkway, and the No-Build Alternative assumes that Kapolei Parkway would be constructed by the year 2025, regardless of federal participation. Despite the acceleration of the Kapolei Parkway portion as a result of federal participation, there would be no additional impacts in the 2025 Build Alternative condition, compared to the No-Build condition. However, where federal regulations apply because of the federalization of Kapolei Parkway, this chapter identifies specific construction impacts of Kapolei Parkway as part of the Build alternative, in order to disclose the impacts of federalizing the project.

In this Chapter, as well as throughout this FEA/FONSI, the term “Kapolei Parkway” refers to the proposed segment of the roadway between the proposed North-South Road (starting at the City/State property line) and Renton Road, unless otherwise specified.

3.1 LAND USE AND PLAN CONSISTENCY

3.1.1 LAND USE

The proposed action is located in the Ewa region of Oahu. Ewa was once used primarily for sugarcane cultivation, but is now characterized by urban growth as the State of Hawaii and City and County of Honolulu develop the Ewa region as the “second city” of Oahu (see Section 1.1). Sugarcane is no longer cultivated on Oahu. Figure 3.1-1 displays existing zoning.

3.1.1.1 EXISTING LAND USES

The area surrounding the North-South Road and Kapolei Parkway Corridors is currently vacant and was used for sugarcane cultivation by the old Oahu Sugar Company. The existing residential suburban communities near the proposed project include Ewa by Gentry, Ewa Villages, and the Villages of Kapolei. Residential and other land uses
further away from the project site include West Loch Estates, Ewa Beach, the City of Kapolei, Makakilo, and Ocean Pointe (formerly Ewa Marina).

Ewa by Gentry was first developed in 1988, and includes a range of low-density suburban housing types from single-family to low-rise townhouses (i.e., duplexes). Ewa by Gentry also includes a private golf course (Coral Creek), a community park (Geiger Park), a neighborhood shopping center (Ewa Town Center), and an elementary school (Holomua Elementary).

Ewa Villages is the oldest community in the Ewa region. Built around the Ewa sugar mill in the 1890s, the villages grew over the next 60 years. At one time there were eight villages housing immigrant plantation workers. Now only Renton, Tenney, Varona, and Fernandez Villages remain. Renton and Fernandez Villages were redeveloped by the City and County of Honolulu (City) in the late 1970s and early 1980s, providing housing units on the Fort Weaver Road side of the community. Tenney Village was redeveloped in the 1990s for affordable housing, maintaining the plantation architecture of the community. Varona Village has not been redeveloped, but continues to be occupied by former plantation workers and their families. Ewa Villages also includes district and neighborhood parks, a municipal golf course, and a small commercial area on Fort Weaver Road.

The Villages of Kapolei are located west of the proposed North-South Road Corridor with the first homes completed in 1990. The community also includes an 18-hole golf course, parks, and elementary, middle, and high schools.

The City of Kapolei, located west of the Villages of Kapolei, is State-mandated as part of Honolulu’s Secondary Urban Center, complementary to the Primary Urban Center of Honolulu (Pearl City to Waikiki). Existing land uses include a community shopping center; a 16-screen movie theater complex; a 73-acre regional park; Campbell Square; and a Bank of Hawaii building. In addition to the City of Kapolei, the Secondary Urban Center includes Ko Olina Phases I and II, the Kaaawa Barbers Point Harbor area, Kapolei Business Park, and Campbell Industrial Park. Some of these areas are described below. Many government services have also been established in or near Kapolei to provide services to this Second City, including a State office building (Kakuhihewa Building), Kapolei Hale (a City civic center complex), two fire stations, a police station, and a transit center.

Much of Ewa to the south of the project area was taken up by the former Barbers Point Naval Air Station (BPNAS) (see Figure 3.1-1). BPNAS was established during World War II and used to support naval aviation activities and units. The base closed on July 2, 1999, and was rededicated by the State of Hawaii as the Kaaawa Community Development District. The Kaaawa Redevelopment Plan, which was adopted by the Honolulu City Council by Resolution 01-86, was developed to establish the policies, principles, and guidelines for redevelopment of the BPNAS Special Area. The former base is now open to the general public. For instance, the beach park is open for public use. However, the Navy still maintains some housing and recreational facilities, such as the Barbers Point Golf Course and beach cottages. Other existing land uses in the former base include Barbers Point Elementary School; Hawaii Army National Guard
base; U.S. Coast Guard C-130 Operations; general aviation airport, Honolulu Community College’s Aviation Flight Training program, and support buildings; and some residential and miscellaneous light industrial uses.

Despite rapid urbanization of most of Ewa, agriculture still remains, but is different from the large-scale cultivation of years past. The Estate of James Campbell, a major landowner in Ewa along with the State of Hawaii, leases parcels near the project area to small-scale farms cultivating diversified agricultural crops, such as vegetables, fruits, and herbs.

Ewa Beach, West Loch Estates, West Loch Fairways, Ocean Pointe, and Makakilo are other residential communities within the vicinity of the project, which have a mix of single-family and multi-family units.

3.1.1.2 LAND USE DEVELOPMENT TRENDS

According to State of Hawaii and City and County of Honolulu plans and policies, the Ewa region is to be the site of a “second city” in order to provide opportunities for residential and employment growth. This second city assists in island development, while relieving urban development pressures in Waianae, North Shore, Koolauloa, and Koolau Piko. According to the Ewa DP (May 2000), it is projected that the Ewa region would accommodate 13 percent of Oahu’s 2025 population, or roughly 133,574 persons and approximately 58,659 jobs by the Year 2025 (Interstate Access Modification Report, 2003). Refer to Table 1.2-1 for a summary of population, employment, and development trends in the Ewa region. The additional population would live primarily in master planned communities such as the Ewa Villages, Ewa by Gentry, City of Kapolei, Makakilo, Makaiwa Hills, a residential subdivision west of Makakilo, Villages of Kapolei, and Ocean Pointe. The growth anticipated for these and other existing residential and commercial/industrial developments include the following:

Ewa Villages – The Ewa DP estimates that there would be approximately 1,585 housing units in Ewa Villages in 2020, consisting of affordable housing, market-priced housing, and 200 units of rehabilitated housing. According to OMPO Forecasted Land Use Model’s Population and Employment Comparison for Years 2000 and 2025 (OMPO’s Land Use Model), population for “Ewa & Ewa Beach” (see Ewa Beach below) is expected to increase by 16 percent, the number of housing units is expected to increase by 182 percent, and total employment is expected to increase by 30 percent during that period.

Ewa Beach – As noted above, population, housing, and employment for Ewa and Ewa Beach are expected to increase substantially, although Ewa Beach has experience only limited growth in the past decade.

Ewa by Gentry – The Ewa DP notes that 7,678 housing units are anticipated in Ewa by Gentry by the year 2010.
Makakilo – According to the OMPO Land Use Model data comparisons between Year 2000 and Year 2025, population in Makakilo is expected to increase by 28 percent, the number of housing units is expected to increase by 43 percent, and total employment is expected to increase by 428 percent during that period.

Villages of Kapolei – The Villages of Kapolei, like the City of Kapolei, are a vital component of Oahu’s Secondary Urban Center. According to the OMPO Land Use Model data, the Villages of Kapolei had a 2000 population of 3,301 people, and are projected to increase by approximately 103 percent to a total population of 6,712 by 2025. Housing units in Villages of Kapolei in 2000 were estimated at 888, and OMPO projects a total of 2,027 housing units by 2025, an increase of 128 percent. OMPO projects the largest growth to be in total employment, rising from 53 in 2000 to total employment of 2,756 in 2025, an increase of 510 percent.

West Loch Estates and West Loch Fairways – Phase I of the West Loch Estates included 600 single-family homes. West Loch Fairways includes 720 single-family homes and 120 townhouses.

James Campbell Industrial Park – The James Campbell Industrial Park is Hawaii’s largest industrial park (1,367 acres) and Kapolei’s largest job center, accounting for more than 4,500 jobs. According to the OMPO’s Land Use Model, the area mauka of Joseph Campbell Industrial Park had a 2000 population of 38, which is projected to rise to 3,591 by the year 2025, a substantial increase of 9,350 percent. The number of housing units is projected to rise nearly 3,500 percent from 3 in 2000, to 1,051 in 2025; and the total employment is projected to increase from 3,016 in 2000 to 11,863 in 2025, an increase of approximately 239 percent.

Kalaëola (formerly BPNAS) - The OMPO Land Use Model indicates that in the year 2000 Kalaëola had a total population of 4,609, which is projected to decrease to a 2025 population total of 4,276, a decline of approximately seven percent. Housing units, according to the OMPO, would remain stable at 1,446 units from 2000 to 2025, while total employment is projected to increase by six percent, from 4,493 in 2000 to an anticipated 4,767 in 2025.

Kapolei Business Park – The Kapolei Business Park, which opened in 1994, is located next to James Campbell Industrial Park and Kalaëola Harbor. A private investment firm recently agreed to buy all the undeveloped property at Kapolei Business Park, approximately 91 acres (The Honolulu Advertiser, April 6, 2004).

City of Kapolei – The Ewa DP projects that by 2020 the City of Kapolei would house more than 7,000 residents and provide work sites for 25,000 private jobs and 5,000 City and State jobs, much of which would be located at the City’s Civic Center, and the State office building. This reflects the anticipated growth of the City of Kapolei as the heart of Oahu’s Secondary Urban Center.

Honouliuli – Honouliuli is an older residential community east of and along Old Fort Weaver Road makai of Farrington Highway. It includes residences, shops and a ranch.
Ko Olina – The Ko Olina project includes the Ko Olina Resort & Marina, a 652-acre major resort approved for hotel (e.g., Marriott's Ihilani Resort & Spa); time-share; commercial; recreational development, including golf courses and a 43-acre marina with 270 full service slips; and private luxury residences. According to the OMPO's Land Use Model, Ko Olina had a population of 2,450 in 2000, which is projected to increase to 8,701 by 2025, an increase of 255 percent. The number of housing units is expected to increase from 581 in year 2000, to 2,322 units in 2025, or approximately 303 percent. Total employment is projected to increase 966 percent from 3,016 in 2000 to 11,863 in 2025.

Ocean Pointe – In 1989, Haseko Homes, Inc. purchased the 1,100-acre parcel, then called the Ewa Marina Project. The parcel includes 3½-mile of oceanfront. Construction of Phase 1 homes began in 1997, when the project was renamed Ocean Pointe. Phase 2 began in 2001. As of May 2003, about 1,000 homes had been sold and built. Haseko plans to build another 960 homes in Ewa as part of Phase 3 of its Ocean Pointe development.

The City's Bus Rapid Transit (Regional BRT) would be constructing a park-and-ride on roughly four acres of land on North-South Road near the H-1 Freeway.

Figure 3.1-2 shows land uses proposed for the near future. Future developments near the corridor include the following planned projects:

DHHL – In November 2002, BLNR granted DHHL a right-of-entry to approximately 200 acres at the Kapolei property and began the process of transferring those parcels to DHHL. The acquisition of these parcels allows DHHL to plan and develop approximately 1,000 residential homesteads and potentially some commercial and community facility uses to serve the new subdivision over an 8 to 10 year period from 2006-2016. It is anticipated that DHHL would construct the final portion of Kapolei Parkway between the southern terminus of North-South Road and the existing cul-de-sac of Kapolei Parkway within the Villages of Kapolei. Therefore the DHHL project would complete the portion of Kapolei Parkway connecting Ewa and Kapolei, thus allowing traffic to flow between the two locales.

UH-West Oahu – The University of Hawaii is planning to build a new West Oahu campus makai of Farrington Highway, and west of the proposed North-South Road. At one time the proposed site for the new UH-West Oahu was mauka of the H-1 Freeway. Currently, it is planned for a site makai of Farrington Highway. The UH campus at the proposed location was approved by the UH Board of Regents on September 27, 2002, and in July 2004, the Board adopted the Long Range Development Plan (LRDP) for the UH West Oahu campus. The university would encompass roughly 500 acres currently being used by Aloun Farms and A.M. Enterprises for agriculture (State of Hawaii, Fee Conveyance, 2002). According to the LRDP, the initial phase of the campus is anticipated to be completed in the Fall of 2008, with populations of 1,520 students and 360 staff. The ultimate 97-acre campus would have 7,600 students and 1,040 staff. The University is also considering a public/private partnership to develop an additional 320 acres adjacent to the campus, including a mixed-use village and commercial and residential uses. UH has stated that this development could commence prior to, or about the same time as, the development of the initial campus. The remaining 53 acres of land would be
used for roads, open space, parks, an elementary school, and other non-income generating land uses.

East Kapolei Area – According to the O‘MPO’s Land Use Model, the 2000 population of the East Kapolei area was 5,455, which is projected to increase to 25,372 by 2025, an increase of approximately 365 percent. Housing units in East Kapolei numbered 1,473 in 2000 and are projected to increase to 7,584 housing units in 2025, an increase of approximately 415 percent, while total employment in 2000 was 1,071 and is projected to increase to 5,227 in 2025, for an increase of approximately 388 percent.

Mehana – Schuler Homes plans to build 1,150 homes on 120 acres on the edge of Kapolei’s civic center, during the next 11 to 16 years. The community, called Mehana, is designed to have six parks, running and cycling paths, a recreation center, pool, commercial complex, and an approximately 50-50 mix of single-family and multi-family homes. Schuler and Campbell Estate Plan to contribute a 12-acre adjacent site for a new elementary school (The Honolulu Advertiser, March 30, 2004).

3.1.1.3 POTENTIAL DISPLACEMENT AND RELOCATION IMPACTS

The proposed improvements would require acquisition of land that would be converted from vacant or agricultural use into a transportation facility. Currently, the State of Hawaii, the City and County of Honolulu, and EJC own the land along the North-South Road Corridor and the portion of Kapolei Parkway between Renton Road and North-South Road. Land would need to be acquired from the EJC in order to connect North-South Road from Kapolei Parkway to the H-1 Freeway. Property acquisition for those affected by the proposed project will be acquired pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Federal Public Law 91-648), revised 1987.

3.1.1.3a No-Build Alternative

The City and County of Honolulu owns the roughly 9.8 acres of vacant property that would be used for Kapolei Parkway from Renton Road to the proposed North-South Road. The City will subdivide this property from an existing larger parcel owned by the City, in order to create the right-of-way (ROW) for its portion of Kapolei Parkway. Therefore, no land acquisitions or displacements would be required for the construction of Kapolei Parkway. Moreover, the No-Build Alternative assumes that the section of Kapolei Parkway would be built by 2025, regardless of the federalizing action.

3.1.1.3b Build Alternative


September 2004
parcels owned by the DLNR and EJC are currently used for diversified agriculture by A.M. Enterprises, Inc., Sugarland Farms, Inc., and Aloun Farms, Inc. under short-term revocable permits. These farms may potentially be affected by ROW acquisition and the loss of some of their agricultural fields. However, none of these farms would be fully displaced by the project. Relocation of farms will not be necessary, because the remaining fields would still be productive, and the farmers would be able to maintain their operations in the short term. In the long-run, these existing short-term farm leases would expire and/or would not be continued, because DLNR and EJC anticipate the conversion of these lands from agricultural use to urban use, such as the planned development of UH-West Oahu.

In addition to the displacement of some agricultural lands for the North-South Road ROW, farm land located north of the H-1 Freeway, which are accessed via the existing Palehu Road, may require alternate access options because the ultimate phase of the project would displace Palehu Road. Access to all agricultural properties would be maintained during and after construction (see Section 3.2). Grace Pacific Corporation, located north of the H-1 Freeway, utilizes Palehu Road to access their quarry and concrete batch plant. The State of Hawaii Department of Transportation (HDOT) would coordinate with Grace Pacific Corporation to maintain access between its quarry operations located makai and mauka of the H-1 Freeway.

3.1.1.4 POTENTIAL IMPACTS ON LAND USE DEVELOPMENT

This section describes potential impacts that North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road would have on current land use development trends.

As described in Sections 3.1.1.1 and 3.1.1.2, the Ewa region has experienced substantial development within the last couple of decades, and private and public developers are proceeding with planned residential, commercial, and institutional developments in areas surrounding North-South Road. Planned developments of particular note include UH-West Oahu that would be located adjacent to the proposed North-South Road alignment, DHHL homesteads next to North-South Road, and continuing residential, commercial, park and institutional (e.g., public schools) developments in the communities of Kapolei, Ewa Villages, and Ewa by Gentry. With the exception of the UH campus, these developments are consistent with the current General Plan of the City and County of Honolulu and the Ewa DP.

3.1.1.4a No-Build Alternative

Under the No-Build Alternative, the vacant North-South Road Corridor area would not be converted to a highway, but the portion of Kapolei Parkway between Renton Road and North-South Road would be constructed by the City between what would have been the North-South Road makai terminus and Renton Road. In addition, public agencies and private developers would construct other sections of Kapolei Parkway so that it becomes a continuous roadway from Ocean Points, through the Villages of Kapolei, and continuing to Kalaeloa Boulevard. This connection would improve general circulation for
the greater Ewa Plain that would support development of vacant open space areas
surrounding Kapolei Parkway from the Villages of Kapolei to Ocean Pointe, which are
planned to be converted to approved urban uses per the Ewa DP. However, these lands
would still require a State Land Use District Boundary Amendment (SLUBA) to
reclassify them to urban use. The SLUBA must occur prior to any zoning changes.

3.1.1.4b Build Alternative

Under the Build Alternative, North-South Road would add to the future No-Build roadway
network in the Ewa Plain, which would include the completed Kapolei Parkway from
Ocean Pointe to Kalaecho Boulevard. The action federalizing the portion of Kapolei
Parkway under the Build Alternative would accelerate the timing for constructing the
City’s portion of Kapolei Parkway, but otherwise, the roadway would be the same as
under the No-Build Alternative. Developments and improvements planned in the area
would gain even greater transportation access, because North-South Road would
provide an alternative route for residents to access the H-1 Freeway, Farrington
Highway, and adjacent areas.

Since the proposed project and surrounding area are master planned in the Ewa DP and
in the Kapolei Area Long Range Master Plan, the project is not anticipated to induce
more development than what is currently considered and, therefore, would not intensify
the general land use conditions. It would, however, facilitate improved circulation for
impending improvements, including the proposed UH-West Oahu. Therefore, the
proposed project may accelerate the pace of planned development in the region
notwithstanding market and governmental budgetary conditions and constraints.

It should be noted that some future development may be affected by colonies of the
endangered plant, Kooloaula (Abutilon menziesii), which were found along North-South
Road and the portion of Kapolei Parkway between Renton Road and North-South Road.
As stated in Section 3.7, a Habitat Conservation Plan (HCP) was approved by the State
of Hawaii Board of Land and Natural Resources, which would implement a temporary
temporary contingency reserve area to mitigate impacts to the species. The HCP was submitted to
the Service on March 23, 2004, as the BA to initiate “formal consultation” with the Service
under Section 7 of the Endangered Species Act (see Section 3.7 for further information).

3.1.2 CONSISTENCY WITH GOVERNMENTAL PLANS, POLICIES
AND CONTROLS

3.1.2.1 STATE OF HAWAII PLANS AND CONTROLS

3.1.2.1a Hawaii State Plan

The Hawaii State Plan (June 1991) consists of comprehensive goals, objectives, policies
and priorities for all areas of government functions. These functions include the
protection of the physical environment, the provision of public facilities systems, and the
promotion and assistance of socio-cultural advancement.
The State of Hawaii is encouraging population and employment growth in the Ewa region, which is designated as Oahu’s "second urban center". With major employment centers to be located in the City of Kapolei, Kaaawa Barbers Point Harbor, and Ko Olina resort, and residential developments to be located in planned communities such as Ocean Pointe, Ewa by Gentry, Ewa Villages, and the Villages of Kapolei, transportation infrastructure is needed to efficiently develop Ewa as a place where people can live and work. All project alternatives would provide additional transportation infrastructure to support these State of Hawaii objectives. The Build Alternative supports these objectives more than the No-Build Alternative by improving regional access to the H-1 Freeway, local circulation, and roadway levels of service to a greater degree (see Section 3.3.1).

The State Plan also promotes the continued viability of Hawaii’s sugar and pineapple industries, as well as growth in diversified agriculture. Although the project corridor is located on land formerly used for growing sugarcane, cultivation in Ewa ceased in 1995 for reasons unrelated to the proposed project. There are no State or City plans to convert the affected former sugarcane land to diversified agriculture permanently, because there are ample and more productive lands elsewhere (see Section 3.1.1).

The State Plan seeks to promote federally supported activities in Hawaii that respect Statewide economic concerns, are sensitive to community needs, minimize adverse impacts on Hawaii’s environment, and strengthen federal-state-county communication and coordination on federal activities affecting Hawaii. Under the Build Alternative, federal funds would be used in the construction of North-South Road and federalization of Kapolei Parkway, infusing federal money into the local economy. In comparison, the No-Build Alternative assuming the construction of only Kapolei Parkway with only local funds would not contribute additional federal money to Oahu’s economy, because the City segment of Kapolei Parkway would not be built with federal funds.

Objectives and policies also support Hawaii’s visitor attractions and facilities, and seek to increase accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes. The Build Alternative would improve access to and from the Ewa Plain as a whole. It would also improve access to future parks and recreational facilities throughout Ewa. The No-Build Alternative would also provide access improvements to future park and recreational resources, but not to the extent of the Build Alternative.

Under objectives for transportation facility systems, the State Plan has policies that: seek multi-modal system conformance with desired growth patterns and physical development; coordinate state, county, federal, and private transportation activities and programs; encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties; and encourage transportation systems that serve to accommodate present and future development needs of communities. The proposed project is being planned through a cooperative effort involving HDOT, the Federal Highway Administration (FHWA), and the City and County of Honolulu Department of Transportation Services (DTS).
3.1.2.1b Hawaii State Land Use Controls

Lands in the State are divided into four classifications: Urban, Agriculture, Rural, and Conservation. Each classification has specific land use objectives, development constraints, and administrative control. North-South Road and the portion Kapolei Parkway between Renton Road and North-South Road would traverse lands designated as Agriculture. In light of development policies set in the Ewa DP, it is expected that landowners would petition the State Land Use Commission to redesignate agriculture lands surrounding North-South Road and Kapolei to urban classifications.

3.1.2.1c Coastal Zone Management

The objectives and policies of the Hawaii Coastal Zone Management (CZM) Program are designed to protect and manage Hawaii's valuable coastal areas and resources. The proposed North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road are located within the State’s CZM area. Pursuant to 15 CFR 930.32, federally-permitted, licensed or assisted activities undertaken in or affecting Hawaii's coastal zone must be consistent with the CZM objectives and policies.

The following discussion describes the project's consistency with the objectives and policies of the State's CZM Program. This assessment will be reviewed by the Department of Business, Economic Development and Tourism (DBEDT) Office of Planning, the agency administering the State's CZM program.

Recreation Resources

North-South Road and the portion of Kapolei Parkway between North-South Road and Renton Road would improve access to existing and future park and recreational facilities in Ewa, such as Ewa Mahiko District Park, and coastal areas (see Section 3.11). The No-Build Alternative would also provide improved access to these future park and recreational resources, but not as well as the Build Alternative, which provides an interchange connection to the H-1 Freeway.

Historic Resources

The project's Area of Potential Effect is highly unlikely to contain archaeological resources mainly because of past sugarcane cultivation activities (see Section 3.10). The only historic property that may be affected by the project is the Ewa Villages Historic District. The Kapolei Parkway/Renton Road intersection would be within the boundaries of the district, and the alignment of Kapolei Parkway was planned by the City with consideration of the historic properties in the Ewa Villages Historic District. Despite the intersection likely warranting traffic signals, the historic integrity of the district will be unaffected. See Section 3.10 for additional information.

Scenic and Open Space Resources

The Ewa DP recommends a network of green space and green ways to link urban and employment centers with new and established residential communities. The section of
Kapolei Parkway discussed in this document will be a roadway with a landscaped median and sidewalks. North-South Road will also include landscaped medians and sidewalks. Therefore, none of the alternatives compromise the green space objectives.

**Coastal Ecosystems**

The project area is not located within the Shoreline Setback Area or the Special Management Area (refer to Section 3.1.2.2d). Therefore, none of the alternatives would affect coastal ecosystems.

**Economic Uses**

To accomplish the economic objectives of the Ewa region (see Section 3.1.2.2b), suitable infrastructure must be developed. The Build Alternative would provide substantial roadway improvements, such as providing additional access to the H-1 Freeway, as well as improving local circulation and roadway levels of service. The No-Build Alternative would also provide transportation infrastructure to support the economic objectives of the region, but not to the extent of the Build Alternative.

**Coastal Hazards**

North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road are not located in a tsunami evacuation zone or other coastal hazard areas. Roadway improvements provided under the alternatives would facilitate emergency evacuation from nearby coastal areas in the event of a tsunami or other coastal hazard. The addition of North-South Road in the Build Alternative would provide the Ewa region with an additional linkage to the H-1 Freeway, as well as improve local circulation and roadway levels of service. The Build Alternative would therefore facilitate evacuation more efficiently than the No-Build Alternative.

**Managing Development**

The project would require State and City and County of Honolulu permits and approvals that include provisions for public participation and ensure protection of coastal resources. The project would also provide necessary roadway infrastructure to accommodate existing and planned future travel demand.

**Public Participation**

To date, project planning has included an agency pre-consultation meeting and presentations before the region's neighborhood boards. Consultations with federal and State, and County agencies were also conducted pursuant to other regulatory requirements. The public was provided a 30-day review period to provide comments on the project's Draft EA that was released on December 23, 1998. An additional 30-day review period began when the Revised Draft EA prepared pursuant to Hawaii Revised Statutes, Chapter 343, was published on July 23, 2004. A door-to-door public outreach effort was conducted in Varona Village in late July to early August of 2004. A public
North-South Road and Kapolei Parkway Final Environmental Assessment

hearing was held on September 1, 2004 to take public testimony regarding the project. For more details on public participation opportunities, see Chapter 4.

Beach Protection

North-South Road and the portion of Kapolei Parkway between North-South Road and Renton Road are not proposed near, adjacent to, or abutting a shoreline. Therefore, none of the alternatives would affect coastal erosion.

Marine Resources

The project would not affect marine or coastal resources because North-South Road and the portion of Kapolei Parkway between North-South Road and Renton Road would not be adjacent to or abutting the shoreline. Also see Coastal Ecosystems and Beach Protection above.

3.1.2.2 CITY AND COUNTY OF HONOLULU PLANS AND CONTROLS

3.1.2.2a General Plan of the City and County of Honolulu

The General Plan (revised 2002) provides broad statements on the objectives and policies of the City and County of Honolulu with regard to the overall physical and economic development of the island, as well as to the health and safety of the island’s residents. Some of the policies advocate:

- Allocating funds from the City and County’s capital improvement program for public projects that are needed to facilitate development of the secondary urban center;
- Encouraging the development of a major residential, commercial, and employment center within the secondary urban center; and
- Coordinating plans for the development of the secondary urban center at Kapolei with the State and Federal governments and with the sugar industry.

All of the alternatives would be consistent with the General Plan’s objective to develop a secondary urban center in Ewa with its nucleus in Kapolei.

The Ewa Impact Fee Ordinance (Chapter 33A, Revised Ordinances of Honolulu) sets forth a regulatory scheme for the assessment and collection of impact fees to be borne on a pro-rata share basis by landowners, developers, home builders, and others who directly contribute to expanding the population and increasing economic activity in the Ewa region through new land development activities. The impact fee identifies six roadway facilities within the Ewa Plain targeted for improvement: new North-South Road from H-1 Freeway to Kapolei Parkway, new Kapolei Interchange, new westbound ramps at Makakilo Interchange, Fort Barrette Road widening from Farrington Highway to F.D. Roosevelt Avenue, Fort Weaver Road widening from Farrington Highway to North Road, and complete missing segments of Kapolei Parkway from Ko Olina Resort to Papipi Road. These State and City projects are described in Section 2.1.1.
Under the No-Build Alternative, the construction of the portion of Kapolei Parkway between North-South Road and Renton Road by the City would contribute to the completion of Kapolei Parkway. A completed Kapolei Parkway would substantially improve linkages between commercial and office development in Kapolei and residential development in the eastern part of the Ewa region. Under the Build Alternative, North-South Road would provide additional system improvements by providing additional access between existing and new developments, and the H-1 Freeway.

All alternatives will also be consistent with policies seeking to develop transportation and utility systems on Oahu. Transportation improvements under the No-Build Alternative would be made and used to guide planned growth and desirable land use patterns in the Ewa region. Under the Build Alternative, North-South Road would provide additional system improvements by providing access to the H-1 Freeway.

3.1.2.2b Ewa Development Plan (Ewa DP)

The Ewa DP consists of vision statements, community design principles and guidelines; and conceptual mapping of open space networks, public facility networks, and urban land uses. The Ewa DP was the first to be updated using this new plan format. Previous DPs contained site specific land use and public facilities maps. The new Ewa DP was approved by the City Council in 1997 and revised in 2000.

The Ewa DP’s vision for Ewa is the development of a “secondary urban center” on Oahu to provide opportunities for residential growth and urban development. The secondary urban center includes the City of Kapolei, Ko Olina, the Kalaeloa Barbers Point Harbor area, Kapolei Business Park, and Campbell Industrial Park. The Ewa DP projected that there would be close to 28,000 housing units in the Ewa area by the Year 2020, located primarily in master planned communities.

The Ewa DP also envisions substantial job growth, estimating that by 2020 there would be over 64,000 jobs in the Ewa DP area. The City of Kapolei would provide worksites for 25,000 private jobs and 5,000 City and State jobs. Many of the City of Kapolei jobs would be supported by development of the UH-West Oahu with 7,600 students and 800 staff and faculty members.

The Ewa DP Urban Future Land Uses Map (Figure 3.1-2) depicts substantial urban land uses throughout the Ewa Plain and shows North-South Road and Kapolei Parkway along generally the same alignment described in Section 2.1. All alternatives would be consistent with the Ewa DP because they provide transportation infrastructure to support planned land use development. However, the No-Build Alternative would not be as consistent with the Ewa DP as the Build Alternative, because it would not provide a new arterial roadway to the H-1 Freeway, which is needed to accommodate future regional growth.

Kalaeloa Redevelopment Plan

The BPNAS is the only area in the Ewa region with Special Plan Area status. The main goal of the Kalaeloa Redevelopment Plan (2000) is to integrate the BPNAS with land use
and infrastructure in the West Oahu area and to develop links with the regional transportation network to enhance accessibility among other West Oahu communities with activities on the BPNAS site. The circulation plan includes the extension of the proposed North-South Road to Coral Sea Road near the San Jacinto Road Intersection. In November 1998, the Redevelopment Commission revised the plan so that the Coral Sea Road extension was relocated to the east side of the navigational facility to more properly align with the North-South Road and avoid relocating the facility.

The No-Build and Build Alternatives would be consistent with the Ewa DP because they provide transportation infrastructure to support planned land use development. However, the No-Build Alternative would not be as consistent with the Ewa DP as the Build Alternative, because it would not provide a new arterial roadway to the H-1 Freeway, which is needed to accommodate future regional growth. The proposed North-South Road does not include extension to Coral Sea Road because it would be beyond the purposes and needs of the project. However, the project does not preclude such an extension in the future if warranted.

3.1.2.2c Zoning

City and County of Honolulu zoning is required to be in conformance with Development Plan designations of the Department of Planning and Permitting (DPP) and Land Use Ordinance (LUO). The LUO provides a list of zoning districts and precints and the permitted uses and structures for each district and precinct. The purpose of the LUO is to regulate land use to encourage orderly development in accordance with adopted land use policies, including the Oahu General Plan and Ewa DP, and to promote and protect the public health, safety and welfare.

North-South Road and the portion of Kapolei Parkway between North-South Road and Renton Road would traverse lands currently zoned as AG-1 (restricted agriculture). In the near future, the land surrounding both roadways would be re-zoned to Residential, Commercial, Public Facility, Parks or other similar urban-related zones due to future developments (see Section 3.1.1.2).

3.1.2.2d Special Management Area (SMA)

HRS Chapter 205A outlines special controls, policies and guidelines for development within an area along the shoreline referred to as the Special Management Area (SMA), as designated by the 1975 Shoreline Protection Act. Under this Act, the City's DPP administers the SMA use permit program for Oahu with authority to issue permits for development activities proposed within the SMA.

No portion of the proposed project is within the SMA; therefore, no permit is required.

3.1.2.2e Transportation for Oahu Plan (TOP 2025)

TOP 2025 is the regional transportation plan (RTP) adopted by OMO on April 6, 2001. It replaced the previous ORTP, adopted in November 1995. The TOP 2025 responds to the changing needs of Oahu and extends the horizon year to 2025. The purpose of TOP
2025 is to identify facilities and programs to meet increased travel demands through the Year 2025. Top 2025 Project number E-17 describes "North-South Road Kapolei Parkway to the H-1 Freeway (includes new interchange with the H-1 Freeway)" in Ewa, and Project number E-13 refers to the completion of Kapolei Parkway (Kapolei to Ewa Beach).

The No-Build Alternative would not be completely consistent with the TOP 2025 because it would not provide an arterial roadway connecting with the H-1 Freeway as recommended in the plan, while it does contribute to the completion of Kapolei Parkway. The Build Alternative would fulfill the recommendation of the TOP 2025 to construct North-South Road from Kapolei Parkway, including an interchange with the H-1 Freeway, and would contribute to the completion of Kapolei Parkway.

3.1.3 MITIGATION MEASURES

Once the proposed project is completed, land uses within the North-South Road Corridor would be converted from agricultural uses to a transportation facility. The Kapolei Parkway Corridor would also be converted to transportation use under the No-Build and Build Alternatives. However, these conversions are not considered a major or unforeseen impact because the change is anticipated in many approved planning documents as detailed above. Therefore, no mitigation measures are required. See Section 3.2.3 regarding mitigation measures for farmland displacements.

3.2 GEOLOGY, SOILS, AND FARMLAND

3.2.1 EXISTING CONDITIONS

3.2.1.1 PHYSIOGRAPHY, GEOLOGIC SETTING, AND SOILS

The project site is located on the relatively flat Ewa Plain of Oahu. From the coast in the area around Oneula Beach Park to Ewa Villages, a distance of approximately 2.5 miles, the elevation rises to 40 feet above sea level, for an average grade of 0.3 percent. From Ewa Villages to Farrington Highway, a distance of approximately 2.2 miles, the elevation rises to 160 feet, for an average grade of 1 percent. North (mauka) of Farrington Highway and the H-1 Freeway, the topography is steeper, as it rises to the Waianae Mountain Range.

The geology of the Ewa Plain consists of ancient coral-algal reefs interbedded with layers of alluvial and marine sedimentary deposits. These layers are built atop a basalt core of Pliocene-age Waianae Volcanics, and were formed as worldwide climatic changes and crustal adjustments led to large fluctuations in sea level. These layers start at approximately the middle of the Ewa Plain and also act as a "caprock" that prevents the seaward migration of potable groundwater in the Southern Oahu Basal Aquifer, a designated sole source aquifer (see Section 3.8). The geology of the north end of the Ewa Plain transitions to terrestrial alluvium over the underlying basalt core.
3.2.1.2 FARMLANDS

Soils as classified by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) in the general vicinity of the project are shown in Figure 3.2-1. Table 3.2-1 describes the soils shown on Figure 3.2-1.

<table>
<thead>
<tr>
<th>Series</th>
<th>Soils Classified as Prime or of Statewide Importance in the Project Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime</td>
<td>Ewa -- Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes</td>
</tr>
<tr>
<td></td>
<td>EmA -- Ewa silty clay loam, 3 to 6 percent slopes</td>
</tr>
<tr>
<td></td>
<td>Honoluli -- Honolulu clay, 0 to 2 percent slopes</td>
</tr>
<tr>
<td></td>
<td>EwC -- Ewa stony silty clay, 6 to 12 percent slopes</td>
</tr>
<tr>
<td></td>
<td>HxA -- Honolulu clay, 2 to 6 percent slopes</td>
</tr>
<tr>
<td></td>
<td>HxB -- Honolulu clay, 2 to 6 percent slopes</td>
</tr>
<tr>
<td></td>
<td>Kawaihapa -- Kawaihapa clay loam, 2 to 6 percent slopes</td>
</tr>
<tr>
<td></td>
<td>Waiaku -- Waialua stony clay loam, 0 to 3 percent slopes</td>
</tr>
<tr>
<td></td>
<td>Waipahu -- Waipahu stony clay, 0 to 2 percent slopes</td>
</tr>
<tr>
<td></td>
<td>Molokai -- Molokai stony clay loam, 7 to 15 percent slopes</td>
</tr>
<tr>
<td>Statewide Importance</td>
<td>Kawaihapa -- Kawaihapa clay loam, 2 to 6 percent slopes</td>
</tr>
<tr>
<td></td>
<td>Mokala -- Mokala stony clay loam, 0 to 12 percent slopes</td>
</tr>
<tr>
<td></td>
<td>Molokai -- Molokai stony clay loam, 15 to 25 percent slopes</td>
</tr>
</tbody>
</table>


The Ewa Plain was once a major agricultural area primarily used to cultivate sugarcane. However, sugarcane has not been cultivated in Ewa since 1995. Despite recent rapid urbanization, much of the Ewa Plain is still classified and zoned for agricultural use by the State of Hawaii and City and County of Honolulu, respectively. In addition, much of Ewa that is not urbanized is classified as “Prime Agricultural Land” according to the Agricultural Lands of Importance to the State of Hawaii (ALISH) land classification system (1977). Figure 3.2-2 depicts the areas of prime and other agricultural lands of importance. There are no areas of unique agricultural lands of importance within the project vicinity. North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road alignments would be almost entirely within Prime Agricultural Land; the North-South Road interchange with H-1 Freeway would mostly cover Other Important Agricultural Lands.

Due to the availability and quality of the area for agriculture, some former sugarcane fields in the vicinity have been converted to small-scale, diversified agriculture farms, cultivating a variety of vegetables, fruits, and herbs (see Section 3.1.1). Active farms are in the area between the H-1 Freeway and Farrington Highway on both east and west sides of the existing Palehua Road, and south of Farrington Highway to the east and west of the proposed North-South Road Corridor. These farms have short-term leases.
with the Estate of James Campbell (EJC) or the State’s Department of Land and Natural Resources (DLNR), the two major landowners in the area. Some actively farmed areas on the mauka side of H-1 Freeway rely on the Paliheu Road underpass for access, and some farm operations cross the proposed North-South Road ROW in the course of their operations. The agricultural stakeholders in the project vicinity, in addition to the landowners, include Hooker G. Livestock (ranching), Sugarland Farms, Inc., Atoum Farms, Inc., and A.M. Enterprise, Inc. Figure 3.2-3 shows the location of these tenants. Remaining agricultural lands near the North-South Road Corridor and the section of Kapolei Parkway between Renton Road and North-South Road are fallow or not active. Grace Pacific Corporation is a non-agricultural tenant of EJC in the area mauka of H-1 Freeway, and is discussed further in Section 3.4.

3.2.2 POTENTIAL IMPACTS

In the near future, much of the Ewa Plain would be changed from Agriculture to Urban State land use classifications, and would likely be re-zoned for urban uses, due to planned future developments (see Section 3.1). There are no State of Hawaii plans for diversified agriculture in Ewa; the Ewa DP does not recommend long-term use of the Ewa Plain for agriculture, except at selected locations, none of which would be on or near North-South Road.

Construction of the portion of Kapolei Parkway between North-South Road and Renton Road under the No-Build Alternative would affect approximately ten acres of City-owned vacant land currently zoned as restricted agriculture (AG-1). Other future roadway projects may also have little to no impact on active farms. Although the area affected is classified as “prime” agricultural land according to the ALISH system, the Ewa Plain is largely slated for urbanization, including the area surrounding the portion Kapolei Parkway. The City has had plans to urbanize this area, and DHHIL has expressed an interest in developing homesteads on this land (see Section 3.1).

Similarly, under the Build Alternative, North-South Road would convert roughly 190 acres of “prime,” AG-1 land, again not slated for long-term agricultural use. However, unlike the land surrounding the portion of Kapolei Parkway, some of this acreage is actively cultivated. Short-term lessees on State and EJC property would be affected by the North-South Road Corridor as described in Section 3.1.1.3.

On June 24, 2004, a meeting was held with some of the affected farmers to discuss potential interactions of the proposed project with EJC tenant operations. They expressed concern about potential damage to irrigation systems, and access between fields, in particular the area around Paliheu Road and the H-1 Freeway.

During construction, irrigation lines associated with farming activities will be maintained and/or replaced with minimal disruption. During the interim phase, Paliheu Road, and its underpass at the H-1 Freeway will be maintained, and will be available for vehicle access by tenants mauka of the H-1 Freeway, and, in the ultimate phase, North-South Road mauka of Farrington Highway and its interchange with the H-1 Freeway will displace Paliheu Road and its underpass with the H-1 Freeway. Farm vehicles will be
allowed access on North-South Road mauka of Farrington Highway, and they will be
provided access to agricultural fields on the mauka side of the freeway via the new
North-South Road. Crossings of North-South Road by unlicensed agricultural vehicles
will also be allowed, although time and location restrictions may be specified. Access
for farm vehicles will be maintained during and after construction.

As stated above, there are no State of Hawaii or City plans for diversified agriculture in
Ewa. The Ewa region is planned for substantial urbanization, including residences, com-
mercial establishments, institutions, parks, and recreational resources. Urban
development is normally incompatible with agriculture. Therefore, agriculture in Ewa is
not viable in the long-run, except at limited specified locations, or as a means to
preserve open space or urban buffers. For example, the Ewa DP recommends that
diversified agriculture be protected on lands on the other side of the Urban Growth
Boundary, north of the H-1 Freeway and west of Kunia Road.

Since the area affected by the project is classified as “prime agricultural” according to
ALISH, the requirements of the federal Farmland Protection Policy Act (FPPA) apply.
FPPA requires the federal agency to identify and consider the adverse effects of their
programs on the preservation of farmland; consider alternative actions that could lessen
adverse effects; and ensure that their programs, to the extent practicable, are
compatible with State, local government, and private programs and policies to protect
farmland. Per FPPA regulations (7 CFR 658), a Form NRCS-CPA-106, “Farmland
Conversion Impact Rating,” was submitted to the Natural Resources Conservation
Service (NRCS) for a score on “relative value of farmland to be converted”. FHWA
completed the form by calculating a site assessment score. If this combined score
(Land Evaluation and Site Assessment) equals or is greater than 160 points, alternatives
that avoid farmland impacts must be evaluated. The combined score for North-South
Road and the proposed portion of Kapolei Parkway between Renton Road and North-
South Road is 149, which is below this threshold. Correspondence with NRCS and the
FPPA form are included in Appendix A.

3.2.3 MITIGATION MEASURES

ROW acquisition, as discussed in Section 3.1 will be coordinated with the landowners
and tenant farmers so that crop damage does not occur. Farmers will be asked to
harvest crops on affected lands before construction begins. Land owners will be
compensated in accordance with the Uniform Relocation Assistance and Real Property
Acquisition Policies Act of 1970, as amended (See Section 3.1).

The following measures will be applied during the construction and operational phases
to ensure that agricultural fields remain active and productive, at least in the short-term,
until this area is converted to urban land uses:

- Existing unlicensed agricultural vehicle crossings of North-South Road will be
  maintained during construction. Time and location restrictions may apply.
- Access between mauka and makai areas in the vicinity of Pahoea Road will be
  maintained during construction. Also, in the operational phase, unlicensed
agricultural vehicles will be allowed on Paliwai Road (during the interim phase) and on North-South Road (during the ultimate phase) to cross from the mauka to the makai side of H-1 Freeway. Time restrictions may be implemented for such travel/crossings.

- Irrigation lines within the project ROW will be maintained or relocated.
- Security will be provided during construction to prevent trespassing (construction phase only).

3.3 INFRASTRUCTURE

3.3.1 TRANSPORTATION

3.3.1.1 EXISTING CONDITIONS

3.3.1.1a Roadway System

The major east-west highways in the Ewa Plain of Oahu parallel the coastline and provide regional mobility and access for traffic oriented to and from the Primary Urban Center, which includes downtown Honolulu. The major roadways oriented in the mauka-makai or north-south direction provide the communities within the Ewa Plain access to the regional east-west roadways and also provide mauka-makai sub-regional mobility. In the vicinity of the North-South Road project, Interstate Route H-1 (H-1 Freeway) and Farrington Highway are the major west-east (Waianae-Koko Head) facilities. Kalaeloa Boulevard, Fort Barrette Road/Makakilo Drive, and Kunia Road/Fort Weaver Road are the major north-south (mauka-makai) facilities.

Figure 3.1-1 shows the existing roadway network in this area.

H-1 Freeway

H-1 Freeway is the primary facility connecting west Oahu with the Primary Urban Center (PUC). The western terminus of the H-1 Freeway is in the Ewa Plain at the Palailat Interchange where it merges into Farrington Highway, and the eastern terminus of H-1 Freeway is in east Honolulu where it merges into Kalanianaole Highway. Within the study area H-1 Freeway is a six-lane freeway with room to expand to an eight-lane facility. Access to H-1 Freeway occurs at the Makakilo Interchange and at the Kunia Interchange.

H-1 Freeway is posted at 60 miles per hour (mph) between the Kunia Interchange and the Makakilo Interchange. East of the Kunia Interchange and west of the Makakilo Interchange, the posted speed limit is 55 mph.

Farrington Highway

Farrington Highway is a major arterial roadway providing east-west regional and sub-regional mobility. Its eastern terminus is just east of the Waialua Interchange in Pearl
City where it merges with Kamehameha Highway continuing east to Kailani on the fringe of downtown Honolulu. Within the study area, Farrington Highway is mostly a two-lane, undivided roadway. West of the Kapolei Golf Course Driveway adjacent of the Villages of Kapolei and through the City of Kapolei, it is a four-lane, divided highway with curb, gutter and sidewalks with painted median. It becomes a four-lane, mostly undivided roadway after merging with H-1 Freeway. To the east, between the Fort Weaver Road and Pearl City, Farrington Highway is four-lane divided roadway. The posted speed limit is 35 mph between Fort Weaver Road and the Kapolei Golf Course Access, transitioning to 25 mph adjacent to the Villages of Kapolei and through the City of Kapolei. At the merge with H-1 Freeway, the posted speed increases to 45 mph.

**Fort Weaver Road/Kunia Road**

Currently, Fort Weaver Road/Kunia Road is the principal north-south arterial roadway serving the communities of Ewa and Ewa Beach. It provides these communities access to Farrington Highway and H-1 Freeway. This facility is named Fort Weaver Road south of Farrington Highway and Kunia Road north of Farrington Highway. Fort Weaver Road begins as a two-lane, undivided roadway at the entrance to the Iroquois Point Naval Housing, growing to a four-lane, divided roadway between North Road and Farrington Highway. Kunia Road is a six-lane expressway between Farrington Highway and H-1 Freeway and continues north of H-1 Freeway as a four-lane, divided roadway to the Royal Kunia development.

**Fort Barrette Road/Makakilo Drive**

Fort Barrette Road is a major north-south arterial, providing access to H-1 Freeway and Farrington Highway for the Villages of Kapolei, City of Kapolei, and Kalaeloa areas. North of Farrington Highway, Fort Barrette Road becomes Makakilo Drive, which provides access to the Makakilo community. South of Farrington Highway, Fort Barrette Road continues until it merges with Enterprise Avenue just south of F.D. Roosevelt Avenue in Kalaeloa. Fort Barrette Road is a two-lane, undivided roadway with a rural cross section south of Farrington Highway. Makakilo Drive is a four-lane, divided roadway with an urban cross section including curb and gutter. The posted speed limit is 40 mph.

**Kapolei Parkway**

Kapolei Parkway is a partially constructed arterial roadway. It is configured as a four-lane, divided roadway between Launanihele Street and the Oahu Railway and Land Company (OR&L) ROW within the Ewa Gentry Development. The cross section of this facility has enough width to be configured as a six-lane, divided roadway when warranted. A part of Kapolei Parkway is also constructed within the Ocean Pointe Development as a four-lane undivided roadway. Within the Villages of Kapolei community, Kapolei Parkway is constructed as a six-lane, divided roadway between Fort Barrette Road and the drainage channel located east of the Kapolei Middle School. The posted speed limit is 30 mph and on-street parking is prohibited along most of Kapolei Parkway.
Kapolei Parkway between Renton Road and North-South Road would have an ultimate six-lane cross section, landscaped median and sidewalks on both sides. In the future, Kapolei Parkway would provide north-south mobility in the Ewa area and east-west mobility in the Kapolei area.

3.3.1.1b Traffic Conditions

Existing traffic conditions were inventoried and summarized within an area defined by the H-1 Freeway to the north, Fort Weaver Road/Kunia Road to the east, Fort Barrette Road/Makakilo Drive to the west, and Kapolei Parkway to the south. The Kapolei Parkway/Renton Road and Fort Weaver Road/Renton Road intersections are also included. Roadway analyses identify existing operations and establish a basis for comparison with future No-Build and Build scenarios.

Existing Traffic Volumes

Manual traffic turning movement counts were conducted from 2001 through 2002 during commuter peak periods. Counts were conducted at the ramp terminal intersections at the Kunia and Makakilo Interchanges and at major intersections along the Fort Weaver Road and Fort Barrette Road corridors.

24-hour traffic volume data collected by the State of Hawaii Department of Transportation (HDOT) at their traffic count stations were obtained and reviewed. Table 3.3-1 lists these count stations and their respective locations. These data were augmented by 24-hour traffic volume data gathered by the project consultant.

Table 3.3-1:
HDOT Count Stations

<table>
<thead>
<tr>
<th>Count Station</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-10-L</td>
<td>Makakilo Dr. 0.1 Mile Northwest of H-1 Freeway Underpass</td>
</tr>
<tr>
<td>11-M</td>
<td>Intersection of Fort Barrette Rd. and Makakilo Dr. at Farrington Highway</td>
</tr>
<tr>
<td>C-10-W</td>
<td>Fort Weaver Road North of Laaulumua Street</td>
</tr>
<tr>
<td>C-10-K</td>
<td>H-1 Freeway 1.97 Miles West of Kunia Road</td>
</tr>
<tr>
<td>H-8-AA</td>
<td>H-1 Freeway 0.45 Mile East of Walkele Bridge</td>
</tr>
<tr>
<td>H-8-A</td>
<td>H-1 Freeway at Walkele Bridge</td>
</tr>
<tr>
<td>76-S</td>
<td>Ramp Volumes at the Fort Weaver Rd./Farrington Hwy. Interchange</td>
</tr>
<tr>
<td>H-1-2</td>
<td>Ramp Volumes at the Makakilo Interchange</td>
</tr>
<tr>
<td>H-1-5</td>
<td>Ramp Volumes at the Kunia Interchange</td>
</tr>
</tbody>
</table>

Source: Hawaii State Department of Transportation, Traffic Survey Data (Individual Stations), 2001

For the purposes of this study, data from 2001 and 2002 were considered the "existing" condition. The existing morning (A.M.) and afternoon (P.M.) peak hour volumes are illustrated in Figure 3.3-1.
Existing Interchange Configurations

Current interchange plans for the Kūnia, Makākilo, and Farrington Highway/Fort Weaver Road Interchanges were obtained from the HDOT. The plans were used to verify interchange configurations including interchange ramp terminal lane geometry and left-turn lane storage lengths.

The Kūnia Interchange has been substantially modified in recent years into a high-capacity interchange. During the A.M. peak hour, traffic flow oriented to the east is considerable with over 3,000 vehicles per hour (vph) entering the H-1 Freeway. Double left-turn lanes are provided for the southbound to eastbound movement at the south ramp terminal intersection. Traffic executing this movement must merge from two lanes to one lane on the eastbound on-ramp, but the remaining lane enters H-1 Freeway without merging. Northbound traffic on Kūnia Road also turns onto the eastbound on-ramp in two lanes. These two lanes do not merge with the southbound to eastbound traffic on the ramp. During the A.M. peak period, both lanes enter H-1 Freeway without merging with one lane becoming the normal outside lane and the other lane becoming the A.M. only shoulder lane. This configuration allows for three streams of traffic to simultaneously enter eastbound H-1 Freeway during the A.M. peak period. To allow this configuration to operate, one of the eastbound through lanes between the Makākilo and Kūnia Interchanges terminates into the eastbound off-ramp at Kūnia Interchange.

During the P.M. peak hour, the peak direction of flow reverses and the westbound off-ramps handle about 2,800 vph. A two-lane loop ramp provides for the more major westbound to makai-bound traffic movement. Both loop ramp lanes enter southbound Kūnia Road without merging. The westbound to northbound traffic movement is accommodated through a "free right" at the ramp terminal intersection, allowing vehicles to turn onto northbound Kūnia without stopping.

The Makākilo Interchange is configured with ramps oriented to and from the east. Currently, traffic cannot directly enter or exit H-1 Freeway to the west of the Makākilo Interchange. This interchange has also been modified in recent years to improve its capacity to handle traffic. During the A.M. peak hour, traffic oriented to the east totals almost 1,600 vph with traffic from north of the interchange and traffic from the south of the interchange about evenly split. The traffic from north of the interchange utilize a loop ramp to enter eastbound H-1 Freeway while traffic from the south of the interchange enter eastbound H-1 Freeway via a ramp that merges with the H-1 Freeway immediately after the loop ramp merge. Previously, during the P.M. peak hour lane geometry constraints at the Makākilo Interchange westbound off-ramp caused the off-ramp to queue onto the westbound H-1 Freeway lanes. About 2,300 vph exit at the Makākilo Interchange during the P.M. peak hour. Modifications to ramp geometry helped reduce the queuing, so that it no longer queues onto H-1 Freeway.

Figure 3.3-2 summarizes the existing roadway configurations of the interchanges, roadways and intersections within the study area.
Freeway and Highway Level-of-Service

Roadway segment level-of-service was evaluated for segments of roadway with relatively uninterrupted traffic flow such as H-1 Freeway between interchanges, Farrington Highway between Fort Weaver Road and the Villages of Kapolei area, and Fort Weaver Road as it crosses Farrington Highway. Methodologies documented in the 2000 Highway Capacity Manual (HCM) were used for these evaluations. Operating conditions are expressed as levels-of-service (LOS) with letter designations from A to F, representing free-flow to over-capacity conditions. The LOS index indicates the roadway segment’s ability to accommodate the traffic demand placed on it during the A.M. and P.M. peak periods. Figure 3.3-3 summarizes the existing A.M. and P.M. peak period roadway segment LOS.

H-1 Freeway

H-1 Freeway segments were evaluated starting east of the Kunia Interchange to west of the Makakilo Interchange. Table 3.3-2 summarizes the freeway LOS within the study area.

Table 3.3-2: Existing (2001) H-1 Freeway Level-of-Service

<table>
<thead>
<tr>
<th>Freeway Segment</th>
<th>Lanes A.M.(P.M.)</th>
<th>Direction</th>
<th>Existing LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A.M. Peak</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOS Density</td>
</tr>
<tr>
<td>Paiwa IC - Kunia IC</td>
<td>5 (5)</td>
<td>WB</td>
<td>14.9</td>
</tr>
<tr>
<td>Kunia IC - Makakilo IC</td>
<td>4 (4)</td>
<td>WB</td>
<td>13.4</td>
</tr>
<tr>
<td>Makakilo IC - Palailai IC</td>
<td>3 (3)</td>
<td>WB</td>
<td>8.3</td>
</tr>
<tr>
<td>Palailai IC - Makekilo IC</td>
<td>3 (3)</td>
<td>EB</td>
<td>7.6</td>
</tr>
<tr>
<td>Makakilo IC - Kunia IC</td>
<td>4 (4)</td>
<td>EB</td>
<td>16.9</td>
</tr>
<tr>
<td>Kunia IC - Paiwa IC</td>
<td>6 (5)</td>
<td>EB</td>
<td>35.0</td>
</tr>
</tbody>
</table>

WB = westbound, EB = eastbound
*Caused by downstream congestion
Source: 2001 HCTOT Traffic Counts

Analysis of the H-1 Freeway within the study area indicates it operates well, LOS C or better for most segments, during the A.M. and P.M. peak periods. Field observations identified some operational friction with the eastbound lane drop into the Kunia off-ramp. Drivers traveling in the eastbound makai lane merge with the through lanes at the very last-minute causing vehicles in the through lane to slow down and affecting this segment. Traffic originating west of the Kunia Interchange also experience delays as they travel east of the Kunia Interchange due to downstream congestion and the effect of drivers getting on at the Kunia Interchange and merging to the left-lane to get into the zipper lane.
Farrington Highway

Farrington Highway west of Fort Weaver Road to the Kapolei Golf Course Access operates close to uninterrupted mode. Field observations of this segment of roadway during the A.M. and P.M. peak hours indicate that, on the average, Farrington Highway operates well even during the peak periods.

Fort Weaver Road

Analysis revealed that this segment of Fort Weaver Road in the northbound direction is affected by downstream congestion during the A.M. peak hour. Manual counts indicate that approximately 75 percent of the northbound vehicles at the Fort Weaver Road/Farrington Highway Interchange access the H-1 Freeway via the eastbound on-ramp at the Kualoa Interchange. Fort Weaver Road also processes very large traffic volumes during the P.M. peak period in the southbound direction. Both observations indicate that Fort Weaver Road is constrained in its ability to handle additional traffic growth.

Interchange Ramp Merge-Diverge Level-of-Service

Freeway ramps of the following interchanges are located within the study area:

- Kunia Interchange
- Makakilo Interchange
- Fort Weaver Interchange

Levels-of-service for ramp merge-diverge operation were evaluated using the methodologies outlined in the HCM. Table 3.3-3 summarizes the interchange ramp LOS. As shown in Table 3.3-3, all interchange ramps operate at an acceptable LOS (LOS D or better). Recent geometric improvements allow the interchange to operate at the acceptable level-of-service.

Kunia Interchange

As a result of the recent improvements to the Kunia Interchange, the eastbound on-ramp is configured to provide independent lane additions for southbound Kunia to eastbound H-1 and northbound Kunia to eastbound H-1 Freeway traffic. The lane additions eliminate the need for these traffic streams to merge with H-1 Freeway through traffic, and as a result, the eastbound on-ramp operates acceptably (LOS D or better) for peak period conditions. The addition of an A.M. peak period only shoulder lane helps to accommodate traffic. Field observations indicate that very few vehicles utilize the shoulder lane, possibly due to this lane's poor roadway condition and its narrow width. Additionally, the shoulder lane is discontinuous, reducing its effectiveness.

During the P.M. peak period, improvements that implemented a free-flow right turn for the westbound H-1 Freeway to northbound Kunia Road traffic and enhanced the loop ramp for westbound H-1 Freeway to southbound Kunia Road traffic allow these ramps to
operate well (LOS C or better) during peak operations. Other ramps also operate well (LOS C or better) during peak period operations.

Table 3.3-3:
Existing (2001) Ramp Merge-Diverge Level-of-Service

<table>
<thead>
<tr>
<th>Interchange</th>
<th>A.M.</th>
<th>P.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOS</td>
<td>Density</td>
</tr>
<tr>
<td>Kunia Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB Kunia Off-Ramp Diverge</td>
<td>A</td>
<td>4.4</td>
</tr>
<tr>
<td>WB Ewa Off-Ramp Diverge</td>
<td>B</td>
<td>14.6</td>
</tr>
<tr>
<td>WB Kunia On-Ramp Merge</td>
<td>B</td>
<td>15.5</td>
</tr>
<tr>
<td>EB Off-Ramp-Lane Drop</td>
<td>C</td>
<td>11.4</td>
</tr>
<tr>
<td>EB On-Ramp-Lane Add</td>
<td>D</td>
<td>30.4</td>
</tr>
<tr>
<td>Makakilo Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EB Makakilo On-Ramp Merge</td>
<td>B</td>
<td>17.0</td>
</tr>
<tr>
<td>EB Kapolei On-Ramp Merge</td>
<td>C</td>
<td>21.5</td>
</tr>
<tr>
<td>WB Off-Ramp Diverge</td>
<td>A</td>
<td>9.3</td>
</tr>
<tr>
<td>Fort Weaver Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NB Off-Ramp Diverge</td>
<td>C</td>
<td>25.3</td>
</tr>
<tr>
<td>NB On-Ramp Lane Add</td>
<td>E*</td>
<td>36.5</td>
</tr>
<tr>
<td>SB Off-Ramp Lane Drop to WB</td>
<td>A</td>
<td>2.7</td>
</tr>
<tr>
<td>SB Off-Ramp Diverge to EB</td>
<td>B</td>
<td>13.2</td>
</tr>
<tr>
<td>SB On-Ramp Merge</td>
<td>B</td>
<td>13.5</td>
</tr>
<tr>
<td>NB Kunia/H-1 Weave</td>
<td>E</td>
<td>36.5</td>
</tr>
</tbody>
</table>

*Caused by downstream congestion
Source: 2001 HDOT Traffic Counts

Makakilo Interchange
Recent modifications to the Makakilo Interchange improved traffic operations. Previously, the westbound off-ramp operated in very congested mode during the P.M. peak hour. Congestion at the ramp terminal intersection created a queue that extended onto the H-1 Freeway, creating a safety hazard. The westbound off-ramp was lengthened and channelization at the ramp terminal intersection was improved. Lane balance was provided at the freeway exit, and the off-ramp now operates well during the peak periods. The on-ramps were also improved and the merge LOS during the A.M. peak hour is good.

Fort Weaver Interchange
Congestion on Kunia Road between the Kunia Interchange eastbound on-ramp and the Fort Weaver Interchange northbound on-ramp during the A.M. peak hour affects northbound traffic in this area. Approximately 75 percent of the traffic originating from Ewa and Ewa Beach during the A.M. peak period access H-1 Freeway via the Kunia
Interchange eastbound on-ramp. Northbound traffic originating from Waipahu and destined for westbound H-1 or northbound Kunia Road must execute a type B weave (vehicles originating from the Fort Weaver Interchange northbound onramp destined for northbound Kunia Road must complete a lane change, whereas other vehicles originating from Ewa and Ewa Beach destined for eastbound H-1 Freeway do not have to execute a lane change). Approximately 60 percent of the traffic originating from Waipahu executes a type B weave during the A.M. peak period. Furthermore, the two southbound to eastbound left-turning movements are required to merge into a single lane on the on-ramp prior to entering the H-1 Freeway. Vehicles in the right lane of the on-ramp, which comprise approximately 70 percent of the total ramp traffic, tend to merge left as they enter the H-1 Freeway, despite the fact that a shoulder lane is provided for these drivers. During the P.M. peak hour, downstream congestion at the Fort Weaver Road and Lualauwui Street intersection affects the merge operation of the southbound on-ramp (LOS E), resulting in queuing on the ramp. The resultant queue has been observed to extend back to the Fort Weaver Road Interchange ramp junction. Other ramps of this interchange operate acceptably (LOS D or better) during all peak hours.

**Intersection Level-of-Service**

The signalized interchange terminals and adjacent intersections located within the study area were analyzed using the methodologies outlined in the HCM. LOS is shown for signalized intersections in terms of overall intersection operation. The levels-of-service for unsignalized intersections are expressed for each lane of minor streets and left-turn lanes for major streets. LOS definitions are provided in Appendix D. Table 3.3-4 summarizes the existing LOS for interchange terminals within the study area. Table 3.3-5 summarizes the adjacent intersections LOS within the study area. As shown in Table 3.3-4 the south terminal at Kunia Interchange is congested during peak operations. As shown in Table 3.3-5, the adjacent intersections are also congested during peak period operations (LOS F).

**Makakilo Interchange North Ramp Terminal Intersection**

During the morning peak hour, all turning movements onto Makakilo Drive operate acceptably at LOS D or better. Field observations indicate that the ability to process vehicles at the north terminal is hindered due to the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection. During the P.M. peak hour, the queue at that intersection can extend north to the north terminal at Makakilo Interchange.

**Kunia Interchange North Ramp Terminal Intersection**

As earlier stated, recent modifications to the Kunia Interchange provided a "free right" at the end of the westbound to northbound off-ramp, allowing this movement to operate well during both the morning and afternoon peak hours. The northbound left-turn movement operates acceptably (LOS C) during the P.M. peak hour. Some delay at the north terminal is experienced because of a high volume of vehicles destined for
eastbound H-1 Freeway but this movement is regulated as a result of the traffic signal at Kupuna Loop north of the terminal.

Table 3.3-4:
Existing Interchange Terminal Level-of-Service

<table>
<thead>
<tr>
<th>Interchange Terminals</th>
<th>A.M. LOS</th>
<th>A.M. Density</th>
<th>P.M. LOS</th>
<th>P.M. Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kunia Interchange</td>
<td>110 sec cycle</td>
<td>110 sec cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-1 EB On-Ramp/</td>
<td>C</td>
<td>33.2</td>
<td>C</td>
<td>27.7</td>
</tr>
<tr>
<td>Kunia Road</td>
<td>E</td>
<td>67.2</td>
<td>E</td>
<td>62.6</td>
</tr>
<tr>
<td>NB Through</td>
<td>D</td>
<td>41.6</td>
<td>D</td>
<td>40.1</td>
</tr>
<tr>
<td>SB Left Turn</td>
<td>E</td>
<td>60.4</td>
<td>D</td>
<td>44.9</td>
</tr>
<tr>
<td>SB Through</td>
<td>A</td>
<td>9.6</td>
<td>B</td>
<td>18.4</td>
</tr>
<tr>
<td>H-1 WB On-Ramp/</td>
<td>Unsignalized</td>
<td>Unsignalized</td>
<td>Unsignalized</td>
<td>Unsignalized</td>
</tr>
<tr>
<td>Kunia Road</td>
<td>B</td>
<td>13.9</td>
<td>C</td>
<td>21.0</td>
</tr>
<tr>
<td>NB Left Turn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makakilo Interchange</td>
<td>60 sec cycle</td>
<td>60 sec cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-1 WB Off-ramp/</td>
<td>C</td>
<td>27.2</td>
<td>B</td>
<td>13.6</td>
</tr>
<tr>
<td>Makakilo Road</td>
<td>A</td>
<td>6.3</td>
<td>A</td>
<td>6.7</td>
</tr>
<tr>
<td>WB Approach</td>
<td>B</td>
<td>18.7</td>
<td>C</td>
<td>23.1</td>
</tr>
<tr>
<td>NB Through</td>
<td>D</td>
<td>54.4</td>
<td>C</td>
<td>21.0</td>
</tr>
<tr>
<td>SB Through</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Weaver Interchange</td>
<td>60 sec cycle</td>
<td>60 sec cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farrington SB On-Ramp/</td>
<td>B</td>
<td>13.1</td>
<td>B</td>
<td>13.9</td>
</tr>
<tr>
<td>Fort Weaver Road</td>
<td>A</td>
<td>5.2</td>
<td>A</td>
<td>9.7</td>
</tr>
<tr>
<td>EB Through</td>
<td>C</td>
<td>20.8</td>
<td>B</td>
<td>15.9</td>
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<td>WB Left-Turn</td>
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<td>8.5</td>
<td>B</td>
<td>12.8</td>
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<td>Farrington NB On-Ramp/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Weaver Road</td>
<td>B</td>
<td>17.7</td>
<td>B</td>
<td>10.9</td>
</tr>
<tr>
<td>EB Left-Turn</td>
<td>A</td>
<td>5.5</td>
<td>B</td>
<td>13.0</td>
</tr>
<tr>
<td>WB Through</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WB=westbound, EB=eastbound, NB=northbound, SB=southbound
### Table 3.3-5:
Existing (2001) Adjacent Intersections Level-of-Service

<table>
<thead>
<tr>
<th>Intersection</th>
<th>A.M.</th>
<th>P.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOS</td>
<td>Delay</td>
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<tr>
<td><strong>Farrington Hwy and Makakilo Dr/Fort Barrette Rd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound</td>
<td>E</td>
<td>60.2</td>
</tr>
<tr>
<td>Westbound</td>
<td>C</td>
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</tr>
<tr>
<td>Northbound</td>
<td>E</td>
<td>61.9</td>
</tr>
<tr>
<td>Southbound</td>
<td>E</td>
<td>71.7</td>
</tr>
<tr>
<td><strong>Ft Weaver Rd and Laulaunui St</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound</td>
<td>D</td>
<td>49.4</td>
</tr>
<tr>
<td>Westbound</td>
<td>E</td>
<td>98.3</td>
</tr>
<tr>
<td>Northbound</td>
<td>E</td>
<td>105.3</td>
</tr>
<tr>
<td>Southbound</td>
<td>F</td>
<td>58.7</td>
</tr>
<tr>
<td><strong>Ft Weaver Rd and Aawa Dr</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound</td>
<td>E</td>
<td>56.3</td>
</tr>
<tr>
<td>Westbound</td>
<td>F</td>
<td>85.1</td>
</tr>
<tr>
<td>Northbound</td>
<td>F</td>
<td>164</td>
</tr>
<tr>
<td>Southbound</td>
<td>E</td>
<td>17.1</td>
</tr>
<tr>
<td><strong>Ft Weaver Rd and Renton Rd</strong></td>
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<tr>
<td>Eastbound</td>
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<td>80.2</td>
</tr>
<tr>
<td>Westbound</td>
<td>F</td>
<td>225.5</td>
</tr>
<tr>
<td>Northbound</td>
<td>F</td>
<td>107.7</td>
</tr>
<tr>
<td>Southbound</td>
<td>E</td>
<td>69.9</td>
</tr>
<tr>
<td><strong>Ft Weaver Rd and Kolowaka Dr</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound</td>
<td>D</td>
<td>58.3</td>
</tr>
<tr>
<td>Westbound</td>
<td>F</td>
<td>95.9</td>
</tr>
<tr>
<td>Northbound</td>
<td>F</td>
<td>203.5</td>
</tr>
<tr>
<td>Southbound</td>
<td>E</td>
<td>69.9</td>
</tr>
<tr>
<td><strong>Ft Weaver Rd and Geiger Rd</strong></td>
<td></td>
<td></td>
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<td>Eastbound</td>
<td>D</td>
<td>84.8</td>
</tr>
<tr>
<td>Westbound</td>
<td>D</td>
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<td>163.6</td>
</tr>
<tr>
<td>Southbound</td>
<td>E</td>
<td>71.4</td>
</tr>
</tbody>
</table>

Source: 2001 HDOT Traffic Counts
* LOS manually adjusted to account for downstream congestion and reflect existing conditions.
Kunia Interchange South Ramp Terminal Intersection

The south ramp terminal intersection operates at LOS C during both the morning and afternoon peak hours. However, the results also show that individual movements within the intersection operate under congested conditions. These movements include the southbound to eastbound left-turns during the A.M. peak hour and the eastbound to northbound left-turns during both the A.M. and P.M. peak hours.

Fort Weaver Interchange East Ramp Terminal Intersection

The east ramp terminal intersection at the Fort Weaver Interchange operates acceptably at LOS B or better, with little delay during the morning and afternoon peak hours.

Fort Weaver Interchange West Ramp Terminal Intersection

Traffic operations at the west ramp terminal intersection of the Fort Weaver Road Interchange operates acceptably, with all turning movements experiencing little delay during both the A.M. and P.M. peak hours (LOS B and A, respectively). Adjacent intersections along the Fort Weaver Road corridor and Fort Barrette Road and Farrington Highway intersection were analyzed. Table 3.3-5 summarizes intersection LOS of key intersections along the Fort Weaver Road corridor. As shown, the Fort Weaver Road corridor is congested during the A.M. peak period. Through traffic volumes on Fort Weaver Road exceed its capacity. Long cycle lengths are used to maximize through traffic flow on Fort Weaver Road, but this results in long side street queue lengths and delays. Travel time runs in the corridor have shown delays approaching 14 minutes for northbound traffic. Future plans call for Fort Weaver Road to be widened from four to six lanes in the near future, in an effort to accommodate existing and projected traffic.

Makakilo Drive/Fort Barrette Road/Farrington Highway

Table 3.3-5 summarizes the intersection operations for the Fort Barrette Road/Makakilo Drive/Farrington Highway intersection. This intersection serves as a gateway to the City of Kapolei and to H-1 Freeway. It, therefore, is congested during both A.M. and P.M. peak hours (overall LOS E and D, respectively). As shown, key movements at the Fort Barrette Road/Farrington Highway intersection operate at LOS E. Long cycle lengths contribute to delays experienced at this intersection. A contributing factor to the heavy congestion is that Farrington Highway is the only east-west roadway in Kapolei. All traffic destined for Kapolei must enter the Fort Barrette Road/Makakilo Drive and Farrington Highway intersection.

A large portion of the green time is allotted to the eastbound to northbound left-turn movement. This results in long delays and queues on the other three approaches. Though a large portion of the green time is allotted to the eastbound to northbound left-turn movement, traffic wanting to complete this movement is hindered by the two traffic signals on Farrington Highway accessing Kapolei Shopping Center to the west of Fort Barrette Road, often holding back vehicles along the Farrington Highway corridor.
There is a considerable amount of traffic headed into Kapolei during both A.M. and P.M. peak periods and out of Kapolei during the P.M. peak. Field observations have shown that during the A.M. peak, the queue in the northbound to westbound left-turn movement can extend past the left-turn storage lane and into the through lanes blocking all northbound traffic. A large portion of the southbound traffic makes a right-turn onto Farrington Highway during both A.M. and P.M. peak periods. This movement is aided by the eastbound left-turn movement allowing them to overlap and process additional vehicles. Although this movement is allowed to overlap with the eastbound left-turn movement, queues on the southbound approach have been observed to reach the north terminal at Makakilo Interchange affecting its ability to process vehicles.

**Summary of Results**

Figure 3.3-3 illustrates the existing level-of-service for the roadways, freeways and interchanges within the study area.

The following issues were identified in the analyses of existing conditions:

- Recent westbound ramp modifications at the Kunia and Makakilo Interchange have improved traffic operations at each respective off ramp.
- The Kunia Interchange eastbound off ramp has been observed to queue to the top of the H-1 Freeway gorge.
- Fort Weaver Road has been observed to experience high travel time delays during both the A.M. and P.M. peak periods.
- Fort Barrette Road experiences high delays during the A.M. and P.M. peak periods and have been observed to affect the queue of adjacent intersection operations.

Recent interchange improvements to the Kunia Interchange and the Makakilo Interchange have helped alleviate congestion during the morning and afternoon peak commuter periods. Most improvements have already occurred and although the interchanges are now operating acceptably, both accesses from the arterial system to the Kunia Interchange and the Makakilo Interchange are operating at or over capacity. Currently, the weave section in the northbound direction between Fort Weaver Interchange and Kunia Interchange and selected movements at the south terminal at Kunia Interchange operate at a LOS E. Field observations have shown an increase in travel time for the eastbound through movement prior to the Kunia Interchange and a queue extending from the bottom of the eastbound off-ramp to the top of the H-1 Freeway gorge.

Makakilo Interchange operates acceptably but is affected by the Farrington Highway and Fort Barrette Road/Makakilo Drive Intersection queue extending north to the north interchange terminal.

Adjacent intersections along the Fort Barrette Road and Fort Weaver Road Corridor experience severe congestion during both morning and afternoon peak periods. Delays of up to 14 minutes and the cross-streets experiencing considerable delays due to a large portion of the green time allotted to the northbound through movement have been
observed along Fort Weaver Road. Because Farrington Highway is the only east-west roadway in Kapolei, all traffic entering Kapolei must enter the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection resulting in delays at the north, south and westbound approaches.

### 3.3.1.1c Public Transit

The City and County of Honolulu operates an island-wide public bus transit system called TheBus. This system is a fixed-route, regularly scheduled public transit service operated by Oahu Transi Services (OTS), and is the backbone of basic transit services for the island of Oahu. In addition, the City provides transit services for semi-ambulatory and non-ambulatory persons with disabilities called TheHandi-Van.

With a fleet of 525 buses, TheBus provides 86 numbered bus routes and over 120 subroutes. The system carries over 70 million passengers annually. Figure 3.3-4 illustrates the existing public transit routes within the Ewa region. A full-range of transit service is provided for the Ewa Plain. Express buses provide peak hour commuter service to both Downtown and Waikiki. There is also skip-stop and regular trunk service along the major arterials with circulator bus service providing access to the neighborhoods.

### 3.3.1.2 METHODOLOGY AND POTENTIAL IMPACTS

A detailed discussion of the traffic impacts of the proposed project is found in Appendix D, Traffic Study for the North-South Road and Kapolei Parkway Project Environmental Assessment (April 2004). The following information is based on that report.

The traffic impacts of the No-Build and Build Alternatives were assessed for the Year 2025 and are consistent with the ORTP 2025 (April 2001). The analysis is comprised of two sections. The first section includes level-of-service analysis for the study intersections, roadway segments, and freeway ramp junctions. The second section includes freeway mainline and weaving analyses to determine whether the proposed project would create operating problems on the H-1 Freeway.

The current Oahu Metropolitan Planning Organization (OMPO) travel demand forecasting model was used as a basis for developing forecasts of future traffic volumes for the alternatives. The No-Build Alternative was used as the baseline condition and served as the basis of comparison for the Build Alternatives. Future traffic volumes maintained consistency with interim year forecasts such as the Ewa Master Plan Impact Fee Project.

Alternatives were evaluated using the operational methodology contained in the 2000 Highway Capacity Manual (HCM). Special Report 209 (Transportation Research Board, 2000). Freeway mainline analysis, freeway/expressway ramp merge/diverge analysis, and intersection LOS analysis for projected year 2025 conditions were conducted.
3.3.1.2a Projected Year 2025 Traffic Operations

Figures 3.3-5 and 3.3-6 illustrate the proposed lane configurations used in the analyses for the No-Build and Build Alternatives. Projected Year 2025 No-Build, and Build intersection, freeway, highway and ramp volumes are shown in Figures 3.3-7 and 3.3-8. Figures 3.3-9 and 3.3-10 summarizes the year 2025 No-Build and Build Alternatives projected peak hour traffic operations, respectively.

Freeway Operations

Table 3.3-6 summarizes the results of the freeway segment analysis.

Table 3.3-6: Year 2025 Freeway Segment Level-of-Service

<table>
<thead>
<tr>
<th>Freeway Segment</th>
<th>Lanes A.M. (P.M.)</th>
<th>Direction</th>
<th>A.M. Peak</th>
<th></th>
<th>P.M. Peak</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No-Build</td>
<td>Build</td>
<td>No-Build</td>
<td>Build</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOS Density</td>
<td>Density</td>
<td>LOS Density</td>
<td>Density</td>
</tr>
<tr>
<td>Paiwa IC - Kunia IC</td>
<td>5 (5)</td>
<td>WB</td>
<td>C 20.1</td>
<td>C 20.1</td>
<td>C 19.4</td>
<td>C 19.4</td>
</tr>
<tr>
<td>Kunia IC - North-South Rd IC</td>
<td>4 (4)</td>
<td>WB</td>
<td>C 18.4</td>
<td>C 22.5</td>
<td>B 15.6</td>
<td>B 17.3</td>
</tr>
<tr>
<td>North-South Rd IC - Makakilo IC</td>
<td>4 (4)</td>
<td>WB</td>
<td>- -</td>
<td>C 18.1</td>
<td>- -</td>
<td>B 15.2</td>
</tr>
<tr>
<td>Makakilo IC - Palatiai IC</td>
<td>3 (3)</td>
<td>WB</td>
<td>C 19.6</td>
<td>C 19.6</td>
<td>B 14.7</td>
<td>B 14.7</td>
</tr>
<tr>
<td>Palatiai IC - Makakilo IC</td>
<td>3 (3)</td>
<td>EB</td>
<td>D 28.0</td>
<td>D 28.0</td>
<td>B 11.7</td>
<td>B 11.7</td>
</tr>
<tr>
<td>Makakilo IC - North-South Rd IC</td>
<td>4 (4)</td>
<td>EB</td>
<td>D 26.3</td>
<td>C 25.6</td>
<td>B 13.0</td>
<td>B 11.5</td>
</tr>
<tr>
<td>North-South Rd IC</td>
<td>3 (3)</td>
<td>EB</td>
<td>- -</td>
<td>D 35.0</td>
<td>- -</td>
<td>B 12.9</td>
</tr>
<tr>
<td>North-South Rd IC - Kunia IC</td>
<td>4 (4)</td>
<td>EB</td>
<td>- -</td>
<td>D 33.8</td>
<td>- -</td>
<td>B 15.3</td>
</tr>
<tr>
<td>Kunia IC - Paiwa IC</td>
<td>6 (5)</td>
<td>EB</td>
<td>D 27.8</td>
<td>D 27.8</td>
<td>B 16.2</td>
<td>B 17.3</td>
</tr>
</tbody>
</table>

WB=westbound, EB=eastbound, NS=northbound, SB=southbound, IC=Interchange

As shown in Table 3.3-6, the H-1 Freeway is projected to operate acceptably for peak hour conditions with and without the North-South Road Interchange at LOS C or better at every segment except for the eastbound segments during the A.M. peak period which operate at LOS D. This can be explained by the typical heavy morning traffic headed east for either work or school.

With the addition of the North-South Road Interchange, the freeway density is slightly higher on the segment between the North-South Road Interchange and the Kunia Interchange, in both directions, than the density on that same segment in the No-Build scenario. More vehicles are on this segment because they are using the North-South Road Interchange over the Kunia Interchange to get to their destination. However, the LOS is the same for that segment in both Build and No-Build scenarios.

Copies of the analysis worksheets are included in Appendix D.
CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING
Freeway Merge-Diverge Operations

Table 3.3-7 summarizes the results of the Freeway Merge-Diverge analyses. The results of the ramp analysis show that there are several problem areas in the No-Build scenario, with certain ramps operating at LOS E and F. The eastbound on-ramp at the Kunia Interchange off of Kunia Road operates at LOS F during both the A.M. and P.M. peak periods and the weave between Kunia Interchange and Farrington Highway operates at LOS F during the A.M. peak period. Both of these conditions are caused by increased traffic coming out of the Ewa and East Kapolei areas.

<table>
<thead>
<tr>
<th>Intersection</th>
<th>A.M. Peak</th>
<th>P.M. Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Build</td>
<td>Build</td>
</tr>
<tr>
<td></td>
<td>LOS Density</td>
<td>LOS Density</td>
</tr>
<tr>
<td>Kunia Interchange</td>
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<td>EB Off-Ramp Diverge</td>
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<td>D 30.3</td>
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<td>C 24.7</td>
</tr>
<tr>
<td>EB On-Ramp Lane Add (from Ewa)</td>
<td>F 55.5</td>
<td>E 37.1</td>
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<td>WB Kunia Off-Ramp Diverge</td>
<td>A 9.6</td>
<td>A 9.6</td>
</tr>
<tr>
<td>WB Ewa Off-Ramp Diverge</td>
<td>C 22.5</td>
<td>C 21.3</td>
</tr>
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<td>WB On-Ramp Merge</td>
<td>B 17.2</td>
<td>B 19.8</td>
</tr>
<tr>
<td>North-South Interchange</td>
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<td></td>
</tr>
<tr>
<td>EB Off-Ramp Lane Drop</td>
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<td>-</td>
</tr>
<tr>
<td>EB On-Ramp Merge</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EB On-Ramp Lane Add</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WB Off-Ramp Diverge</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WB On-Ramp Merge</td>
<td>-</td>
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</tr>
<tr>
<td>Makakilo Interchange</td>
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</tr>
<tr>
<td>EB Off-Ramp Diverge</td>
<td>C 20.8</td>
<td>B 18.6</td>
</tr>
<tr>
<td>EB Makakilo On-Ramp Merge</td>
<td>C 20.2</td>
<td>B 18.6</td>
</tr>
<tr>
<td>EB Kapolei On-Ramp Merge</td>
<td>C 22.2</td>
<td>C 21.2</td>
</tr>
<tr>
<td>WB Off-Ramp Diverge</td>
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<td>A 1.2</td>
</tr>
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<td>WB On-Ramp Merge</td>
<td>B 14.5</td>
<td>B 14.1</td>
</tr>
<tr>
<td>Fort Weaver Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SB Off-Ramp Lane Drop to WB</td>
<td>E 46.1</td>
<td>A 6.4</td>
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<td>SB Off-Ramp Diverge to EB</td>
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<td>B 12.3</td>
</tr>
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<td>B 13.7</td>
<td>B 13.7</td>
</tr>
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</tr>
<tr>
<td>WB Kunia/H-1 Weave</td>
<td>F 62.8</td>
<td>F 45.0</td>
</tr>
</tbody>
</table>

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

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For the No-Build Alternative, at the Fort Weaver Interchange, the southbound off-ramp to Farrington Highway operates at LOS E during the A.M. peak period, as this ramp would pick up the majority of the UH West Oahu traffic. The northbound on-ramp from Farrington Highway would also operate at LOS E due to growth in the Ewa and Ewa Beach areas.

The remaining ramps at the Kunia, Makakilo, and Fort Weaver Interchanges would operate reasonably well in the No-Build scenario during both the A.M. and P.M. peak periods. Operations at these ramps are at a low LOS D or better.

When the North-South Road Interchange and North-South Road are included in these analyses, overall ramp operations at every interchange improve as vehicles now have another way to access the H-1 Freeway. At the Fort Weaver Interchange, the two off-ramps operating at LOS E in the No-Build scenario, would both operate acceptably in the Build scenario. The southbound off-ramp to Farrington Highway would operate at LOS A in the Build scenario because North-South Road would provide easier access to those headed to the UH West Oahu Campus. The northbound on-ramp from Farrington Highway would operate at an acceptable LOS C.

The LOS F conditions at the Kunia Interchange in the No-Build scenario improve in the Build scenario, but drivers would still experience a lot of congestion in these areas. The eastbound on-ramp off of Kunia Road would operate at LOS E during both the A.M. and P.M. peak periods, and operations at the weave on Kunia Road between H-1 Freeway and Farrington Highway would improve to a lower LOS F. The addition of the North-South Road did relieve some of the congestion on Fort Weaver Road, but as explained earlier in this report, Fort Weaver Road is already operating over capacity. The fact that the Ewa and Ewa Beach areas are still growing/developing only adds to the problem.

Copies of the analysis worksheets are included in Appendix D.

**Interchange Terminal Operations**

Table 3.3-8 summarizes the results of the Interchange Terminal analysis.

As shown in Table 3.3-6, the interchange terminals at Makakilo Interchange would experience problems under the No-Build scenario. The H-1 Westbound Off-Ramp/Makakilo Drive terminal operates under a LOS of F during the A.M. peak period and the H-1 Eastbound Off-Ramp/Makakilo Drive terminal operates at LOS F during the P.M. peak period. These terminals cannot handle the increased traffic demand caused by all of the development in this area.

The interchange terminals at Kunia Interchange and Fort Weaver Interchange would operate reasonably well in Year 2025 without the North-South Road Interchange. The terminals at Fort Weaver Interchange would operate at an acceptable LOS C or better, while the terminals at Kunia Interchange would experience longer delays but still operate at LOS D or better.
Table 3.3-8:  
Year 2025 Interchange Terminal Level-of-Service

<table>
<thead>
<tr>
<th>Interchange Terminals</th>
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<th></th>
<th>P.M. Peak</th>
<th></th>
</tr>
</thead>
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<td>No-Build</td>
<td>Build</td>
<td>No-Build</td>
<td>Build</td>
</tr>
<tr>
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Kapolei Parkway, North-South Road and North-South Road Interchange would help the adjacent Interchanges, Makakilo Interchange and Kunia Interchange, by allowing an alternate location for traffic to access the H-1 Freeway. Most importantly, it would alleviate the traffic volume at the Makakilo Interchange terminals, which would all operate at LOS B or better under the Build scenario.

Adjacent Intersection Operations

Table 3.3-9 summarizes the results of the intersection analysis.

As shown in Table 3.3-9, traffic operations at the intersection of Farrington Highway and Makakilo Drive/Fort Barrette Road in the No-Build Alternative would experience heavy congestion and long delays on several approaches during both the A.M. and P.M. peak periods. The intersection experiences overcapacity conditions due to the large increase in traffic demand caused by the planned development of the City of Kapolei, the Villages of Kapolei, and the UH-West Oahu Campus.

Given the high-level of improvements already implemented at this intersection, further geometric changes and adjustments to signal timing are unlikely to be effective. During the A.M. peak period, the mauka-bound through movement and the makai-bound left-turn movement on Fort Barrette Road are the primary movements that are over-capacity. During the P.M. peak period, the same two movements plus the Waianae-bound right-turn movement on Farrington Highway are constrained.

The North-South Road Interchange provides another regional access into the Ewa Plain thereby sharing and lessening the demand placed on the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection. With the North-South Road Interchange, the Farrington Highway and Makakilo Drive/Fort Barrette Road intersection would operate at an improved overall LOS C during both the A.M. and P.M. peak periods.

The Farrington Highway/North-South Road intersection is projected to operate at LOS C during the A.M. peak period and at a marginal LOS D during the P.M. peak period. These level-of-service determinations are considered acceptable for urban, peak hour operations.

The intersections along the Fort Weaver Road corridor are projected to operate at a much improved level-of-service due to the additional regional access to the H-1 Freeway.

Kapolei Parkway intersections at North-South Road and at Renton Road are projected to operate acceptably in both the No-Build and Build Alternatives. The Kapolei Parkway/North-South Road intersection is anticipated to warrant signalization for both the No-Build and Build alternatives. Likewise, the Kapolei Parkway / Renton Road intersection is also anticipated to warrant signalization in both the No-Build and Build Alternatives. Traffic signals will be installed. The designers of the future traffic signal at the Kapolei Parkway/Renton Road intersection will consider comments received from the State Historic Preservation Division (SHPD) in designing the signal hardware and in developing the signal timing plan. See Section 3.10.3 for a description of SHPD comments.
### Table 3.3-9:
Year 2025 Intersection Level-of-Service

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

September 2004
The Fort Weaver Road and Renton Road intersection is projected to be very congested in the No-Build Alternative, operating at an overall LOS F. Fort Weaver Road would experience heavy congestion and long delays in the north-south direction during both A.M. and P.M. Peaks. The intersection experiences overcapacity conditions due to the large increase in traffic destined to the H-1 Freeway caused by the shift in travel patterns from North-South Road to Fort Weaver Road. Even the future six-lane widening, adjustments to signal timing or any further geometric improvements are unlikely to accommodate the future north-south demand.

In the Build Alternative, Fort Weaver Road is projected to operate acceptably (LOS D or better). With future improvements and alternative routes provided to H-1 Freeway, traffic in the Ewa area is able to distribute to North-South Road providing alleviation to Fort Weaver Road.

3.3.1.2b Public Transit

As described in Section 3.3.1.1c, the City and County of Honolulu was assumed to operate a 794-bus fleet by the Year 2025, which includes the regional BRT system. It currently operates a 525-bus fleet. Figure 3.3-11 shows the Year 2025 projected bus routes for the study area. The primary difference from the existing transit system is the assumed implementation of a high-capacity regional transit system that would serve the H-1 Freeway corridor.

Although, the No-Build and Build Alternatives assume similar transit systems, the Build Alternative allows the transit system to provide better service. The Build Alternative includes an exclusive rapid transit corridor that would be reserved within the 28-foot median of North-South Road. This future transit corridor would begin at H-1 Freeway and proceed makai to Kapolei Parkway. At Kapolei Parkway, the transit corridor would connect to the existing east-west rapid transit corridor located within the median of Kapolei Parkway. At select locations along North-South Road, there may be the need for future widening of the median to provide for transit stops. The City and County of Honolulu is proposing a future park-and-ride facility in the vicinity of North-South Road/ Farrington Highway intersection. A park-and-ride facility in this area would serve this growing area better and would provide transit vehicles better access to H-1 Freeway than the No-Build Alternative. The No-Build Alternative would lessen the effectiveness of a proposed North-South Road park-and-ride, requiring transit vehicles to use park-and-ride facilities targeted for other communities. The same number of transit vehicles would be provided in both alternatives, but the Build Alternative would allow more efficient service. Also, as described in Section 3.3.1.2, the Build Alternative would improve traffic conditions on certain roadways, intersections and ramps. Therefore, the Build Alternative would improve transit services if overall traffic operations improve, because transit vehicles would use the same roadways as other vehicles.

3.3.1.2c Conclusion

The traffic impact analysis conducted above indicates that implementation of the proposed North-South Road and Kapolei Parkway project would result in the following benefits:
• Traffic conditions would be substantially improved along the congested Kunia Road/Fort Weaver Road corridor. Year 2025 volumes on Kunia Road between H-1 and Farrington Highway are projected to decrease by about 2,745 and 730 vph in both directions, during the A.M. and P.M. peak hours, respectively, when compared to the No-Build Alternative. In addition to improved highway operating conditions during both peak periods and in both directions of travel, each of the analyzed intersections along the Kunia Road/Fort Weaver Road corridor would benefit from the project.

Similarly, traffic conditions would be improved along the Makakilo Drive/Fort Barrette Road corridor. With the project, Year 2025 volumes along Fort Barrette Road between H-1 Freeway and Farrington Highway are projected to decline by about 1,755 and 3,384 vph during the A.M. and P.M. peak hours, respectively, when compared to the No-Build Alternative. The intersection analysis indicated that this shift would result in improved level-of-service at the Makakilo Drive/H-1 Freeway westbound ramp terminal and Fort Barrette Road/Makakilo Drive and Farrington Highway intersection.

• With the project reductions in volume to capacity (v/c) ratios and average vehicle delays are projected for key intersections along the Kunia Road/Fort Weaver Road and Makakilo Drive/Fort Barrette Road corridors (see Appendix D).

North-South Road itself is projected to carry large traffic volumes, all of which would relieve other streets in the study area. Additionally, each of the future intersections along North-South Road and Kapolei Parkway, including those at the H-1 Freeway interchange, are projected to operate at acceptable level-of-service under the Year 2025 Build Alternative.

In summary, analyses indicate that existing freeway operations and ramp merge-diverge operations are good for peak hour conditions. Access to the interchanges, however, is constrained by the arterial intersections along the primary north-south corridors of Fort Weaver Road and Fort Barrette Road. Construction of North-South Road Interchange at the H-1 Freeway, North-South Road between the H-1 Freeway and Kapolei Parkway, and the construction of Kapolei Parkway between North-South Road and Renton Road would serve as an alternate route to access the greater Ewa area. The proposed project would provide additional roadway capacity in a high-growth area and would relieve congested key parallel corridors.

3.3.1.3 MITIGATION MEASURES

3.3.1.3a Traffic

The proposed North-South Road, North-South Road Interchange and the portion of Kapolei Parkway between Renton Road and North-South Road are expected to improve traffic operations at intersections along the Fort Weaver Road and Fort Barrette Road corridors. In general, the transportation improvements provided under the Build Alternative would provide better sub-regional mobility within the Ewa Plain than No-Build Alternative. Therefore, no mitigation measures are necessary.
a 3.3.1.3b Public Transit

Future transit planning in the Ewa Plain identifies a future park-and-ride bus facility near the intersection of Farrington Highway and North-South Road as part of the Regional BRT system and Hub-and-Spoke system. Implementation of the North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road would be consistent with this future transit enhancement for the Ewa Plain and would be beneficial for implementation of long-range transit plans in the Ewa Plain area. Therefore, no mitigation will be needed for transit.

3.3.1.3c Pedestrian Facilities

Currently, there are no pedestrian facilities within the study corridor. All future pedestrian facilities constructed as part of this project will comply with the Americans with Disabilities Act (ADA) regulations and guidelines. As shown in Figure 2.1-3 and 2.1-4, 8-foot sidewalks will be provided along both sides of the North-South Road corridor and a 4-foot sidewalk and a 10-foot shared bike/jogging path along the Kapolei Parkway segment. Therefore, no mitigation will be needed for pedestrian facilities.

3.3.2 UTILITIES

3.3.2.1 EXISTING CONDITIONS

Water, sewer, and drainage master plans were prepared for the East Kapolei EIS. These plans took into account the mauka University of Hawaii West Oahu (UH-West Oahu) campus and Kualoa (Barbers Point). DHHL would revise the plans for their lands and UH-West Oahu would revise the plans for the makai campus, should they proceed with the planning and entitlement process for development of the campus in its proposed location.

The project would cross existing 30-inch and 36-inch waterlines located within the Farrington Highway ROW. Coordination with the City will be required prior to construction for review and approval.

The Honolulu Wastewater Treatment Plant, located on the corner of North Hanson and Geiger Roads, is the treatment facility serving the Ewa region.

An easement exists for the use of Hawaiian Electric Company (HECO), which operates the existing 138-kilovolt (kV) power line that cuts through the project area. This power corridor runs parallel to the proposed North-South Road alignment, and access to power poles is currently possible via a very rough and overgrown dirt road adjacent to farmland. There is also an energy corridor, which contains oil and fuel lines along Farrington Highway.
3.3.2.2 POTENTIAL IMPACTS

The No-Build Alternative assumes that the portion of Kapolei Parkway between Renton Road and Kapolei Parkway would be constructed, but at a later date than under the Build Alternative. Therefore, under the No-Build Alternative, the portion of Kapolei Parkway, as well as other planned roadway improvement projects would be developed, and utilities would be co-located with Kapolei Parkway and other roads as they are constructed.

In addition to the conditions described for the No-Build Alternative, under the Build Alternative, potable water, sewer, and non-potable water lines are planned to be co-located within the North-South Road ROW. Utilities would also be placed under the portion of Kapolei Parkway between Renton Road and North-South Road. Because the construction and installation of the transmission lines will be coordinated with the appropriate City agencies, and will conform to the water master plan for the eastern Kapolei area, no adverse impact on existing or future public utilities is anticipated. Water, sewer and drainage master plans were prepared for the East Kapolei EIS looking at the University of Hawaii West Oahu Campus (UH-West Oahu) mauka of H-1 Freeway. DHHL and UH-West Oahu would revise their plans, should they proceed with the planning and entitlement process for their developments.

The HECO easement will be maintained on the east side of North-South Road, between the roadway and the drainage channel. The roadway will match the alignment of the 138kV lines, because the area has been planned to accommodate both the road and the power lines within the same corridor. The proposed bike path (see Section 3.3.3) will be designed to not conflict with the HECO access road. Part of the ROW accommodating the transit easement, roadway, and the HECO easement has already been subdivided, from the proposed Kapolei Parkway to roughly halfway towards Farrington Highway. The remainder of the ROW is being obtained by HDOT.

No adverse impact on the HECO easement and its 138 kV poles is anticipated, with the exception of one pole at Farrington Highway which will need to be relocated. In general, HECO would benefit from the construction of the roadway, which would allow it to access its power lines more easily. HECO maintenance vehicles will also be allowed to use the roadway for regular and emergency work, if necessary, and upon coordination with HDOT.

3.3.2.3 MITIGATION MEASURES

HDOT commits to coordination with HECO on the anticipated relocation of one 138 kV power pole. Because no other adverse impacts to existing and future utilities are anticipated, no other mitigation measures are necessary.
3.3.3 CYCLING FACILITIES

3.3.3.1 EXISTING CONDITIONS

There are three basic types of bikeways: a "bike route" is a signed, shared roadway specifically designated as a preferred route for bicycling; a "bike lane" refers to a section of roadway designated for bicycling use by striping, signing, and/or pavement markings and a "bike path" is a bikeway physically separated from motorized vehicular traffic by an open space or barrier.

As shown on Figure 3.3-12, existing cycling facilities or bikeways (i.e., bike paths, lanes, or routes) in the general vicinity of the project area include a bike path along Fort Weaver Road from Farrington Highway to just north of Ewa Beach, and bike lanes on Fort Weaver Road in Ewa Beach. Fort Weaver Road has wide paved shoulders, which provide ample space for cycling outside of travel lanes. Fort Weaver Road may qualify as a bike route, if so designated, because of these paved shoulders. Bike paths are also provided in the Ewa Gentry community along Geiger Road, Kapolei Parkway, Kolowaka Drive, and Keaunui Road.

Bike Plan Hawaii, A State of Hawaii Master Plan (September 2003) (hereafter referred to as "State bike plan") prepared by HDOT provides recommendations for improving bikeway systems statewide. This plan serves as guidance to HDOT and county agencies when new roadway construction or improvements to existing roadways are considered. In addition to showing existing bikeways, Figure 3.3-12 displays some bikeways recommended for the Ewa region in the State bike plan, including the following:

- Future North-South Road: bike lanes
- Existing and future sections of Kapolei Parkway (Ocean Pointe to Villages of Kapolei): bike lanes
- Fort Weaver Road: bike route
- Renton Road: bike route
- Farrington Highway: bike route and bike path (North-South Road to Farrington Highway)
- OR&L ROW: bike path

3.3.3.2 POTENTIAL IMPACTS

As described in Section 2.1, the No-Build Alternative assumes that Kapolei Parkway would be constructed, but at a later date than under the Build Alternative. Under the No-Build Alternative, the portion of Kapolei Parkway from Renton Road to North-South Road would be developed, and would include a parallel bike/pedestrian path. It also may provide wide enough curb lanes that can be designated as a bike route if only two lanes are provided in both directions (Kapolei Parkway in Ewa Gentry is configured in such a manner). However, current plans call for three lanes in each direction. By providing a bike/pedestrian path, construction of Kapolei Parkway would go above and beyond what
is recommended in the State bike plan. However, bike lanes, which tend to be preferred by experienced cyclists and are recommended in the State bike plan for Kapolei Parkway, would not be provided. Bike paths tend to be more popular with recreational or novice cyclists.

Under the Build Alternative, North-South Road would be developed in addition to the portion of Kapolei Parkway between Renton Road and North-South Road. A bike path will be included within the North-South Road ROW, as shown in Figure 2.1-3. HDOT will allow the Hawaiian Electric Company (HECO) to use this bike path to maintain their 138 kV power lines which are located within the North-South Road ROW.

3.3.3.3 MITIGATION MEASURES

Because no adverse impacts to existing and future bikeways are anticipated, no mitigation measures are necessary.

3.4 SOCIAL, CULTURAL, AND ECONOMIC ACTIVITIES

3.4.1 EXISTING CONDITIONS

3.4.1.1 POPULATION

From 1990 to 2000, the population in the selected Ewa neighborhoods has increased substantially when compared to Oahu, with the exception of the Villages of Kapolei (see Table 3.4-1). The population of the Ewa region, defined by the City’s designated Ewa DP area, was 68,718 in 2000, or 8 percent of the total Oahu population. However, because of the large residential development in the Ewa region since that year, the current population in the Ewa region exceeds the year 2000 count. Ewa by Gentry and Ewa Villages show the highest percent change in the Ewa DP area. Section 3.1 shows how considerable growth in the Ewa DP region has resulted from planned land use development trends.

Table 3.4-2 exhibits demographic characteristics for Oahu, the Ewa DP area, selected neighborhoods in Ewa, and selected census tracts in the project vicinity. Figure 3.4-1 illustrates the census tract and incorporated place boundaries in the project area.

Rapid population growth in the Ewa DP area has balanced the ethnic characteristics of Ewa residents to be closer to that of the general population of Oahu and the State. In Hawaii, no one ethnic group exceeded 24 percent of the overall State population in 2000. In addition, those who classify themselves as “two or more races” made up 21 percent of the State population in 2000.

In comparison with demographic characteristics of the total Oahu population, Filipinos tended to be overrepresented and Japanese underrepresented in the Ewa DP area. The slightly larger percentage of Filipinos in the Ewa DP area as compared to the overall
Oahu population is attributable to the larger percentage of Filipinos living in Ewa Beach and Ewa Villages, two of the older communities in Ewa. While data on detailed race is not available through the U.S. Census at the block level, public outreach efforts conducted in Varona Village (see Section 3.4.2) revealed that this neighborhood appears to consist predominantly of Filipino immigrant families with elderly family members with ties to the plantation days of the Ewa region. Varona Village, a portion of Ewa Villages adjacent to the proposed North-South Road and Kapolei Parkway intersection, was one of the plantation worker villages and is the only village which has not yet been upgraded and remodeled by the City and County of Honolulu.

Table 3.4-1:
Year 1990 and 2000 Population of Selected Ewa Neighborhoods

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oahu</td>
<td>836,231</td>
<td>876,156</td>
<td>4.7%</td>
</tr>
<tr>
<td>Ewa DP Area</td>
<td>42,960</td>
<td>68,718</td>
<td>60.0%</td>
</tr>
<tr>
<td>Ewa Beach</td>
<td>14,315</td>
<td>14,650</td>
<td>2.3%</td>
</tr>
<tr>
<td>Ewa by Gentry</td>
<td>1,992</td>
<td>4,399</td>
<td>147.9%</td>
</tr>
<tr>
<td>Ewa Villages</td>
<td>3,780</td>
<td>4,741</td>
<td>25.4%</td>
</tr>
<tr>
<td>Villages of Kapolei</td>
<td>8,832</td>
<td>8,834</td>
<td>0%</td>
</tr>
</tbody>
</table>


The newer, privately-developed communities of Ewa by Gentry and the Villages of Kapolei have demographic characteristics similar to the island as a whole, although Filipinos are still overrepresented, and Japanese and whites are underrepresented. Development of the Ocean Pointe neighborhood started after the 2000 census data was compiled.

As shown in Table 3.4-2, the median age of residents in the selected neighborhoods of the Ewa DP area is slightly lower than the median age for Oahu. As newer residents move into the Ewa region, the median age would be pushed downward as compared to Oahu overall, because more younger families tend to buy affordable housing in the region. On the other hand, the median age of Varona Village residents is notably higher than that of the Ewa DP area, due to the relatively high percentage of senior citizens and relatively lower percentage of children.
**Table 3.4-2:**
Year 2000 Demographic Characteristics of Selected Ewa Neighborhoods

<table>
<thead>
<tr>
<th>Selected Neighborhoods</th>
<th>Selected Census Tracts</th>
<th>Varona Village¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oahu</td>
<td>Ewa DP Area</td>
</tr>
<tr>
<td>Population</td>
<td>876,156</td>
<td>68,716</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>21%</td>
<td>18%</td>
</tr>
<tr>
<td>African American</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Japanese</td>
<td>18%</td>
<td>6%</td>
</tr>
<tr>
<td>Filipino</td>
<td>14%</td>
<td>27%</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>20%</td>
<td>24%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Than 5 Years</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>5 to 17 Years</td>
<td>17%</td>
<td>23%</td>
</tr>
<tr>
<td>18 to 64 Years</td>
<td>63%</td>
<td>62%</td>
</tr>
<tr>
<td>65 or More Years</td>
<td>13%</td>
<td>7%</td>
</tr>
<tr>
<td>Median Age (Years)</td>
<td>35.7</td>
<td>31.2</td>
</tr>
</tbody>
</table>

Notes: ¹Varona Villages consists of: Census Tract 86.05 Blocks 2025, 2026, 2027, 2029, 2030, 2031, 2032, 2033, 3024, 3025, 3027, 3030, 3032, 3033.
3.4.1.2 EMPLOYMENT AND INCOME

Table 3.4-3 shows median household incomes for Oahu, the Ewa DP area, selected neighborhoods, and census tracts in 2000. Incomes as a whole were higher than the median household income for Oahu, with the exception of Ewa Villages. Similarly, a smaller or equal percentage of residents live below the poverty line. Income differences between the upper and lower income brackets in the Ewa DP area are greater than for Oahu overall. For example, in 2000 there was a lower percentage of residents in the Ewa DP area with incomes below $15,000 and a higher percentage above $75,000 compared with Oahu overall.

Also as shown in Table 3.4-3, a lower percentage of households in Ewa live on social security or retirement income in comparison to Oahu overall. However, certain neighborhoods, such as Ewa Beach, and Ewa Villages have slightly higher percentages of households receiving social security or retirement income in comparison to the island-wide average. As expected, the newer neighborhoods, such as Ewa by Gentry and the Villages of Kapolei (census tracts 86.06 and 86.07), have substantially lower percentages of households living off of social security or retirement income than Oahu overall.

As shown in Table 3.4-4, unemployment in the selected neighborhoods and in the census tracts in the study area were similar to Oahu overall. The percentage of workers in Ewa Villages using public transportation to commute to work was higher when compared to Oahu overall.

3.4.1.3 HOUSING

In 2000, there were 64 percent owner-occupied housing units, compared to 27 percent renter-occupied housing units in the Ewa DP area. Oahu's island-wide percentages were more evenly split, with 49 percent owner-occupied and 41 percent renter-occupied. The larger proportion of owner-occupied to renter-occupied housing units in the Ewa DP area as compared to the overall Oahu situation is attributable to the large number of new single-family residential developments in the Ewa region. As shown in Table 3.4-5, in the selected neighborhoods of Ewa by Gentry and Ewa Villages, there were large proportions of owner-occupants. Census tracts in the project vicinity had a higher proportion of owner-occupants than most of the selected neighborhoods.

Also, Table 3.4-5 indicates that most of these selected neighborhoods in the Ewa DP area had a higher percentage of their housing stock as single-family compared to Oahu overall. The one exception was Ewa by Gentry, the majority of which are low-density, townhouse style multiple-family housing units.

Also indicated in Table 3.4-5, the Ewa DP area had a higher percentage of new housing as compared to Oahu overall. For all but Ewa Beach and Ewa Villages, the majority of homes in each of the selected neighborhoods were built within the last decade.
Table 3.4-3:
Year 2000 Income Characteristics of Selected Ewa Neighborhoods

<table>
<thead>
<tr>
<th>Selected Neighborhoods</th>
<th>Oahu</th>
<th>Ewa DP Area</th>
<th>Ewa Beach</th>
<th>Ewa by Gentry</th>
<th>Ewa Villages</th>
<th>Selected Census Tracts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>86.05</td>
</tr>
<tr>
<td>Number of Households</td>
<td>266,731</td>
<td>19,092</td>
<td>3,312</td>
<td>1,678</td>
<td>1,121</td>
<td>2,237</td>
</tr>
<tr>
<td>Female householders¹ in families</td>
<td>17%</td>
<td>2%</td>
<td>18%</td>
<td>9%</td>
<td>12%</td>
<td>5%</td>
</tr>
<tr>
<td>Income by Household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>86.05</td>
</tr>
<tr>
<td>Median Income²</td>
<td>$51,914</td>
<td>$60,611</td>
<td>$57,073</td>
<td>$61,462</td>
<td>$51,451</td>
<td>$53,363</td>
</tr>
<tr>
<td>Lower Than $15,000</td>
<td>11%</td>
<td>5%</td>
<td>8%</td>
<td>3%</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Higher Than $75,000</td>
<td>32%</td>
<td>34%</td>
<td>33%</td>
<td>33%</td>
<td>24%</td>
<td>28%</td>
</tr>
<tr>
<td>Selected Income Sources by Household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>86.05</td>
</tr>
<tr>
<td>Social Security Income</td>
<td>27%</td>
<td>17%</td>
<td>30%</td>
<td>9%</td>
<td>34%</td>
<td>26%</td>
</tr>
<tr>
<td>Retirement Income</td>
<td>22%</td>
<td>17%</td>
<td>26%</td>
<td>7%</td>
<td>30%</td>
<td>23%</td>
</tr>
<tr>
<td>Public Assistance Income</td>
<td>7%</td>
<td>7%</td>
<td>13%</td>
<td>2%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Persons Below Poverty Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>86.05</td>
</tr>
<tr>
<td>Below 125% Poverty Level</td>
<td>10%</td>
<td>5%</td>
<td>10%</td>
<td>3%</td>
<td>9%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Notes: Varona Villages consists of: Census Tract 86.05 Blocks 2025, 2026, 2027, 2029, 2030, 2031, 2032, 2033, 2024, 2025, 3027, 3030, 3032, 3033. No census data was found for these blocks.
² In 1999 dollars.
<table>
<thead>
<tr>
<th></th>
<th>Oahu</th>
<th>Ewa by</th>
<th>Ewa Gentry</th>
<th>Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>86.05</td>
<td>86.06</td>
<td>86.07</td>
<td></td>
</tr>
<tr>
<td>Population 16 years and over</td>
<td>691,015</td>
<td>10,965</td>
<td>3,759</td>
<td>6,353</td>
</tr>
<tr>
<td>Employment Status</td>
<td>59%</td>
<td>49%</td>
<td>63%</td>
<td>66%</td>
</tr>
<tr>
<td>Civilian</td>
<td>55%</td>
<td>50%</td>
<td>62%</td>
<td>64%</td>
</tr>
<tr>
<td>Employed</td>
<td>55%</td>
<td>62%</td>
<td>57%</td>
<td>60%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Workers 10 years and over</td>
<td>412,250</td>
<td>32,316</td>
<td>6,166</td>
<td>1,780</td>
</tr>
<tr>
<td>Car or Van (own or drive alone)</td>
<td>61%</td>
<td>64%</td>
<td>63%</td>
<td>65%</td>
</tr>
<tr>
<td>Public Transportation</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>Walker</td>
<td>6%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Other means of transportation</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Notes:**
- Data is from the U.S. Census Bureau’s 2000 Census long form.
- Percentages are based on the number of people who responded.

Source: U.S. Census Bureau, 2000 Census Summary File 1 (SF 1) and 3 (SF 3), April 2000.
### Table 3.4-5:
Year 2000 Housing Characteristics of Selected Ewa Neighborhoods

<table>
<thead>
<tr>
<th></th>
<th>Selected Neighborhoods</th>
<th>Selected Census Tracts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oahu</td>
<td>Ewa DP Area</td>
</tr>
<tr>
<td><strong>Number of Housing Units</strong></td>
<td>315,988</td>
<td>20,854</td>
</tr>
<tr>
<td><strong>Tenure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owner-Occupied</td>
<td>49%</td>
<td>64%</td>
</tr>
<tr>
<td>Renter-Occupied</td>
<td>41%</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Year Structure Built</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Year</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>2 to 10 Years</td>
<td>13%</td>
<td>45%</td>
</tr>
<tr>
<td>11 to 20 Years</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>21 Years or More</td>
<td>72%</td>
<td>39%</td>
</tr>
<tr>
<td><strong>Units in Structure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Unit</td>
<td>55%</td>
<td>73%</td>
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<tr>
<td>2 to 4 Units</td>
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<td>5 or More Units</td>
<td>38%</td>
<td>21%</td>
</tr>
<tr>
<td>Trailer, Other</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Notes:** Varona Villages consists of: Census Tract 86.05 Blocks 2025, 2026, 2027, 2020, 2030, 2031, 2032, 2033, 3024, 3025, 3027, 3030, 3032, 3033. No census data was found for these blocks.

**Source:**
- City and County of Honolulu, Department of Planning and Permitting, Community Profiles by Development Plan Area: 2000, May 2003.
3.4.1.4 EMPLOYMENT AND GENERAL ECONOMIC CONDITIONS

From the late 1800s to the 1980s, sugar cultivation and processing were the dominant economic activities in the Ewa region. Ewa Plantation Company, incorporated in 1890 by Castle and Cooke, was one of the major employers in the region for most of the 20th century. In 1970, Castle and Cooke sold the Ewa Plantation Company to AMFAC, and the company merged with Oahu Sugar Company. However, from the 1970s to the 1990s, the sugar industry on Oahu and throughout the State declined substantially, and sugar cultivation in Ewa ceased following the 1995 harvest. See Section 3.2 for a discussion of current farmland uses.

The economic base in Ewa shifted in the 1980s and 1990s to urban development of mostly residential and commercial uses, which encroached upon sugarcane land.

Major employment areas in Ewa include the following:

- The City of Kapolei, located approximately 2.2 miles west of the proposed corridor, is the center of civic, office, and commercial uses in Ewa, featuring private and government offices, and commercial establishments;
- The 1,367-acre James Campbell Industrial Park (JCIP), located approximately five miles southwest of the proposed corridor, is Hawaii’s largest heavy industrial park and employs more than 4,500 people;
- Kalaeloa Barbers Point Harbor, located approximately 5.5 miles west of the proposed corridor, is Oahu’s secondary commercial harbor, and would be supported by the 48-acre Koaia Industrial Park adjacent to the Harbor;
- The 890-acre Kapolei Business-Industrial Park, located northeast of JCIP, is currently being developed by EJC; and
- Ko Olina Resort, a planned resort community located northwest of JCIP, features four sandy beach lagoons, an 18-hole golf course, a 267-slip marina, and one hotel.

Beyond the Ewa DP’s urban growth boundary, Grace Pacific Corporation employs 20 to 30 people at their Makakilo Basalt Quarry located above H-1 Freeway and accessed via Palehua Road off of Farrington Highway.

The former naval air station at Barbers Point used to be the leading employment center in Ewa with over 5,700 jobs. Since the base closure and transfer of lands to the State of Hawaii (see Section 3.1.1.1), most of these jobs no longer exist. New jobs may materialize over time as the base transitions to civilian uses, but no specific plans have been adopted.

Despite rapid urbanization in Ewa, agricultural businesses still exist (see Sections 3.1. and 3.2) and generate employment. However, many of the businesses lease from EJC and the State’s DLNR on short-term leases (see Figure 3.2-3), and long-term agricultural activity is not planned under the Ewa DP.
In the future, the Ewa region is expected to generate a high rate of employment growth on Oahu according to the City and County of Honolulu Department of Planning and Permitting (DPP) (Ewa Development Plan, 2000). DPP estimates that the number of jobs in the Ewa DP area would increase from a 1997 total of approximately 17,000 to 64,000 in the Year 2020, a 276 percent increase (Ewa Development Plan, 2000). Most of this job growth would occur at the City of Kapolei, JCIP, Kapolei Business-Industrial Park, Kaaawa Barbers Point Harbor and its surrounding industrial land uses, and the Ko Olina Resort. In comparison, Oahu is expected to see employment increase by 40 percent during the same period, or an average annual rate of about two percent.

3.4.1.5 COMMUNITY SERVICES AND FACILITIES

Figure 3.4-2 shows the following community services and public facilities in the vicinity of the project, which are listed below. Parks and recreational facilities are described in Section 3.11 (see Figure 3.11-1); bikeways are discussed in Section 3.3 (see Figure 3.3-10).

- Kapolei Police Station;
- Several public schools, including Kapolei High School, Kapolei Middle School, and Ewa Elementary School, Kapolei Elementary School, and Mauka Lani Elementary Schools;
- Several churches and private schools;
- Shopping centers in Kapolei and Makakilo;
- Kapolei Public Library;
- Saint Francis Medical Center-West and the Kapolei Medical Center; and
- U.S. Post Offices in Kapolei and Ewa Villages.

In addition to those services above, the community services and public facilities in the Ewa region, outside the project vicinity (not shown in Figure 3.4-2) include:

- Four fire stations in Makakilo, Waipahu, Ewa Beach, and Kapolei;
- Campbell High School, Ilima Middle school, and Ewa Beach, Pohakea, Kaimiloa, Holomua, Kapolei, Barbers Point, and Makakilo Elementary Schools;
- Ewa Beach Public Library

Traffic observations were conducted at Kapolei High School and Kapolei Middle School (see Section 3.3). Students walking to school must cross Kapolei Parkway. Many of the students cross Kapolei Parkway at Malu Ohai Street or Kamehame Avenue. However, some students jay-walk at various other locations on Kapolei Parkway. There are no community or public facilities immediately adjacent to the project alignment.

3.4.1.6 CULTURAL ACTIVITIES

The project area – located in the broad, dry inland plain – is well outside the permanent habitation areas of pre-contact Hawaiians within the Honolulu ahupuaa. The only preserved Hawaiian place name associated with any feature in the immediate vicinity of
the project area is Kaloi Gulch (see Section 3.8). However, there is evidence that the portion of Honouliuli to be used for the project was known in traditional Hawaiian times as "Waihuna" or "Punahuna", a hidden spring associated with Kaloi Gulch. Also, a traditional Hawaiian trail through Honouliuli between Puuola and Puu Kapolei and Waimanalo may have followed the route of the present-day Farrington Highway (Ewa) (Ii 1983:97). However, no traces of this trail remain or have been documented. A cultural impact evaluation prepared by Cultural Surveys Hawaii (2004) is included as Appendix M.

Given the environmental constraints within the portion of the shpuaa being used for the project, it is likely that the major traditional cultural practice associated with the region including the present project area would have been the gathering of native plant resources. However, the accessibility of Honouliuli lands to the Hawaiians for gathering or other cultural purposes was radically curtailed during the second half of the nineteenth century due initially to cattle grazing, and later commercial sugarcane cultivation (see Section 3.1). Evidence of any historic properties related to traditional Hawaiian culture have not been identified on the land surface during field investigations, due mainly to decades of sugar cultivation activities (see Section 3.10.2).

The Cultural Impact Evaluation (Appendix M) indicates that the project area does not appear to be used for contemporary or continuing cultural practices; however, upon further consultation, it was discovered that the Ewa Hongwanji Mission has been informally using the makai portion of Kapolei Parkway between Renton Road and the OR&R ROW as a parking area during their Bon dances, a Japanese and Okinawan cultural practice that occurs one night a year in the summer time.

3.4.2 POTENTIAL IMPACTS

Under the No-Build Alternative, construction of the portion of Kapolei Parkway between Renton Road and North-South Road would not bisect any existing community or neighborhood because the alignment was master planned as part of the City's Ewa Villages redevelopment project (see Section 3.1). Similarly, the construction of North-South Road under the Build Alternative would not occur within any existing community.

Social and economic activities associated with the Ewa communities would benefit from improved transportation infrastructure provided by either of the alternatives. For example, completion of Kapolei Parkway would strengthen economic and social ties between the Ewa Beach/Ocean Pointe/Ewa by Gentry area and the City and Villages of Kapolei, by improving access to schools, libraries, and commercial establishments. Improving transportation infrastructure would also enhance emergency response services (police, fire, ambulance, and natural hazard evacuation) throughout the region.

The Build Alternative would provide more social, economic, and public services support to Ewa communities than the No-Build Alternative because it would provide a roadway link to the H-1 Freeway, as well as between existing and future communities. As part of the Build Alternative, pedestrian and bicycle paths would be provided. As a result of the Build Alternative, access to existing and future communities would be enhanced through improved connectivity of pedestrian, bicycle, and vehicle linkages. Existing
accessways would not be impeded by the proposed project. Ewa Villages would have improved access to other nearby communities with the expansion and improvement of Kapolei Parkway between Renton Road and North-South Road. Additional discussion of Varona Village in particular is provided in Section 3.4.3 below.

Under the Build Alternative, a small portion of existing agricultural uses would be displaced by ROW requirements for North-South Road, which would not occur under the No-Build Alternative. (See Sections 3.1.1.3) HDOT will maintain access to and from agricultural operations in the area and Grace Pacific Corporation's quarry in the project vicinity currently accessed via Palehua Road and/or traversing the proposed North-South Road ROW, as described in Section 3.2. Therefore, no adverse effect is anticipated to these operations with mitigation.

No adverse impact is expected on City property tax revenues, even though lands used for roadway ROW would be removed from the tax base. The City does not collect property taxes on lands used for public transportation, such as roads. However, the ROW for part of North-South Road and the portion Kapolei Parkway between Renton Road and North-South Road are already owned by the City or State, conversion of these areas from open space to roadway uses would not affect property tax revenues. While other portions of the proposed North-South Road ROW are currently in private ownership and would be acquired and removed from the property tax base, both the No-Build and Build Alternatives are likely to result in increased overall property values surrounding the new roadways, because they are planned to be developed and would have access to improved transportation services (see Section 3.1).

Both alternatives would increase short-term employment resulting from construction activities. Neither of the alternatives would increase long-term employment opportunities other than the additional need for normal roadway maintenance, which would not be substantial given the scale of maintenance already conducted by the State and City.

With the proposed project, and the completion of other segments of Kapolei Parkway, such as those between North-South Road and the Villages of Kapolei and between Ewa by Gentry and Ocean Pointe, Kapolei Parkway would become a through route from Ocean Pointe to the Villages of Kapolei. Under the No-Build Alternative, these segments will also be constructed, but the City's segment would be delayed due to fiscal constraints. However, it anticipated under the No-Build Alternative that the City segment would be completed by the design year, 2025. The completion of Kapolei Parkway would enhance regional connectivity (see Section 3.3.1.2), and therefore, improve social interactions in Ewa. For example, Kapolei Parkway would eliminate the circuitous route via Fort Weaver Road some Ewa Elementary School parents have to use.

As a through route, Kapolei Parkway would carry higher traffic volumes than at present, which would be even higher under the Build Alternative because North-South Road would provide access to the H-1 Freeway (see Section 3.3.1.2). Higher traffic volumes could affect current pedestrian movements or social activities along existing segments of Kapolei Parkway. For example, middle and high school students currently cross Kapolei Parkway in the Villages of Kapolei, some of which cross in a haphazard manner because the road currently carries relatively low volumes given its size (divided six lanes). Also,
In Ewa by Gentry, Kapolei Parkway lack of pedestrian facilities, such as crosswalks or traffic signals. Similar to the situation in the Villages of Kapolei, this is currently not a major problem because of the limited use of Kapolei Parkway as a through route. With regards to potential safety concerns at Kapolei Middle School and Kapolei High School, HCDCH commissioned a traffic study to identify actions to enhance pedestrian crossing safety on Kapolei Parkway, which was presented to the Villages of Kapolei Association and the City and County of Honolulu. Recommended actions include signalization of existing pedestrian crossings, proposed new signalized pedestrian crossings, and relocation of bus stops. With these improvements, which would be implemented regardless of the alternative selected, Kapolei Parkway would be able to accommodate the additional traffic volumes while maintaining pedestrian safety. In Ewa Villages and Ewa by Gentry, many of the intersections along Kapolei Parkway would likely warrant traffic signals when traffic volumes increase due to system connectivity, such as intersections at Renton Road, Kolowaka Street, and Geiger Road. Gentry Homes is scheduled to install signals at the Geiger Road intersection in the near future subject to approval by the City.

The proposed project would not have any long or short term impacts on contemporary or continuing cultural practices. Although the Ewa Hongwanji Mission uses Kapolei Parkway for temporary event parking, the City owns the Kapolei Parkway ROW and that portion of Kapolei Parkway is not part of this proposed action. There are no other existing community or public services or facilities within the project alignment.

3.4.3 ENVIRONMENTAL JUSTICE

3.4.3.1 FEDERAL AND STATE GUIDANCE

- Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by the President on February 11, 1994, directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

If minority and low-income populations are found in the project vicinity, additional public outreach to these groups is to be conducted. Pursuant to the EO, low-income means a household income at or below the U.S. Department of Health and Human Services poverty guidelines, which, for 2004 in Hawaii, was an income at or below $21,680 per year for a family of four for 100 percent of poverty, and at or below $27,100 per year for a family of four for 125 percent of poverty. The federal definition of minority includes the following groups:

- Black: a person having origins in any of the black racial groups of Africa.
- Hispanic: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
• Asian: a person having origins in any of the original peoples of the Far East, Southeast Asia or the Indian subcontinent.
• American Indian or Alaskan Native: a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.
• Native Hawaiian or Other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

HDOT also designed the Title VI Plan (2003) to comply with all of its responsibilities under Title VI of the Civil Rights Act of 1964, Executive Order 12898, US DOT Order 5610.2, and related regulations and directives. Title VI of the Civil Rights Act of 1964 prohibits discrimination based on national origin. Therefore, the Highways Division uses detailed race categories to attempt to treat people of different national origins equitably in its highway planning, programs, and activities. To insure that the benefits of the proposed project are distributed without discriminating against any of the detailed ethnicities in Hawaii, the collection, maintenance, and analysis of data (Tables 3.4-2 through 3.4-5) follows the HDOT Title VI Plan (2003). According to the Title VI Plan, 2000 U.S. Census Data will be used as the initial basis for demographic data. The racial category of Asian Americans was broken down into detailed ethnicities as shown in Table 3.4-2.

3.4.3.2 IDENTIFICATION OF MINORITY AND/OR LOW-INCOME POPULATIONS

Varona Village is the residential community nearest to North-South Road and Kapolei Parkway. It is immediately adjacent to the City’s portion of Kapolei Parkway and within 2,000 feet of the intersection with North-South Road. Based on the publication Environmental Justice in the OMPO Planning Process (2004), Varona Village was not designated as a low income or minority population by the Oahu Metropolitan Planning Organization (OMPO). According to those OMPO guidelines, Ewa Villages including Varona Village was not identified as an EJ population area based on median income and per capita income comparisons in Oahu.

Despite the OMPO assessment, the information provided in Section 3.4.1 indicates that Ewa Villages has the highest proportion of Filipinos compared to other neighborhoods in the project area. Also, parts of Ewa Villages have higher rates of persons below poverty level than the Ewa DP area, while not exceeding the overall Oahu poverty percentage; however, census data for Varona Village alone could not be separated from Ewa Villages. Windshield surveys conducted in 2004 identified Varona Village as a potential low income and/or minority population. The other villages in Ewa Villages have been redeveloped by the City after being purchased from Oahu Sugar Company, and are now privately-owned, whereas Varona Village remains in its original condition, occupied by tenants associated with the sugar plantation days. As further observed during outreach efforts conducted in late July and early August, 2004, Varona Village residents appear to be predominantly Filipino immigrants. In addition, many residents are elderly, confirming conclusions made from Census data (see Table 3.4-2). For these reasons, HDOT has
identified Varona Village as both a minority and low-income population, as defined under EO 12298.

3.4.3.3 PUBLIC OUTREACH

Because of the potential of project impacts to Varona Village, a targeted community outreach program was conducted in this neighborhood. For the purposes of this outreach, a cluster of seven houses collectively called Hui Pupu A‘o Ewa located makai of the OR&L ROW was included despite these houses not being officially part of Varona Village. Hui Pupu A‘o Ewa residents are retired employees of the former Oahu Railway & Land Company, and their families, and are of Hawaiian descent. Between late July and early August, 2004, door-to-door interviews were conducted at 32 of 45 and four of seven occupied residences in Varona Village and Hui Pupu A‘o Ewa, respectively. Project flyers were left at those residences in which interviews could not be conducted.

In general, residents interviewed did not view the project negatively, but nevertheless raised the following environmental concerns or questions:

- Concern about construction impacts, such as dust and traffic detours or delay;
- Asked whether traffic noise from Kapolei Parkway would affect the neighborhood;
- Asked how traffic on Renton Road would be affected, including access to Ewa Elementary School; and
- Asked whether the road connecting Renton Road with F.D. Roosevelt Avenue could be closed to eliminate through traffic in the neighborhood.

In addition to the above comments, some Varona Village residents who attended the project’s public hearing expressed concern that Kapolei Parkway would isolate Varona Village from the rest of the Ewa Villages community.

3.4.3.4 POTENTIAL VARONA VILLAGE IMPACTS

As stated above, the EO on Environmental Justice requires that FHWA for this project avoid disproportionately high and adverse effects on Varona Village residents because they were identified as a minority and low-income population. Although the proposed project has the potential to cause impacts to traffic movements, traffic noise, and neighborhood isolation, these impacts were found not to be disproportionately high and adverse. The rationale for this assessment is provided below.

Varona Village residents use Renton Road when traveling in the eastbound direction. Under the No-Build or Build Alternative, a new intersection at Renton Road between Varona and Tenney Villages will be created when Kapolei Parkway is constructed through Ewa Villages. Despite the alternative selected, the new intersection will be designed with crosswalks and signals as necessary to maintain good traffic operations, and ensure pedestrian, and bicyclist safety. Varona Village residents would have to cross a new intersection when traveling on Renton Road where none exists today. However, they would gain traffic benefits, such as better access to Kapolei, the H-1
Freeway and Ewa Beach. Moreover, the current vehicular through traffic using Renton Road in Varona Village to access F.D. Roosevelt Avenue would be reduced because the completion of Kapolei Parkway would allow these users to travel to and from the Kapolei area more easily via the parkway. Residents' concerns about the connection between the west end of Renton Road and Roosevelt Avenue have been noted by the City, and the disposition of that connection will be determined at a later date.

Potential noise impacts in Varona Villages were evaluated, and the results of the analysis indicate that traffic noise impacts are not anticipated. See Section 3.6 for further information.

The alignment of Kapolei Parkway will be within an existing vacant open space area between Varona and Tenney Villages, which also contains a section of Kaloi Gulch. This alignment was identified in earlier planning documents, including the Master Plan for Ewa Villages. Therefore, construction of Kapolei Parkway is not anticipated to introduce any more of a gap than already exists.

3.4.4 MITIGATION MEASURES

HDOT will continue to coordinate with agricultural land users and Grace Pacific Corporation to minimize potential impacts to their operations.

As stated above, HDOT and the City continue to inform members of the public about construction activities and potential impacts, including Varona Village, the Department of Education, the school principals, and other community members. Dust screens and other construction-related impacts and mitigation are described in detail in Section 3.14.

During future project public involvement activities, public materials, such as flyers and handouts, will be made accessible to people with Limited English Proficiency upon request. Large font versions of the public involvement material will also be made available upon request.

3.5 AIR QUALITY

Because the proposed project alternatives would alter traffic conditions in the study area (see Section 3.3.1), the future ambient air quality conditions, which is a general term used to describe pollutant levels in the atmosphere, were analyzed. Changes in traffic volumes or patterns could result in air quality impacts, such as increases in the level of certain pollutants that in high quantities could affect public health.

This section summarizes the results of quantitative air quality impact analyses of proposed project alternatives. The air quality analyses estimated the potential impacts associated with increased traffic volumes or changes in traffic patterns at congested intersections. In addition, changes in vehicular emissions generated in the study area as a result of the proposed alternatives were estimated, and determinations were made as to whether these changes conform to air quality regulatory requirements.
3.5.1 APPLICABLE POLLUTANTS

3.5.1.1 CRITERIA POLLUTANTS

The following air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide: carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), photochemical oxidants, lead (Pb), sulfur dioxide (SO2), and particulate matter. In urban areas, ambient concentrations of CO, HC, and photochemical oxidants are predominantly influenced by motor vehicle activity; NOx are emitted from both mobile and stationary sources; emissions of sulfur oxides (SO2) are associated mainly with stationary sources; and emissions of particulate matter are associated with stationary sources, and to a lesser extent, diesel-fueled mobile sources (heavy trucks and buses). Lead emissions, which historically were principally influenced by motor vehicle activity, have been substantially reduced due to the elimination of lead from gasoline.

CO is a colorless and odorless gas that is generated in the urban environment primarily by the incomplete combustion of fossil fuels in motor vehicles. Prolonged exposure to high levels of CO can cause headaches, drowsiness, loss of equilibrium, or heart disease. CO concentrations can vary greatly over relatively short distances. Relatively high concentrations of CO are typically found near congested intersections, along heavily used roadways carrying slow-moving traffic, and in areas where atmospheric dispersion is inhibited by urban "street canyon" conditions. Consequently, CO concentrations must be predicted on a localized, or microscale, basis.

Hydrocarbons include a wide variety of volatile organic compounds, emitted principally from the storage, handling, and use of fossil fuels. NOx constitute a class of compounds that include nitrogen dioxide (NO2) and nitric oxide, both of which are emitted by motor vehicles and stationary sources. Both hydrocarbons and NOx are of concern primarily because most of those compounds react in sunlight to form photochemical oxidants, including ozone. This reaction occurs comparatively slowly and ordinarily takes place far downwind from the site of actual pollutant emission. The effects of these pollutants are normally examined on an area wide, or mesoscale, basis.

Lead emissions are principally associated with industrial sources and motor vehicles using gasoline containing lead additives. As the availability of leaded gasoline has decreased, motor vehicle-related lead emissions have decreased resulting in a substantial decline of concentrations of lead. Lead concentrations are expected to continually decrease; therefore an analysis of lead from mobile sources is not warranted.

High concentrations of Sulfur Dioxide (SO2) affect breathing and may aggravate existing respiratory and cardiovascular disease. SO2 emissions are generated from the combustion of sulfur-containing fuels—oil and coal—largely from stationary sources such as coal and oil-fired power plants, steel mills, refineries, pulp and paper mills, and nonferrous smelters. Although diesel-fueled heavy-duty vehicles also emit SO2, transportation sources are not considered by EPA (and other regulatory agencies) to be
significant sources of this pollutant that should be quantitatively evaluated in a mobile source impact analysis.

Particulate matter is a broad class of air pollutants that exist as liquid droplets or solids, with a wide range of sizes and chemical composition. Particulate matter is emitted by a variety of sources, both natural and man-made. Natural sources include the condensed and reacted forms of natural organic vapors, salt particles resulting from the evaporation of sea spray, wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and debris from live and decaying plant and animal life. Particles eroded from beaches, desert, soil and rock, particles from volcanic and geothermal eruptions and forest fires. Man-made sources of particulate matter include the combustion of fossil fuels such as vehicular exhaust, power generation and home heating, chemical and manufacturing processes, all types of construction, agricultural activities and wood-burning fireplaces.

Of particular health concern are those particles that are smaller than or equal to 10 microns (PM$_{10}$) in size and 2.5 microns (PM$_{2.5}$) in size. The principal health effects of airborne particulate matter are on the respiratory system. Regional emissions of PM$_{10}$ are considered for this analysis. However, since diesel fueled vehicles are the principal localized mobile source of PM$_{10}$ emissions and the project alternatives would not measurably affect diesel emissions, localized PM$_{10}$ impacts were not considered.

Because the PM$_{2.5}$ standards are relatively new (i.e., effective September 16, 1997), the EPA is allowing time to build a nationwide monitoring network—to collect and analyze the data needed to designate areas as to whether or not they meet these standards, as well as to develop implementation plans for areas that would be designated as not being in attainment for these standards. In addition, until a comprehensive PM$_{2.5}$ modeling system is promulgated by the EPA, compliance with national standards cannot be determined.

3.5.1.2 NON-CRITERIA POLLUTANTS

Toxic air pollutants, also called air toxics, are those pollutants that cause or may cause cancer or other serious health effects. The primary sources of air toxic contaminants are commercial and industrial facilities. Examples of toxic air pollutants include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Examples of other air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

Diesel exhaust, which is produced when an engine burns diesel fuel and is commonly found throughout the environment, is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses and cars and off-road diesel engines that include locomotives, marine vessels and heavy duty equipment. Diesel Particulate Matter (DPM) is a complex mixture of thousands of gases and fine particles (commonly known as soot) that contains more than 40 toxic air contaminants. These include many known or suspected cancer-causing substances, such as benzene, arsenic, formaldehyde, and nickel. The sizes of DPM that are of greatest health concern are those that are in the
categorizes of fine and ultra fine particles. The composition of these particles may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements.

As the project alternatives are not anticipated to measurably affect air toxic emissions on either a local or regional basis, an analysis of these emissions is not warranted.

3.5.1.3 POLLUTANTS FOR ANALYSIS

The air pollutants identified as being of concern, and therefore considered for this analysis are as follows:

- CO was identified as a pollutant of concern for the localized air quality analysis of emissions from motor vehicles; and
- CO, NOx, hydrocarbon, and PM10 were studied for project-related changes in regional emissions. These pollutants were considered to determine whether the proposed project alternatives would adversely affect the region’s compliance with the ozone standards.

3.5.2 AIR QUALITY STANDARDS AND REGULATIONS

National Ambient Air Quality Standards (NAAQS) have been established for the following air pollutants: CO, NOx, ozone (O3), particulate matter (PM10 and PM2.5), SO2, and lead (Pb). The State of Hawaii has also established its own standards for these pollutants. Both the National and State Ambient Air Quality Standards are summarized in Table 3.5-1. The "primary" standards have been established to protect the public health with an "adequate margin of safety." The "secondary" standards are intended to protect the nation’s welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare. The State of Hawaii issues its ambient air quality standards in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality."

3.5.3 EXISTING CONDITIONS AND REGULATORY SETTING

Temperatures in Hawaii vary from the mid 20s degrees (°) Celsius (C) in winter to the high 20s C in summer. Thirty-four degrees C and 12° C are the record high and low temperatures recorded at the Honolulu International Airport (HIA). The average annual rainfall recorded at HIA is 59 centimeters (cm). The northeast tradewinds predominate with a frequency of more than 90 percent during the summer. However, light, variable wind conditions are experienced from fall through spring, which is when air quality standards are most likely to be exceeded.

Air pollutant levels in Hawaii are monitored by a network of sampling stations operated by the State of Hawaii Department of Health (HDOH) at various locations around Oahu.
The monitoring locations used for this study are listed in Table 3.5-2, with a summary of the most currently available monitoring results.

Table 3.5-1: National and State Ambient Air Quality Standards

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Nitrogen Dioxide

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Particulate Matter

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PM$_{2.5}$$^a$

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</tr>
<tr>
<td>--</td>
<td>15 ug/m$^3$</td>
</tr>
</tbody>
</table>

PM$_{10}$$^d$

<table>
<thead>
<tr>
<th>24 Hour</th>
<th>Annual (Arithmetic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td>150 ug/m$^3$</td>
</tr>
<tr>
<td>--</td>
<td>50 ug/m$^3$</td>
</tr>
</tbody>
</table>

Ozone

<table>
<thead>
<tr>
<th>1 Hour</th>
<th>8 Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td>157 ug/m$^3$</td>
</tr>
<tr>
<td>235 ug/m$^3$</td>
<td>157 ug/m$^3$</td>
</tr>
</tbody>
</table>

Sulfur Dioxide

<table>
<thead>
<tr>
<th>3 Hour</th>
<th>24 Hour</th>
<th>Annual (Arithmetic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300 ug/m$^3$</td>
<td>365 ug/m$^3$</td>
<td>80 ug/m$^3$</td>
</tr>
</tbody>
</table>

Lead

<table>
<thead>
<tr>
<th>3 Months (Arithmetic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 ug/m$^3$</td>
</tr>
</tbody>
</table>

Notes:
- $^a$ Designated to prevent against adverse effects on public health.
- $^b$ Designated to prevent against adverse effects on public welfare, including the effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials.
- $^c$ Particulate matter which is 2.5 microns or less in diameter.
- $^d$ Particulate matter which is 10 microns or less in diameter.

mg/m$^3$ = milligrams per cubic meter
ug/m$^3$ = micrograms per cubic meter
ppm = parts per million

Source: State of Hawaii, Department of Health, Clean Air Branch, 2003
Table 3.5-2:  
Air Quality Summary for Study Area Monitoring Stations – 2002

<table>
<thead>
<tr>
<th>Air Pollutant</th>
<th>Standard/Exceedance</th>
<th>Honolulu</th>
<th>Kapolei*</th>
<th>Sand Island</th>
<th>West Beach (Ko Olina Golf Course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>Percent Recovery*&lt;br&gt;Max. 1-hour Concentration (mg/m³)&lt;br&gt;Max. 8-hour Concentration (mg/m³)&lt;br&gt;# Occurrences &gt; Federal 1-hour Std. of &gt; 40 mg/m³&lt;br&gt;# Occurrences &gt; Federal 8-hour Std. of &gt; 10 mg/m³&lt;br&gt;# Occurrences &gt; Hawaii 8-hour Std. of &gt; 5 mg/m³</td>
<td>98% 3.99 1.58 0 0 0</td>
<td>NM 2.05 1.64 0 0 0</td>
<td>NM NM NM</td>
<td>99.6% 1.95 0.4 0 0 0</td>
</tr>
<tr>
<td>Ozone (O₃)</td>
<td>Percent Recovery*&lt;br&gt;Max. 1-hour Concentration (µg/m³)&lt;br&gt;Max. 8-hour Concentration (µg/m³)&lt;br&gt;# Occurrences &gt; Federal 1-hour Std. of &gt; 35 µg/m³&lt;br&gt;# Occurrences &gt; Federal 8-hour Std. of &gt; 157 µg/m³</td>
<td>NM NM NM NM</td>
<td>NM NM NM 97%</td>
<td>NM 106 29 0</td>
<td>NM NM NM</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO₂)</td>
<td>Percent Recovery*&lt;br&gt;Annual Arithmetic Mean (µg/m³)&lt;br&gt;% AAM Exceeded (Federal)</td>
<td>NM 70% 9</td>
<td>NM NM</td>
<td>NM 98%</td>
<td>NM 8 0</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO₂)</td>
<td>Percent Recovery*&lt;br&gt;Max. 3-hour Concentration (µg/m³)&lt;br&gt;Max. 24-hour Concentration (µg/m³)&lt;br&gt;Annual Arithmetic Mean (ppm)&lt;br&gt;# Occurrences &gt; Federal 3-hour Std. of &gt; 1300 µg/m³&lt;br&gt;# Occurrences &gt; Federal 24-hour Std. of &gt; 365 µg/m³</td>
<td>97% 30 9 0 0</td>
<td>85% 7 2 0 0</td>
<td>NM 11 2 0 0</td>
<td></td>
</tr>
<tr>
<td>Suspended Particulates (PM₁₀)</td>
<td>Percent Recovery*&lt;br&gt;Max. 24-hour Concentration (µg/m³)&lt;br&gt;# Occurrences &gt; Fed. 24-hour Std. of &gt; 150 µg/m³&lt;br&gt;Annual Mean (µg/m³)</td>
<td>96% 90 0 15</td>
<td>99% 44 0 13</td>
<td>NM 37 0 13</td>
<td></td>
</tr>
<tr>
<td>Suspended Particulates (PM₂.₅)</td>
<td>Percent Recovery*&lt;br&gt;Max. 24-hour Concentration (µg/m³)&lt;br&gt;# Occurrences &gt; Fed. 24-hour Std. of &gt; 65 µg/m³&lt;br&gt;Annual Mean (µg/m³)</td>
<td>95% 53 0 4</td>
<td>49% 15 4</td>
<td>100% 11 5</td>
<td>NM NM NM</td>
</tr>
<tr>
<td>Lead</td>
<td>Maximum Monthly Concentration (µg/m³)&lt;br&gt;# Months Exceeding Federal Std.</td>
<td>NM NM NM</td>
<td>NM NM</td>
<td>NM NM</td>
<td>NM NM NM</td>
</tr>
<tr>
<td>Sulfates</td>
<td>Max. 24-hour Concentration (µg/m³)</td>
<td>NM NM NM</td>
<td>NM NM</td>
<td>NM NM</td>
<td>NM NM NM</td>
</tr>
</tbody>
</table>

*Percent Recovery represents the amount of air quality data reported. 
*The Kapolei station was shut down on 7/15/02 and began operation at a new site on 7/26/02. The results in this table are from the new site, starting 7/26/02. 
NM: Pollutant not monitored
mg/m³ = milligrams per cubic meter
µg/m³ = micrograms per cubic meter
The federal Clean Air Act (CAA) defines non-attainment areas as geographic regions that have been designated as not meeting one or more of the NAAQS. Air quality maintenance areas are regions that have recently attained compliance with the NAAQS. In the year 2002, the most recently available data, the State of Hawaii was in attainment for all federal ambient air quality standards.

3.5.4 METHODOLOGY

The following calculation methods and estimation models were utilized in estimating air quality concentration and project impacts: MOBILE emissions factor model, and the USEPA CAL3QHC dispersion model software.

Analyses were conducted for 2004 existing conditions and for 2025 under future conditions with and without the proposed alternatives. The existing year results are used in conjunction with the results of the future No-Build year to illustrate the predicted air quality trends at the study locations without the project.

Air quality modeling is used to predict pollutant concentrations resulting from emissions of motor vehicles using roadways immediately adjacent to the locations at which predictions are being made. Background levels must be added to these values to account for pollutants entering the area from other sources upwind of the receptors.

A one-hour CO background level of 1.1 parts per million (ppm) and an eight-hour background level of 0.4 ppm were added to the MOBILE source results at each analysis site. These values are the second-highest one-hour and eight-hour readings from the West (Ewa) Beach monitoring station in Honolulu County, for the years 2001 – 2003.

Traffic data for this analysis was derived from traffic counts and other information developed as part of an overall traffic analysis for the project. The microscale CO analysis was performed based on data from this analysis for the peak traffic periods. This is the period when maximum traffic volumes occur on local streets and when the greatest traffic and air quality impacts of the proposed project are expected. The worst case traffic volume was selected and used to represent the future air quality levels with the proposed project.

The microscale mobile source analysis was conducted using the following procedures and assumptions:

Vehicular emissions were estimated using EPA's latest emission factor program, MOBILE6.2.(EPAA420-R-02-08). MOBILE6.2 is a mobile source emission estimate program that provides current and future estimates of emissions from highway motor vehicles. The latest version of MOBILE incorporates updated information on basic emission rates, more realistic driving patterns, separation of start and running emissions, improved correction factors, and changing fleet composition. It also includes the effects of new regulations recently promulgated.
MOBILE source models are the basic analytical tools used to estimate CO concentrations expected under given traffic, roadway geometry, and meteorological conditions. The mathematical expressions and formulations that comprise the various models attempt to describe an extremely complex physical phenomenon as closely as possible. The dispersion modeling program used in this study for estimating pollutant concentrations near roadway intersections is the CAL3QHC (Version 2.0) dispersion model developed by the EPA and released in 1992.

CAL3QHC is a Gaussian model recommended in the EPA Guidelines for Modeling Carbon Monoxide from Roadway Intersections (EPA-454/R-92-005). Gaussian models assume that the dispersion of pollutants downwind of a pollution source follow a normal distribution from the center of the pollution source.

Different emission rates occur when vehicles are stopped (idling), accelerating, decelerating, and moving at different average speeds. CAL3QHC simplifies these different emission rates into two components:

- Emissions when vehicles are stopped (idling) during the red phase of a signalized intersection
- Emissions when vehicles are in motion during the green phase of a signalized intersection

The CAL3QHC (Version 2.0) air quality dispersion model has undergone extensive testing by the EPA and has been found to provide reliable estimates of inert (nonreactive) pollutant concentrations resulting from motor vehicle emissions. A complete description of the model is in the User's Guide to CAL3QHC version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections (EPA-454/R-92-006).

Analysis sites were selected through a screening analysis based on overall intersection volumes, changes in intersection volumes, and changes in Levels-Of-Service (LOS) estimates and community concerns.

Based on the results of the screening analysis, CO levels were estimated at seven intersections including:

1. North-South Road / H-1 Interchange;
2. North-South Road / Farrington Highway;
3. Kapolei Parkway / Renton Road;
4. North-South Road / Kapolei Parkway;
5. Makakilo / H-1 Interchange;
6. Kula / H-1 Interchange; and
7. Fort Barrett Road / Farrington Highway.

The receptors were chosen at these sites in accordance with the guidelines found in the EPA's Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA-454/R-92-005). Figure 3.5-1 shows the seven site locations.
3.5.5 POTENTIAL IMPACTS

Maximum 1-hour and 8-hour CO levels were predicted at the sensitive receptor sites located within the study area (see Figure 3.5-1). The results of this analysis are presented in Tables 3.5-3 and 3.5-4. In summary, no violations of the federal or State one- or eight-hour CO standards are predicted at any of the receptor sites for any of the alternatives.

Table 3.5-3:
Predicted Worst-Case 1-Hour Carbon Monoxide Levels
(parts per million)

<table>
<thead>
<tr>
<th>Site #</th>
<th>Description</th>
<th>Year 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>North-South Road / H-1 Freeway Interchange</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>North-South Road / Farrington Highway</td>
<td>1.5</td>
</tr>
<tr>
<td>3</td>
<td>Kapolei Parkway / Renton Road</td>
<td>1.1</td>
</tr>
<tr>
<td>4</td>
<td>North-South Road / Kapolei Parkway</td>
<td>1.1</td>
</tr>
<tr>
<td>5</td>
<td>Makakilo Drive / H-1 Freeway Interchange</td>
<td>3.7</td>
</tr>
<tr>
<td>6</td>
<td>Kunia Road / H-1 Freeway Interchange</td>
<td>5.2</td>
</tr>
<tr>
<td>7</td>
<td>Fort Barrette Road / Farrington Highway</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Note: State of Hawaii Standard: 9 ppm
      Federal Standard: 35 ppm
      Background level = 1.1 ppm
Source: Parsons Brinckerhoff, Air Quality Technical Report for the North-South Road and Kapolei Parkway Project, July 2004

The State of Hawaii has been classified an attainment area for ozone, PM₁₀ and CO. As an attainment area, the State of Hawaii must demonstrate that the National Ambient Air Quality Standards (NAAQS) will continue to be observed. The microscale analysis for the proposed project demonstrates that no violations of the NAAQS are predicted. The goals set forth in the new Clean Air Act Amendments of 1990 specify that no violations of these standards are created or worsened. The project meets these goals and would not affect the State of Hawaii's current attainment status.

3.5.6 MITIGATION MEASURES

Since there would be no adverse air quality impacts, mitigation will not be necessary.
Table 3.5-4:
Predicted Worst-Case 8-Hour Carbon Monoxide Levels
(parts per million)

<table>
<thead>
<tr>
<th>Site #</th>
<th>Description</th>
<th>Existing</th>
<th>Year 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No-Build</td>
</tr>
<tr>
<td>1</td>
<td>North-South Road / H-1 Freeway Interchange</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>2</td>
<td>North-South Road / Farrington Highway</td>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>3</td>
<td>Kapolei Parkway / Renton Road</td>
<td>0.4</td>
<td>1.2</td>
</tr>
<tr>
<td>4</td>
<td>North-South Road / Kapolei Parkway</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>5</td>
<td>Makakilo Drive / H-1 Freeway Interchange</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>6</td>
<td>Kunia Road / H-1 Freeway Interchange</td>
<td>3.3</td>
<td>2.2</td>
</tr>
<tr>
<td>7</td>
<td>Fort Barrette Road / Farrington Highway</td>
<td>2.6</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Note: State of Hawaii Standard: 4.5 ppm
Federal Standard: 9 ppm
Background Level = 0.4 ppm
Source: Parsons Brinckerhoff, Air Quality Technical Report for the North-South Road and Kapolei Parkway Project, June 2004

3.6 NOISE

3.6.1 BACKGROUND

Noise is defined as any sound that is undesirable or interferes with normal human activities. The decibel (dB) scale is used to quantify sound intensity and represents the ratio between a given sound and the faintest sound detectable by human hearing. Because sound pressure levels vary widely within the range of human hearing, the dB scale is logarithmic. The human ear is not equally sensitive to all frequencies within the entire sound spectrum. Accordingly, noise measurements are made using an A-weighting (dBA) scale to correspond to human perceptions of noise. A-scale sound levels are in current use in many community and city noise ordinances, and many state and city highway or traffic noise codes.

Time variations in noise exposure are typically described as constant energy level equivalent (L_{eq}) for a given time period. L_{eq} is the constant noise level over some specified period of time that is equivalent in energy to a fluctuating (or brief) noise “averaged” over that period of time. L_{eq} is also a function of time and is expressed as L_{eq} (time period). For example, L_{eq}(h), expressed in A-weighted decibels (dBA), is the calculated constant noise over one hour which is equivalent in total energy to the combination of noise levels which were actually measured during that one hour.
### 3.6.2 NOISE STANDARDS

The State of Hawaii Department of Transportation (HDOT) Noise Analysis and Abatement Policy implements the requirements of FHWA regulations on noise impacts (23 CFR 772) approved in December 1996. The policy requires that a noise analysis be performed whenever potentially affected receivers exist in the study area either as developed lands or lands that are planned, designed, or programmed for future use.

Under HDOT policy, a noise impact occurs when the predicted traffic noise levels approach or exceed FHWA's Noise Abatement Criteria (NAC) (see Table 3.6-1), or when the predicted traffic noise levels substantially exceed the existing noise levels.

#### Table 3.6-1: Noise Abatement Criteria (NAC)

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Leq (h) for Noisiest Traffic Hour - dBA</th>
<th>Description of Activity Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>57 (Exterior)</td>
<td>Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of these qualities is essential if the area is to continue to serve its intended purpose.</td>
</tr>
<tr>
<td>B</td>
<td>67 (Exterior)</td>
<td>Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.</td>
</tr>
<tr>
<td>C</td>
<td>72 (Exterior)</td>
<td>Developed lands, properties, or activities not included in Categories A or B.</td>
</tr>
<tr>
<td>D</td>
<td>---</td>
<td>Undeveloped lands</td>
</tr>
<tr>
<td>E</td>
<td>52 (Interior)</td>
<td>Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.</td>
</tr>
</tbody>
</table>

**Source:** State of Hawaii Department of Transportation, "Noise Analysis and Abatement Policy," October 1996

**Notes:**
- Leq(h) is the one-hour energy equivalent sound level.
- Interior noise level standards apply to:
  1. Indoor activities for those parcels where no exterior noise sensitive land use or activities have been identified; and
  2. Situations where the exterior activities are either remote from the highway or shielded so that while the exterior activities remain undisturbed, noise nevertheless affects interior activities.

Under the HDOT noise policy, "approach" is defined as at least 1 dBA less than the NAC, and "substantially exceed the existing noise levels" is defined as an increase of at least 15 dBA. As indicated on Table 3.6-1, the NAC categorizes different types of exterior and interior land use activities. Depending on the activity category, a different NAC would be applied.
3.6.3 EXISTING NOISE CONDITIONS

Existing and future noise sensitive land uses and activities adjacent to the proposed corridor and nearby major roadways were identified from site inspections and existing mapping. These land use activities include residences, recreation and park areas. All of these activities would be considered Category B, and have a NAC of 67 dBA.

Existing noise levels in the project corridor were measured in March of 2004. Noise measurements were taken for 15-minute periods at seven sites, between 11:00 p.m. and 3:00 p.m. and for 24-hours at two additional sites. These sites are representative of existing and future planned noise sensitive land uses in the project study area. The locations of these sites are shown in Figure 3.6-1 and their Leq(h) measurements are provided in Table 3.6-2.

The 15-minute sample is adjusted to peak hour by comparing the measured 15-minute noise level with the closest 24-hour monitoring site during the same hour. The difference is then added to the measured 15-minute level to determine the peak hour noise level. The existing peak hour noise levels at two of the nine receptor sites were above 66 dBA (Table 3.6-2), and therefore exceed the Category B NAC. The noise levels at sites 1 and 2 are due to their close proximity to the H-1 freeway and Palihau Road, which is heavily utilized by heavy trucks for hauling to and from the Grace Pacific quarry, located north of the H-1 freeway.

3.6.4 METHODOLOGY OF IMPACT ANALYSIS

A detailed discussion of the noise impacts of the proposed project is found in Appendix E, Noise Technical Report for the North-South Road and Kapolei Parkway Project (July, 2004). The following information is based on that report.

The noise impact analysis of the proposed project considered future traffic noise impacts for the traffic noise levels along North-South Road under the Build Alternative.

The noise measurement locations are shown in Figure 3.6-1. At those locations adjoining the proposed project, future noise levels with and without the project were predicted using the FHWA Traffic Noise Model - TNM 2.1 (FHWA, 2003).

Input variables to the noise modeling and analysis include traffic volumes, speeds and vehicle fleet mix (auto, medium truck, and heavy truck percentages). The noisiest hour of the day was considered to be when the traffic volume was at its highest, while still operating at the allowable speed limit (LOS C).

3.6.5 POTENTIAL IMPACTS

A noise impact, in terms of the one-hour Leq(h) noise descriptor, could potentially require mitigation when either of the following conditions is predicted to occur:
Noise Measurement Sites
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.6-1
Table 3.6-2: North South Road/Kapolei Parkway 2004 Noise Monitoring Schedule

<table>
<thead>
<tr>
<th>Site No.</th>
<th>LOCATION</th>
<th>Date and Time</th>
<th>Measured Noise Level (Leq)</th>
<th>Adjusted Peak Hour Noise Level (Leq)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>15 minute monitoring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Near H-1 and Palehua Rd. Future Commercial Property.</td>
<td>3/19</td>
<td>68</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1:35 p.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Approximately 100 ft. from Farrington Hwy and Palehua Rd intersection.</td>
<td>3/19</td>
<td>70</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Taken on Farrington Hwy. Current Agriculture Property, Future Residential Area.</td>
<td>(2:19 p.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Near Future Intersection of North-South Road and Kapolei Pkwy. Near Golf Course.</td>
<td>3/19</td>
<td>44</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12:30 p.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Varona Village, in front of Corner Residence facing Kapolei Pkwy on Kahi St.</td>
<td>3/24</td>
<td>55</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(11:39 a.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Varona Village Residence on Renton Rd., near Renton Rd and Kapolei Pkwy intersection</td>
<td>3/24</td>
<td>56</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(11:03 a.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>In front of Town Homes on Kapolei Pkwy between ORSL and Kolowaka Dr</td>
<td>3/18</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(11:18 a.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>In front of Town Homes and Golf Course on Kapolei Pkwy, near the Kolowaka Drive intersection.</td>
<td>3/18</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12:15 p.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>24 hour monitoring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Near H-1 and Palehua Rd. Current Agriculture Property, Future Residential Area.</td>
<td>3/17</td>
<td>NA</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6:00 a.m.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Varona Village. Vacant lot marked by corner of Kahi St. and Lei Aolani Pl</td>
<td>4/27</td>
<td>NA</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4:00 p.m.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Peak hour Noise Level is based on comparing the 15 minute measured noise with the closest 24-hour monitoring location.

Source: Parsons Brinckerhoff, March 2004

- Future year traffic noise level approaches or exceeds the FHWA Noise Abatement Criteria (NAC);
- Future year traffic noise level substantially exceeds (15 dBA or more) the existing ambient noise level.
The predicted Year 2025 traffic noise levels at the noise measurement locations (see Figure 3.6-1) are presented in Table 3.6-3.

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>Existing Peak Hour</th>
<th>LOS C Noise Levels (Leq (dBA))</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Near H-1 and Palioua Rd. Current Agriculture Property, Future Residential Area.</td>
<td>69</td>
<td>No-Build 69 Build 69</td>
</tr>
<tr>
<td>1</td>
<td>Near H-1 and Palioua Rd. Future Commercial Property.</td>
<td>72</td>
<td>No-Build 72 Build 72</td>
</tr>
<tr>
<td>2</td>
<td>Approximately 100 ft. from Farrington Hwy and Palioua Rd intersection.</td>
<td>72</td>
<td>No-Build 72 Build 73</td>
</tr>
<tr>
<td>3</td>
<td>Near Future Intersection of North-South Road and Kapolei Pkwy. Near Golf Course.</td>
<td>53</td>
<td>No-Build 53 Build 65</td>
</tr>
<tr>
<td>B</td>
<td>Varona Village. Vacant lot marked by corner of Kahi St. and Lel Aloa Pl.</td>
<td>64</td>
<td>No-Build 64 Build 65</td>
</tr>
<tr>
<td>4</td>
<td>Varona Village, in Front of Corner Residence facing Kapolei Pkwy on Kahi St.</td>
<td>63</td>
<td>No-Build 63 Build 64</td>
</tr>
<tr>
<td>5</td>
<td>Varona Village Residence on Renton Rd., near Renton Rd and Kapolei Pkwy intersection</td>
<td>63</td>
<td>No-Build 63 Build 64</td>
</tr>
<tr>
<td>6</td>
<td>In front of Town Homes on Kapolei Pkwy between OR&amp;L and Kolowaka Dr.</td>
<td>58</td>
<td>No-Build 68 Build 68</td>
</tr>
<tr>
<td>7</td>
<td>In front of Town Homes and Golf Course on Kapolei Pkwy, near the Kolowaka Dr. intersection</td>
<td>64</td>
<td>No-Build 68 Build 68</td>
</tr>
</tbody>
</table>

Source: Parsons Brinckerhoff, 2004

Under the No-Build Alternative, predicted 2025 traffic noise levels at seven of the nine receptor sites are expected to be no different than their existing peak hour noise levels. Noise levels at Sites A, 1 and 2 will continue to be affected by traffic noise from the H-1 Freeway and Farrington Highway, and noise levels at Site 3 will not be affected by traffic on Kapolei Parkway. For those sites that could be affected by traffic noise emanating from Kapolei Parkway (Sites B, 4 and 5), the physical distance between these sites and the parkway provide enough noise attenuation that noise impacts are not anticipated. Noise impacts in accordance with the HDOT Noise Policy would occur at Sites 6 and 7 if Kapolei Parkway fronting these sites operates at a LOS C. However, Kapolei Parkway in Ewa Gentry is predicted to operate under the No-Build condition better than LOS C even during the peak periods despite the parkway being a contiguous roadway from Ocean.
Pointe to the Villages of Kapolei. Therefore, noise impacts per HDOT Noise Policy would not occur at Sites 6 and 7 under the No-Build Alternative.

Under the Build Alternative, predicted 2025 traffic noise levels at eight of the nine receptor sites are expected to be the same or one decibel higher than the No-Build peak hour noise levels (see Table 3.6-3). Similar to the No-Build Alternative, five of the nine noise sensitive receptors are predicted to have ambient noise levels greater than 67 dBA (NAC for Activity Criterion B) under LOC C traffic conditions at the nearest roadways.

Noise levels at Sites A, 1 and 2 will continue to be affected by traffic noise from the H-1 Freeway and Farrington Highway similar to the conditions under the No-Build Alternative. However, some of these predicted ambient noise conditions might be affected by North-South Road and its interchange with the H-1 Freeway. Nevertheless, noise impacts per HDOT Noise Policy are not rendered because there are immediate plans noise sensitive receptors (e.g., residences) in the areas represented by Sites A, 1 and 2. These areas are anticipated to contain urban land uses in the future according to the Ewa DP (see Section 3.1.2.2b).

Like the No-Build Alternative, noise impacts are not predicted at Sites B, 4 and 5 under the Build Alternative. The alignment of Kapolei Parkway would be the same under both alternatives. Therefore, the physical distance between Sites B, 4 and 5 and the roadway provide enough noise attenuation that noise levels are not expected to rise to a level that noise impacts are rendered.

Site 3 is the only noise sensitive receptor that would be affected only by North-South Road, which is the reason its predicted noise level under LOC traffic conditions is 12 dBA greater than the predicted noise level under the No-Build Alternative and existing level. Nevertheless, noise impacts are not predicted at Site 3 because its predicted noise level is 65 dBA, which does not approach the Activity B NAC.

Noise impacts in accordance with the HDOT Noise Policy would not occur at Sites 6 and 7 because under the Build Alternative, Kapolei Parkway is not predicted to operate at LOS C during the peak periods.

Although only two sites were identified in the area surrounding North-South Road from Farrington Highway to the future Kapolei Parkway, planned land uses in the area include a U.H. West Oahu campus and DHHL homesteads (see Section 3.1.1.2). Without specific land use plans, noise sensitive receptors were not identified for most of these planned developments. Therefore, 65 dBA noise contours or setbacks were modeled for Build Alternative to serve as a guide for future residential development along the alignments of North-South Road and Kapolei Parkway. Table 3.6-4 provides the setbacks, which represent the distance from the roadway centerline where future residential development would not be subject to 66 dBA noise levels under LOS C conditions without noise abatement (e.g., walls or berms). The variations in distances shown on Table 3.6-4 are due to changes in topography. It is recommended that future residential developers consider noise abatement measures if noise sensitive activities, such as residences, are placed within these setback distances.
Table 3.6-4: Recommended Minimum Highway Setbacks for Residential Developments

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Minimum Setback</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1 Freeway</td>
<td>345 feet</td>
</tr>
<tr>
<td>Farrington Highway</td>
<td>145 to 155 feet</td>
</tr>
<tr>
<td>Kapolei Parkway</td>
<td>95 to 100 feet</td>
</tr>
<tr>
<td>North-South Road</td>
<td>200 to 220 feet</td>
</tr>
</tbody>
</table>

Source: Parsons Brinckerhoff, 2004

3.6.6 NOISE ABATEMENT MEASURES

If traffic noise impacts are identified, HDOT's Noise Analysis and Abatement Policy is used to determine whether noise abatement measures will be implemented, depending on whether these measures are reasonable and feasible based on the following criteria:

- Provide a minimum noise reduction of 5 dBA.
- Cost of noise abatement not to exceed $35,000 per residence benefited.
- Number of residences protected will include all dwelling units - owner occupied houses, rental units, mobile homes, etc. All units benefited by a 5 dBA or more noise reduction will be counted regardless of whether or not they were identified as impacted.
- Views from residences that would be affected by traffic noise are a major consideration in the reasonableness of noise abatement measures such as noise walls.
- Residential areas where future traffic noise levels are greater than 70 dBA or 20 dBA higher than existing noise levels will be given greater consideration.
- Residential areas along highways in a new location and residential areas constructed before an existing highway will be given greater consideration.

Noise barriers are considered at sites where noise levels approach or exceed the NAC of 67 dBA or if future year traffic noise substantially exceeds (15 dBA or more) the existing ambient noise level. Noise abatement would only be considered at existing residential or planned development sites where building permit approvals have been obtained, and would only apply to outdoor ground level areas (HDOT Noise Policy).

For the Build Alternative, noise impacts are not predicted at any of the noise sensitive receptors analyzed. Therefore noise abatement is not required.
3.7 ECOSYSTEMS

3.7.1 REGULATORY REQUIREMENTS

Section 7 of the Endangered Species Act of 1973 requires federal agencies to consider impacts on endangered or threatened species and critical habitat of such species. For terrestrial species, it requires that federal agencies consult with the U.S. Fish and Wildlife Service (Service) and prepare a Biological Assessment (BA) to address the effects of any major construction activity on a listed species or species proposed as endangered, or result in the destruction or adverse modification of designated critical habitat. Subsequently, a Biological Opinion (BO) is to be rendered by the Service stating whether or not the federal action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat (40 CFR 402).

The State's counterpart law is Chapter 195D, Hawaii Revised Statutes (HRS), as amended, under which species are similarly protected. Chapter 195D stipulates that where there may be an incidental take of a listed species, a Habitat Conservation Plan (HCP) must be "designed to result in an overall net gain in the recovery of Hawaii's threatened and endangered species." (emphasis added)

The remainder of this section discusses the impact to biological resources in this regulatory context.

3.7.2 EXISTING CONDITIONS

3.7.2.1 ZOOLOGY

A zoological technical report prepared for this project (see Appendix G) reviewed several biological studies addressing housing developments in the area (East Kapolei Master Plan EIS, 1995; Ewa By Gentry EIS, 1988, 1995; Ewa Marina Phase II EIS, 1991; and Ewa Villages Master Plan EIS, 1991). Habitats that would be crossed by the proposed North-South Road and portion of Kapolei Parkway between Renton Road and North-South Road are the same as or similar to the habitats surveyed for these developments. Therefore, given this project's proximity and similarity to areas that were surveyed, and findings of only relatively common animals adapted to urban conditions, a new faunal survey was not conducted for this project.

The studies concluded that the faunal community in the project area is typical of abandoned sugarcane fields near urban areas on Oahu. Common animals include mice, mongooses, rats, a variety of birds, feral cats, and dogs (see Table 3.7-1). The studies cited above concluded that the area has been extensively modified from its original state and has little value as native bird habitat. These studies did not report evidence of threatened or endangered faunal species. For a discussion of a potential listed insect in the project area, see Section 3.7.2.3.
Table 3.7-1:
Animals Observed During Zoological Surveys in the Project Vicinity

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Rat</td>
<td>Rattus norvegicus</td>
</tr>
<tr>
<td>House Mouse</td>
<td>Mus musculus domesticus</td>
</tr>
<tr>
<td>Feral Dog</td>
<td>Canis familiaris</td>
</tr>
<tr>
<td>Feral Cat</td>
<td>Felis catus</td>
</tr>
<tr>
<td>Mongoose</td>
<td>Herpestes auropunctatus</td>
</tr>
<tr>
<td>Birds</td>
<td></td>
</tr>
<tr>
<td>House Sparrow</td>
<td>Passer domesticus</td>
</tr>
<tr>
<td>Red Avadavat or Strawberry Finch</td>
<td>Amanda amandava</td>
</tr>
<tr>
<td>Warbling Silverbill</td>
<td>Lorchura malabarica</td>
</tr>
<tr>
<td>Chestnut Mannikin</td>
<td>Lorchura malacca</td>
</tr>
<tr>
<td>Nutmeg Mannikin</td>
<td>Lorchura punctata</td>
</tr>
<tr>
<td>Java Sparrow</td>
<td>Padda oxyzvora</td>
</tr>
<tr>
<td>Northern Cardinal</td>
<td>Cardinals cardinalis</td>
</tr>
<tr>
<td>Brazilian Cardinal</td>
<td>Pavoaria coronata</td>
</tr>
<tr>
<td>Red-Vented Bulbul</td>
<td>Pycnonotus cafer</td>
</tr>
<tr>
<td>Cattle Egret</td>
<td>Bubulcus ibis</td>
</tr>
<tr>
<td>House Finch</td>
<td>Carpodacus mexicanus</td>
</tr>
<tr>
<td>Lesser or Pacific Golden Plover</td>
<td>Puvialis dominica fulva</td>
</tr>
<tr>
<td>Spotted Dove</td>
<td>Streptopelia chinensis</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>Columba livia</td>
</tr>
<tr>
<td>Zebra Dove</td>
<td>Geopelia striata</td>
</tr>
<tr>
<td>Mockingbird</td>
<td>Mimius polyglottos</td>
</tr>
<tr>
<td>Common Myna</td>
<td>Acridotheres tris</td>
</tr>
<tr>
<td>Ring-Necked Pheasant</td>
<td>Phasianus colchicus</td>
</tr>
<tr>
<td>Common Waxbill</td>
<td>Estrilda astrid</td>
</tr>
<tr>
<td>White-Rumped Shama</td>
<td>Copsychus malabaricus</td>
</tr>
<tr>
<td>Eurasian Skylark</td>
<td>Alauda arvensis</td>
</tr>
<tr>
<td>White-Eyes</td>
<td>Zosterops japonicus</td>
</tr>
</tbody>
</table>

Sources: Ewa Borac Master Plan EIS, 1995; Ewa By Gentry EIS, 1988, 1991; Ewa Marine, Phase II EIS, 1991; Ewa Villages Master Plan EIS, 1991.
3.7.2.2 BOTANY

The following discussion is based on botanical surveys of the North-South Road Corridor area and the portion Kapolei Parkway between Renton Road and North-South Road Corridor area that were conducted by Kenneth Nagata (1996) and Char & Associates (1996, 1997, 2003, 2004). No wetlands occur in the proposed project footprint (see Section 3.8).

3.7.2.2a North-South Road Corridor

A botanical survey of about 1,300 acres of undeveloped land surrounding the North-South Road corridor was conducted in June 1996 (see Char & Associates, 1996, Appendix H). The primary objectives of the survey were to: 1) describe the vegetation; 2) inventory the flora; 3) search for threatened and endangered species as well as rare and vulnerable plants; and 4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

The survey found that all land within the corridor has been disturbed, and its vegetation consists almost exclusively of introduced or alien species. The corridor crosses primarily former sugarcane lands now overgrown with weedy plants, koa haole (Leucaena leucocephala) scrub, and mixed scrub typical of fallow croplands. Several decades of large-scale sugar cultivation removed almost all native cover, as sugarcane fields replaced vast tracts of forest and shrubland. Vertical plowing and drainage ditches encouraged erosion from the lower Waianae slopes and soil deposition on the lower plains.

The survey inventoried a total of 72 plant species within the corridor, of which 68 (95 percent) were introduced, one (1 percent) originally of Polynesian introduction, and three (4 percent) native. The three native species—illima (Sida falax), popolo (Solanum americanum), and uhelos (Waltheria indica)—are all indigenous or presumably indigenous species, meaning they occur naturally in the Hawaiian Islands and also elsewhere throughout the Pacific and/or tropics. None of the plants initially inventoried in the November 1996 report is a listed, proposed, or candidate threatened or endangered species, nor a species of concern or a rare and vulnerable plant.

Other botanical studies on the Ewa Plain during the 1980’s and 1990’s recorded findings similar to those above (botanical surveys for Ewa Marina Community project site (September 1980), Ewa Gentry Residential Community (January 1988), and Launani/Fairways Subdivision (August 1991)).

The results of the 1996 survey were amended in October 1997, after a population of endangered Koolaula (Abutilon menziesii) was identified in the corridor during a subsequent survey for the East Kapolei Master Plan project by the State’s HCDD (Nagata, 1996). The HCDD project is no longer planned. Koolaula is discussed in more detail in Section 3.7.2.3.

Since the discovery of the Koolaula, additional monitoring has been actively conducted in the project area by the State of Hawaii Department of Land and Natural Resources,
Division of Forestry and Wildlife (DLNR - DOFAW), while a HCP was prepared pursuant to the State's endangered species law. To date, no other listed, proposed, or candidate threatened or endangered plant has been discovered. Therefore, no further botanical surveys were conducted for the North-South Road corridor.

3.7.2.2b Kapolei Parkway Corridor

At the City's request that the Kapolei Parkway project from Renton Road to the North-South Road also be included in the HCP, a regional document covering development in the East Kapolei area, an additional botanical survey was conducted in January 2004 on the undeveloped City-owned property surrounding the portion of Kapolei Parkway from Renton Road to North-South Road. The 81-acre City property consists in large part of undeveloped land adjacent to the existing Ewa Villages Golf Course. This survey report (Char & Assoc., March 2004) is included in the HCP in Appendix H. The objectives of the study were primarily to inventory the Koolauloa on that property, characterize the overall vegetation, and determine if other listed species exist in the area.

Dominant vegetation consisted of koa haole, buffel grass (Cenchrus ciliaris), swollen fingergrass (Chloris barbata), kiawe (Porsopis palicola), and other common weedy plants. The edge of the Ewa Villages Golf Course is dense with woody plants including tall thickets of koa haole, with emergent stands of kiawe, monkeypod (Samanea saman), eucalyptus, and opium (Pithecellobium dulce) trees. The area closer to Varona Village is characterized by vegetation found at old house sites, such as mango (Mangifera indica) and kalamungai (Moringa oleifera) trees.

The survey identified a total of seven Koolauloa plants within the roughly 81-acre City property. The findings of the survey are discussed in more detail in Section 3.7.2.3. The survey did not identify any other listed threatened, endangered, or candidate species.

3.7.2.3 ENDANGERED AND THREATENED SPECIES

Initial attempts to identify potential endangered or threatened species in the project area involved the botanical surveys mentioned above and correspondence with resource agencies. Letters were sent to the Service and DOFAW (see Appendix A).

In a letter dated February 1, 1996 (see Appendix A), the Service noted that the proposed project area had been extensively modified by agricultural and development activities. However, the Service stated that there are historical records of the following Federal Trust Species in the vicinity of the proposed corridor, which could be affected by the North-South Road project:

- Centaurium sebaceoides (listed Endangered)
- Marsilea villosa (listed Endangered)
- Portulaca villosa (Species of Concern)
- Toruliniun odoratum ssp. auriculatum (Species of Concern, very possibly extinct)
- Pentanthrum obscurum (Species of Concern)
A botanical survey conducted for the proposed project in 1996 (see Appendix H) did not find any of the plant species identified by the Service.

In a letter dated June 13, 1996, the Service stated that the *Pentarthurum obscurum*, a type of beetle, is more common than previously believed and may not even be native to the Hawaiian Islands. The Service recommended that no surveys for this beetle be performed in the project area during the environmental review process. In a letter dated October 10, 1997, the Service stated that *Centaurium sebaeoides*, *Marsilea villosa*, *Portulaca villosa*, and *Torrilium odoratum* "is not be subject to consultation" because botanical surveys did not find these species in the project area.

Therefore, none of the five Federal Trust Species initially identified by the Service in 1996 would be affected by the proposed project, because they do not occur on the project site. Therefore, they are not subject to Section 7 consultation nor any further regulatory action under HRS Chapter 195D.

In a letter dated March 3, 2004, the Service confirmed that the *Abutilon menziesii* (Koolaula) is the only endangered species located within the proposed project footprint. There are no other species proposed for listing, or proposed or designated critical habitat within the project area.

*Koolaula (Abutilon menziesii)* is a shrub of the mallow family, growing six to eight feet tall, with coarsely-toothed, silvery, heart-shaped leaves that are about one to three inches long. The flowers are medium red to dark red and less than an inch in diameter. Koolaula has been sold as an ornamental plant at local nurseries in the past under the name "Red Ilima". Plants reportedly thrive and bloom regularly under nursery conditions and propagation by seed and cuttings is successful. Other populations of Koolaula currently exist on Lanai and Maui.

During a late 1996 survey, a population of Koolaula was found on former sugarcane land at Kapolei in Ewa on the subject property (Nagata, 1996). Hence, this population is hereafter referred to as the "Kapolei population", and the lands on which they have been identified are collectively called the "Kapolei property" in this discussion. The Kapolei property consists of 1,300-acres of State-owned property and an adjacent 81-acre City property, including the North-South Road and portion of Kapolei Parkway footprints. These former sugarcane fields are now overgrown with scattered clumps of sugarcane and weedy species commonly associated with fallowed agricultural lands. The known plant locations on the Kapolei property are shown in Figure 3.7-1.

Koolaula is protected by both the federal Endangered Species Act of 1973, as amended, and Chapter 195D, HRS, as amended. Prior to the 1996 Nagata survey, the Koolaula had not been identified in the Ewa area, and therefore was not noted by the Service during preceding coordination efforts (see Appendix A). Since the discovery of the plant on the Kapolei property, additional botanical surveys in this area have been conducted by Char & Associates (1996, 1997, 2003, 2004). These reports are contained in Appendix H, either individually or as appendices within the HCP, also provided in Appendix H. No other federal or state listed species was found during these surveys.
The discovery of the Kapolei population was unexpected because the Kapolei property was used for sugarcane cultivation for nearly a century, until the closure of Oahu Sugar Company in 1995. The cane harvesting process involved burning cane fields to reduce leaf bulk before the stalks were mechanically harvested; therefore, the Kapolei property was repeatedly exposed to cane fires during this period. Sugarcane was reportedly last harvested on the property in 1994, or about two years before the discovery of Koolaula.

The Koolaula plants at Kapolei are found in five clusters in the central and southern portions of the area: Clusters A, B, C, D, and E (Figure 3.7-1). According to DLNR, the present number of plants has been reduced to between 30 and 50 through attrition, but new seedlings have also recently been recorded. While the population size is dynamic, the generally accepted baseline number of plants in the Kapolei property, as reported in the HCP, is 93 individuals. Of these, 86 occur in the State-owned portion and seven in the City-owned portion of the Kapolei property. A December 1997 survey produced taxonomic data and precise mapping of the plants; DLNR subsequently mapped their locations using global positioning system (GPS) technology (see HCP in Appendix H).

Development of the HCP for the Kapolei population has been on-going since the first Draft EA for the North-South Road was published in 1996. Prepared pursuant to HRS Chapter 195D-21, the recently completed HCP describes the current status of the listed species, the development actions proposed on the Kapolei property, their impacts on the Kapolei population, and proposed mitigation strategies to further the recovery of the species. Further details about the HCP are provided in Sections 3.7.3.2 and in Appendix H.

While the HCP was being prepared, a pilot program to protect the species and prepare them for eventual relocation was implemented. On behalf of HDOT and former East Kapolei Master Plan developer HCDCH, DLNR-DOFAW initiated the Interim Management Plan (IMP) for the Koolaula in 1998. The IMP tested whether new populations could be established from Kapolei stock of Koolaula. A complete representation of 630 plant progeny were successfully propagated from the Kapolei population and outplanted at Koko Crater Botanical Gardens, Kaena Point State Park, and the Honolulu Unit of the Pearl Harbor National Wildlife Refuge. As part of this IMP, DOFAW also updated the inventory of Koolaula and mapped their locations. Therefore, the genetic material of all surviving Kapolei plants have been successfully preserved by DLNR for eventual outplanting at other sites. Draft and final IMP reports (dated 2001 and 2003, respectively) are included in the HCP in Appendix H.

Pursuant to the State Endangered Species Act (HRS Chapter 195D), a Habitat Conservation Plan for Abutilon menziesii at Kapolei (HCP) was finalized and approved by the State's Board of Land and Natural Resources (BLNR) in March 2004. The HCP was closely coordinated with the Service, and the HCP was submitted to the Service on March 23, 2004, as the BA to initiate "formal consultation" with the Service under Section 7 of the Endangered Species Act.

The primary objective of the HCP is the continued survival of the Kapolei genetic stock of the Koolaula through the establishment of three offsite wild populations and one offsite repository site from the degraded canefield population at Kapolei. To achieve this goal,
Distribution of the Endangered Plant Kooloaula (Abutilon menziesii)
North-South Road and Kapolei Parkway Project
Final Environmental Assessment
Figure 3.7-1
more than three sites will be outplanted, managed, and monitored for a period of five years before a determination is made whether a site has met defined success criteria. The ultimate objective is to achieve three successful outplanting sites.

The short- and long-term goals are summarized in Table 3.7-2.

### Table 3.7-2:

**Short-term and Long-term Goals of the Habitat Conservation Plan**

<table>
<thead>
<tr>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-Term Goals</strong></td>
</tr>
<tr>
<td>1) Propagate original Kapolei population of <em>Abutilon menziesii.</em></td>
</tr>
<tr>
<td>2) Establish a cultivated repository of Kapolei <em>A. menziesii</em> at Koko Crater Botanical Garden.</td>
</tr>
<tr>
<td>3) Establish two test outplantings of <em>A. menziesii</em> at appropriate sites.</td>
</tr>
<tr>
<td>4) Represent complete genetic diversity of original population at all sites.</td>
</tr>
<tr>
<td>5) Establish and maintain an 18-acre contingency reserve area within the Kapolei population until the short-term success criteria are met at one wild outplant site.</td>
</tr>
<tr>
<td><strong>Long-Term Goals</strong></td>
</tr>
<tr>
<td>1) Maintain three new stable populations of <em>A. menziesii</em> by out-planting at several (more than three) appropriate sites.</td>
</tr>
<tr>
<td>2) Maintain an effective population of 120 flowering and seed producing plants (minimum of 100 mature individuals) over the term of the HCP. This number will assure an approximate 75 to 100 percent increase of the original population in each location and is five times that recommended by the Hawaii and Pacific Plants Recovery Coordinating Committee (as cited in USFWS 1998).</td>
</tr>
<tr>
<td>3) Monitoring of the populations will be conducted to determine progress toward attaining population stability.</td>
</tr>
<tr>
<td>4) The goal for seedling survival rate will be on average in the 10 - 25 percent range over a five year period taking into consideration the many variables related to achieving stability of reintroduced populations. “Survival rate” is defined as survival of individual plants for a minimum of one year.</td>
</tr>
<tr>
<td>5) Natural recruitment in all populations.</td>
</tr>
</tbody>
</table>


### 3.7.3 POTENTIAL IMPACTS

#### 3.7.3.1 ZOOLOGY

The No-Build Alternative would convert some habitat to the future Kapolei Parkway.

The Build Alternative would convert additional habitat into a roadway (habitat within the footprint of North-South Road). However, it would not threaten the relatively common faunal communities in this region because the animals present, such as cats, mongooses, and mice, are considered nuisances and easily adapt to the urban environment. The environmental documents prepared for proposed housing developments in the general vicinity of the proposed roadway reported similar findings. Future development adjacent to the corridor (see Section 3.1) would destroy existing faunal habitats but new habitats would be re-established within the development. Under
all the alternatives, it is anticipated that the number of animals killed on the roads in the area would increase due to urban development.

3.7.3.2 BOTANY

As described in Section 2.2, the No-Build Alternative assumes that Kapolei Parkway would be constructed, but at a later date than under the Build Alternative. The No-Build Alternative would necessitate clearing vegetational communities within the Kapolei Parkway Corridor.

The Build Alternative would clear vegetation in both the North-South Road Corridor and the Kapolei Parkway Corridor between Renton Road and North-South Road (see Chapter 2 for the areas affected).

With the exception of the endangered plant Kooloaula (Abutilon menziesii), the botanical surveys conducted for this project (see Appendix H) stated that the project corridor is overgrown with weedy plants. Koa haole scrub and mixed scrub, and is composed almost exclusively of introduced or alien species. Therefore, the vegetational communities that would be cleared by construction activities under any alternative are not considered regionally important.

The only listed threatened or endangered species known to occur on the project site is the endangered Kooloaula. The remainder of this section deals with the impacts to Kooloaula and the HCP prepared for the Kapolei population of this species.

3.7.3.2a Kooloaula

The endangered Kooloaula is the sole subject of federal Section 7 consultation and is also subject to the requirements of Chapter 195D because it occurs on the project site and the proposed project would result in an adverse impact to this species.

As described in Section 3.7.1, five clusters of the endangered plant Kooloaula (Abutilon menziesii) were identified at or near the proposed roadways (see Figure 3.7-1). The baseline size of the population is assumed to be 93 individuals.

The No-Build Alternative would require removal of three endangered Kooloaula plants on City property within the ROW of the Kapolei Parkway corridor from Renton Road to North-South Road.

The Build Alternative would have both direct and indirect impacts on the plant population. Direct impacts would consist of removal of a total of 24 plants in both the North-South Road Corridor and Kapolei Parkway Corridor between Renton Road and North-South Road. Of these, 21 plants would be affected by North-South Road and its drainage features, while the other three would be the same as those affected under the No-Build Alternative. The proposed North-South Road ROW is currently owned by the State and the Estate of James Campbell; Kooloaula is present only on the State-owned portion.
The remaining plants in Ewa and Kapolei would not be directly affected by the project. Potential indirect impacts to these remaining Kooloaula include wildfires and increased air pollution, which are associated with more urbanization and construction activities. In order to avoid these indirect impacts, propagules from these remaining plants will be grown and represented in three offsite locations, including the Koko Crater Botanical Garden, Kaena Point State Park and Honolulu National Wildlife Refuge on Oahu (see HCP). In addition, the HCP foresees the removal of the entire Kapolei population of Kooloaula. These plants may be transplanted to other “wild” site locations. Section 3.7.4.2 describes mitigation measures in the HCP that will preserve the genetic composition of this endangered species.

Because take of Kooloaula was anticipated, informal Section 7 consultation was initiated in September 1997. Milestones identified through informal consultation included completion of the HCP, and its submittal as part of the BA, per 50 CFR 402.12. The State’s Endangered Species Recovery Committee (ESRC) recommended approval of the HCP to the BLNR on March 12, 2004; BLNR then approved the HCP on April 8, 2004. The HCP could not have been approved by BLNR unless it demonstrated that the plan would result in a net gain for the species, per the requirement of HRS Chapter 195D.

FHWA submitted the HCP/BA to the Service and initiated formal consultation on March 23, 2004. Due to the close coordination with the Service during the development of the HCP, the Service has issued a biological opinion (BO) stating that the proposed project is not likely to jeopardize the continued existence of the Kooloaula. The BO is included in Appendix A.

While there would be an immediate adverse effect on individuals in the roadway ROW, implementation of the HCP, which has already begun, is an integral part of the proposed action. The HCP is anticipated to result in a net gain for the species. Therefore, the action, as mitigated per the HCP, should not result in substantial adverse impact to the species.

3.7.3.2b HCP Provisions

According to the HCP and the corresponding Incidental Take License (ITL) issued by DLNR-DOFAW, plants to be removed have been or will be propagated in a nursery and transplanted to another location. Three “wild” outplanting sites will be established and managed by DOFAW, on behalf of HDOT. Some plants may temporarily be placed in the 18-acre contingency reserve area (CRA), which is established along the southern end of the North-South Road Corridor. The CRA was selected because the highest concentration of Kooloaula occurs there. The CRA will be maintained until one outplanting site established under the HCP achieves defined short-term success criteria. Figure 3.7-1 shows the location of the CRA in relation to the proposed action.

The duration of the active management period specified in the HCP is 20 years. The plan is tied to the accomplishment of measurable goals including establishment of three successful outplant populations. The successful implementation of the HCP would increase the number of new plants on Oahu, and improve their setting in comparison to their current setting in a disturbed, abandoned canefield. DLNR-DOFAW is
implementing the HCP on behalf of HDOT, under the terms of a Memorandum of Agreement.

The following is a summary of some of the key HCP measures which the HDOT commits to implement through DLNR-DOFAW:

- Actively monitor, manage, and propagate the Kapolei population to protect the genetic resource over a 20-year period;
- Establish at least three "wild" or self-sustaining sites to preserve genetic material of all individuals;
- Provide $1 million in funding for management of the "wild" sites;
- Allow for long-term management of the Koolaula beyond the 20-year period, if necessary;
- Establish a $200,000 contingency fund to pay for unforeseen expenses in Koolaula management;
- Establish an 18-acre "CRA" where existing Koolaula in their native habitat can remain undisturbed and protected, until a "wild" site meets pre-defined short-term success criteria; and
- Implement adaptive management measures, as necessary.

It should be noted that the HCP covers a broader geographic area than the footprint impacts of the North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road. HDOT decided to sponsor the HCP after the HCCCH elected not to pursue development in East Kapolei, but the Service stated during pre-consultation in 1998 that mitigation for the road should address impacts on the full Kapolei population. Future development abutting these roads (see Section 3.1) would clear similar vegetational communities, including the Koolaula. Therefore, the HCP foresees and permits the entire Kapolei population to be removed eventually through the planned growth of Kapolei as the Second City.

The HCP outlines a Certificate of Inclusion (COI) process allowing third party developers, such as the City, UH-West Oahu, and DHH, to participate in the provisions of the ITL when they are ready to construct their projects and will need to "take" Koolaula. HDOT has committed to administering the ITL for the Kapolei population. HDOT has also committed to provide a contingency fund of $200,000. It is anticipated that other developers will participate in the contingency fund. For more details, see the HCP in Appendix H.

3.7.4 MITIGATION MEASURES

3.7.4.1 ZOOLOGY

No negative impact to zoological resources is expected as a result of the proposed action, so no mitigation measures are necessary.
3.7.4.2 BOTANY

No mitigation measures are necessary for the removal of vegetation, but the project action includes providing landscaping to replace some of the lost vegetation and improve the physical appearance of the roadway. The landscaping plan may include cultivated Koolaula, where feasible. Details of the highway landscaping plan will be developed during the project’s design phase. Use of plants that would minimize water requirements will be considered in the preparation of the landscaping plan.

Mitigation actions for the affected Koolaula are described in detail in the HCP, as summarized in Section 3.7.3.2. HDOT commits to implementing the terms of the HCP over the course of 20 or more years, as necessary. These mitigation measures, summarized above and elaborated in the BAH/CP, would reduce the potential for adverse impacts on Koolaula, would potentially help the overall recovery of the species, and would not compromise the continued existence or recovery of the listed species.

In addition, the construction contractor will be required to initiate fire prevention measures during roadway construction to minimize the indirect impact associated with fire risk. Measures will include the preparation of a specific Fire Control Plan by the contractor. The Fire Control Plan will address such topics as construction of a firebreak, presence of a water truck at all times, construction worker education, reporting, and response procedures in the event of a fire, and procedures for the storage and disposal of flammable materials, including matches and cigarettes.

On August 5, 2004, the Service notified FHWA of its biological opinion that the proposed project with mitigation measures specified in the HCP/BA is not likely to jeopardize the continued existence of the endangered Koolaula. Even though the implementation of all proposed Kapolei projects (including but not limited to North-South Road and Kapolei Parkway) would remove the entire Kapolei population of Koolaula, the Service determined that the population is unlikely to persist over time without management, due to habitat degradation, encroaching development, and the threat of fire. Therefore, the Service concluded that implementation of the HCP would result in a net conservation benefit for Koolaula.

In addition, the Service made the following conservation recommendations:

- that research regarding the physical and biological needs, pests, and diseases of Koolaula be conducted in order to gain better understanding of the Koolaula, which will aid in the successful implementation and outcome of the proposed project;
- that efforts be made to collect the seed bank for use at outplanting sites; and
- that the Service be notified of the implementation of any conservation recommendations.

The FHWA will re-coordinate with the Service if an unforeseen event occurs that significantly changes the baseline of the species. The completion of the BO completes the formal Section 7 consultation process, as outlined in Chapter 4. The BO is included in Appendix A.
3.8 WATER RESOURCES

3.8.1 EXISTING CONDITIONS

3.8.1.1 GROUNDWATER

Groundwater in Oahu occurs in perched water tables, deep basalt aquifers, and shallow aquifers within the caprock. Potable, artesian groundwater underlying the project area occurs in the Southern Oahu Basal Aquifer (SOBA), which is a Sole Source Aquifer designated by the Environmental Protection Agency (EPA). The portion of the SOBA underlying the proposed project is part of the Pearl Harbor aquifer sector, which serves as one of the main sources of drinking water for Oahu’s population. The fresh water in the basal aquifer is recharged in the Waianae Mountains and the central plain by direct rainfall, infiltration of stream runoff, and irrigation water.

The SOBA is under artesian pressure in the porous basalt below the caprock, a wedge of alluvial sediments and limestone. The limestone caprock aquifer is generally too saline for potable use and is used mainly for irrigation and industrial purposes. The caprock aquifer is recharged by rainfall, stream infiltration, seawater intrusion, irrigation return, and basaltic aquifer leakage. The caprock layer thins with distance from the shoreline, and at varying distances inland, the caprock layer ends, and the basalt layer, containing the potable aquifer, underlies surgical materials. The caprock boundary lies approximately 1,000 to 1,500 feet south of North-South Road’s intersection with Farrington Highway.

3.8.1.2 SURFACE WATER AND FLOODPLAINS

The Ewa region is in the rain shadow of Oahu’s mountain ranges and is therefore generally dry. Annual rainfall in the region averages about 20 inches. Most of the rainfall occurs during southerly (Kona) storms, which can be short, high intensity events.

There are no permanent surface water bodies within or near the proposed corridor. Intermittent streams carry some of the regional drainage. The largest intermittent stream in the roadway corridor is Kaloi Gulch. However, according to the DLNR Commission on Water Resource Management (correspondence dated July 28, 2004), Kaloi Gulch is not considered a "stream" in accordance with the Hawaii Water Code. The Kaloi Gulch watershed extends from the crest of the Waianae Range to the shoreline, and encompasses approximately 11 square miles (see Figure 3.8-1). Flows are contained within a natural channel above the H-1 Freeway. A box culvert under the H-1 Freeway is sized to contain runoff from the Federal Emergency Management Agency (FEMA) 100-year storm. (Two design storms have been considered in project planning: the FEMA 100-year design storm and the City Design Flow. The City Design Flow exceeds the FEMA 100-year storm. Zoning decisions are based on the City Design Flow.) Makal of the H-1 Freeway the flows are contained within constructed levees.
Gulch channel prevent runoff that is generated outside the channel from entering the Hunehune Gulch, another intermittent stream, conveys drainage from northwest of the proposed roadway and joins Kaloi Gulch below Farrington Highway.

Because the capacity of these intermittent streams is limited, they overflow makai of Farrington Highway during high intensity rains. The broad flood plain makai of Farrington Highway is characterized by generally unimpeded sheet flows less than 1-foot in depth extending to Ewa Villages. There may be some depressed areas where sheet flow depths could exceed one foot. Additionally, the levees along the Kaloi channel, adding to the volume of sheet flow.

Since the reach of Kaloi Gulch between Farrington Highway and Ewa Villages extends across areas previously used for sugarcane cultivation, and this area is still vacant or used for other agricultural activities. Therefore, the risk of flood damage is small. Additionally, sheet flows in these areas helped to disperse flows and filter sediments from the storm water.

In Ewa Villages, however, flood control issues have been a concern. The OR&L railroad track berm acted as a dam, impounding sheet flows from mauka areas that overtopped the intermittent streams. The railroad track made Ewa Villages a retention basin and was the usual cause of flooding in Ewa Villages.

The OR&L impoundment also protected downstream landowners from smaller storm events.

After a declared federal flood disaster in 1996, a regional drainage plan for the Ewa Plain was reviewed by the State of Hawaii National Floodplain Insurance Program (NFIP) Coordinator and FEMA. Flood hazard mitigation proposals were submitted to FEMA by the City to improve regional drainage north of Ewa Villages. One of the proposals was construction of a basin similar to the one now proposed for the North-South Road drainage system (discussed later). Since FEMA did not provide grants to construct the flood hazard mitigation projects, mitigation was left to the landowners and the City.

To help catalyze Kapolei development, the State’s East Kapolei Project, proposed by the State Housing Finance Development Corporation (HFDC) in 1997, was designed to develop the regional drainage system from H-1 Freeway to Ewa Villages. The need for housing was so great that the Housing and Community Development Corporation of Hawaii (HCDC) (HFDC had been disbanded and replaced by HCDC) intended to build the drainage system in association with home construction, prior to the construction of North-South Road. The conveyance spine was to be a re-aligned Kaloi Gulch adjacent to the future North-South Road that would link a series of retention/detention basins. Excavation from the re-aligned gulch and basins was to be used as fill to elevate the adjacent developments. The East Kapolei Environmental Impact Statement, which described the proposed drainage plan, was reviewed and approved by the City and State NFIP Coordinator. The State Land Use Change Petition approval for the East Kapolei project, granted by the Land Commission, was based on the East Kapolei Drainage Master Plan as disclosed in the EIS. Subsequently, the Drainage Master Plan for the East Kapolei Project was undergoing review by the City,
but the project stopped before it was approved because of changes in the housing market.

In the absence of the HCDDCH to construct the regional drainage system, the Kaloi Gulch Technical Committee was reconvened to address regional storm water issues in a phased manner, thereby allowing the urbanization of the area to proceed. The Technical Committee consists of public and private interests. The City's Department of Planning and Permitting (DPP) represents the City on the Committee. As the agency with regulatory oversight of drainage on Oahu, DPP reviews and approves drainage master plans of area developments for compliance with the City's Flood Ordinance (Ordinance 99-12, effective May 10, 1999), Drainage Standards and the Interim and Ultimate regional drainage criteria of the Kaloi Gulch Technical Committee. The City's Flood Ordinance must be consistent with the flood plain management regulations of the NFIP for the City to remain a participant in the federal flood program.

The Kaloi Gulch Technical Committee has developed criteria for interim and ultimate regional drainage improvements in the Kaloi Gulch Basin. Phased implementation of the regional drainage system is necessary because development is occurring in a staged manner.

The primary criteria are flow limits on the drainage channels from one development to another. These function as performance standards that must be met at the fence line of each development. Drainage plans within unconstructed developments have not yet been designed, but each developer is responsible for providing a series of channels and basins within their development so that performance standards at the fence line are satisfied.

In partial implementation of the regional drainage plan, and to address the conditions leading to the federal flood disaster of 1996, the City constructed a bridge on the OR&L right of way to breach the levee created by the OR&L berm. The bridge was designed in compliance with requirements of FEMA, the NFIP Coordinator, the City's Drainage Standards and the Kaloi Gulch Technical Committee's criteria. The bridge is capable of conveying the City's design flow (8,800 cfs at that location) but is presently constrained to the FEMA 100-year flow of 2,500 cfs in accordance with the Technical Committee criteria.

In addition, the Ewa Village golf course was constructed during the Ewa Villages Revitalization Project. The golf course is designed as a flood control facility (detention pond). Between the construction of the OR&L bridge and the Ewa Villages golf course (detention basin), flood hazards in Ewa Villages have been substantially mitigated.

Floodplain mapping in the roadway corridor has not kept pace with development in the area. Mapping has covered the area from Ewa Villages to the shoreline. Flood limits in most of the area above Ewa Villages have not been delineated by FEMA and are there "undetermined". However, because of the 1996 flood event, a FEMA flood plain was defined from the OR&L tracks to Mango Tree Road at the top of Ewa Villages. The limits of the Special Flood Hazard Area shown on Figure 3.B-1 include the historical housing
areas of Varona Village, portions of Tenney and Renton Villages, and the southern tip of the North-South Road Corridor.

In the absence of complete regional mapping, a series of Letters of Map Revisions (LOMR) and Conditional Letters of Map Revision (CLOMR) have been approved by FEMA. The function of these LOMR and CLOMR is to extend flood hazard designations into areas that have not yet been mapped, but where development has occurred or is imminent. Ultimately regional mapping will be extended, and the regional maps will subsume the findings of the LOMRs and CLOMRs.

For example, the City filed a LOMR which was approved by FEMA in 2001 to reflect the construction of the OR&L bridge. The LOMR showed that the entire Kaliol Gulch regulatory flood plain was contained within the Ewa Villages drainage system (the Ewa Villages golf course and ancillary drainage features). The FEMA study limit extended slightly north of Ewa Villages in anticipation of the connection to the proposed East Kapolei Drainage System.

Some developers on the Technical Committee have proceeded to implement portions of the ultimate regional drainage system. These facilities are able to convey the full City design flow, while replacing sufficient storage along the Kaliol Gulch so as not to cause an increase in runoff and sediments from pre-development conditions. For example, the Ewa Villages Golf Course and the Coral Creek golf course combined provide over 160 acre feet of retention and over 400 acre feet of detention. The Ewa Villages and Coral Creek Golf Courses storage basins are located "in-line" with the Kaliol Gulch channel. Their "in-line" configuration allows silt from the upper watershed flows to be filtered and trapped to minimize the amount flowing into the ocean. These two basins would receive the silt-laden water from the upper Kaliol Gulch watershed prior to it crossing Geiger Road. This system allows large quantities of storm water runoff to flow to coastal waters from larger, infrequent storms but the silt-laden water must first flow through two very large settling basins before discharging into the ocean. Ocean Pointe has also planned a golf course to help intercept silt from the storm water runoff prior to its reaching the ocean.

3.8.1.3 WETLANDS

No wetlands were identified in the project area (see Appendix F, North-South Road Corridor Study, Phase I, Botanical Survey Technical Report, November, 1996). The ACOE reported in a letter dated March 21, 1996 that Kaliol Gulch is not considered a wetland. However, as it contains an intermittent stream, the ACOE has jurisdiction over Kaliol Gulch and will regulate the placement of any fill or dredged material.
3.8.2 POTENTIAL IMPACTS

3.8.2.1 GROUNDWATER

As described in Section 3.8.1, the project occurs over the SOBA, an EPA-designated Sole Source Aquifer. In accordance with the 1984 Sole Source Aquifer Memorandum of Understanding between FHWA and EPA, a water quality assessment (Appendix I) was prepared to meet the coordination requirements of Section 1424 (e) of the Safe Drinking Water Act.

Without mitigation, the Build Alternative could result in roadway drainage and inadvertent spills infiltrating the SOBA at the northern portion of North-South Road the H-1 Freeway interchange. The project area traverses the boundary between caprock and basalt approximately 1,000 to 1,500 feet south of North-South Road's intersection with Farrington Highway. Similar potential impacts could also occur under the No-Build Alternative because other existing and future roadways overlie the SOBA, and development projects and roadway improvements are planned in these areas, such as the widening of Farrington Highway and other transportation facilities.

Initially, in a letter dated September 18, 1997, the EPA approved the project under the provisions of the Safe Drinking Water Act, Section 1424(e), concluding the coordination process. The EPA stated that it is unlikely that the project would substantially affect the SOBA Sole Source Aquifer, especially with the proposed drainage system and incident response procedures in place (Appendix I). In a letter dated April 19, 2004, EPA re-approved the project.

3.8.2.2 SURFACE WATER AND FLOODPLAINS

The existing drainage pattern in the corridor, consisting of intermittent streams with insufficient capacity for extreme rainfall events, and overland sheet flow, would need to be modified to accommodate Kapolei’s development as Oahu’s second city. The Kalihi Gulch Technical Committee has developed a plan, emphasizing performance standards that provides for the phased implementation of a regional drainage system consistent with Kapolei’s eventual urbanization.

Chapter 2 describes the drainage facilities included in this project. These drainage facilities are more fully described in Appendix J.

This project will provide a portion of the regional drainage system, with components ultimately sized for the capacity necessary for full build-out of the watershed. There are several scenarios by which this ultimate capacity would be established, discussed more fully in Chapter 2. For example, the regional drainage channel could be excavated with a 10 feet wide bottom initially, and then widened. Or, the ultimate channel, 60 feet wide at the bottom, could be excavated initially, with limiters installed to constrain the flow until additional development occurs and systems downstream are in place to handle larger flows. However, the ultimate configuration of the drainage features would be the same...
regardless of the development scenario that is selected. Additionally, the ultimate environmental impact of the North South Road, Kapolei Parkway, and the associated drainage system would be the same regardless of the development scenario. Therefore, it is the intent of this document to clear through the environmental review process the ultimate configuration of the project's contribution to the regional drainage system, independently of the details of how that ultimate configuration is achieved.

In addition to the regional drainage channel, this project includes other features sized for ultimate regional requirements, such as a basin, culverts, and cross-drains. It is logical for the initial roadway construction to include the ultimate sizing of these features to avoid subsequent roadway disturbance when the capacity of these features would need to be enhanced.

FHWA regulations require an analysis of floodplain impacts in accordance with 23 CFR 650. These requirements include a risk analysis and location hydraulic studies. Elements of the location hydraulic studies are contained in Section 3.8.4 below; the risk analysis will be completed before FHWA renders a FONSI/EIS determination for the separately prepared NEPA EA. Pending this study, the following preliminary information is provided to disclose/discuss the project's floodplain impacts.

The project would not adversely affect any portion of the FEMA floodplain or floodway.

1. The drainage basin just above Ewa Villages will be excavated in the flood plain, but the excavation will increase floodwater storage capacity, a beneficial effect.

2. At the bridge crossings of Kaloi Gulch, the roadway profile will be sufficiently raised to convey the flows within the channel, avoiding an impoundment of floodwaters at the bridge crossings.

3. Because the flood hazard designations mauka of Ewa Villages are largely "undetermined", construction of the roadway berm may involve placement of fill material in the floodplain. However, the concept of a floodplain in an area characterized by sheet flows needs to be considered. As described below, measures will be included so that the berm's impact on sheet flows will not be adverse. Moreover, intercepting sheet flows is a beneficial impact necessary for the planned urbanization of the area.

North-South Road would alter the local drainage pattern by interrupting sheet flow between Farrington Highway and Ewa Villages. The roadway would be placed on a berm, and act as an impediment to sheet flows. However, channelized flows within Kaloi Gulch would flow under the road because North South Road would include two bridge crossings of Kaloi Gulch.

Sheet flow that would collect along the west side of the roadway berm would be captured by an interceptor ditch on the western base of the berm. Large roadway cross-drains would then carry flows beneath the roadway embankment to the primary drainage channel on the east side of the roadway.
North-South Road would pass over Kalo I Gulch in two places (Figure 3.8-1). The Kalo I Gulch crossings would be bridges allowing flow in Kalo I Gulch to pass under the roadway. Because the roadway profile would preclude a complete bridging of Kalo I Gulch, an ACOE permit will be required to alter the upper portion of the stream banks to support the bridge. The affected bank portions would be above the normal flow level.

At the upper crossing of Kalo I Gulch, North South Road would be higher than the banks of the Gulch so the water exceeding the 800 cfs capacity of the Gulch would remain on the east side of the road. This overflow, together with other runoff on the east side of the embankment, would enter the proposed flood control drainage channel that would be constructed with the project. The drainage channel would have sufficient capacity to contain the FEMA 100-year flood flow and convey it to the existing Ewa Villages flood control facility (Ewa Villages golf course).

The Kalo I Gulch channel crosses North-South Road a second time just upstream of Ewa Villages. Flows that occur within and along the east side of channel would pass beneath the roadway through a 40-foot wide bridge and enter the Ewa Villages flood control facility (Ewa Villages golf course).

An area north of Ewa Villages (Figure 3.8-1) would be excavated to create a detention basin. This basin would function as a storm water storage area for increased runoff caused by the impervious surfaces associated with North-South Road. This basin would mitigate the loss of beneficial floodplain values, such as storm water retention, settling of the sediment load, and groundwater recharge, that would be adversely affected by the roadway construction.

Overflows from this new detention basin would discharge into the Ewa Villages Golf Course along the Kalo I Gulch channel. The existing box culvert into the Ewa Villages golf course will be increased (as part of this project) to pass 2,500 cfs, in accordance with Kalo I Gulch Technical Committee criteria.

The added flood control capacity provided by the new drainage channel and storage basin has sufficient volume to contain the FEMA 100-year flow, including the sheet flows that would be collected by the interceptor ditch and drainage channel along the North South Road roadway berm. In the interim phase, the drainage channel would be capable of conveying 7,400 cfs when the water level reaches the top of the channel bank (no freeboard). This is three times the FEMA 100-year flow of 2,500 cfs. This allows the interim phase of the channel to conform to City Drainage Standards.

As discussed in Chapter 2, there are several ways to provide this interim capacity, such as reducing the initial excavation of the channel, or excavating the ultimate channel dimensions and installing limiters to restrict the flow to the initial allowable conveyance rate.

As abutting developments progress, additional runoff would be generated through the creation of additional impervious surface. These abutting developments will need to meet the fence line discharge performance standards of the regional drainage plan.
Enforcement of these standards will occur through the City's review of drainage studies or master plans as part of zoning review.

Developers will need to consider whether they prefer to discharge to the North South Road drainage channel; discharge to Kaloli Gulch; construct a new drainage channel discharging to the Ewa Villages Golf Course; or make other arrangements. The allowable flow along the Kaloli Gulch channel into Ewa Villages would increase to 5,000 cfs. When all downstream flood control measures are in place, the full design flow would range from 6,000 cfs at the Farrington Highway, to 7,400 cfs at the top of Ewa Villages, to over 11,500 cfs at the ocean.

Should these developers propose to discharge to the North South Road drainage channel, the capacity of the channel will need to be increased over time to allow sufficient freeboard when flows reach 7,400 cfs, which corresponds to full build out in the watershed. (The channel to be constructed in the interim phase will convey 7,400 cfs with no freeboard. As development occurs, it will be desirable to provide for freeboard when flows of 7,400 cfs are conveyed).

There are options for increasing the capacity of the drainage channel, including channel widening through excavation, or moving limiters installed initially within the ultimate channel.

The natural and beneficial floodplain values of storm water retention, sediment settling, and groundwater recharge would be enhanced by the new detention basin and by the grass-lined drainage channel.

Negative impacts on regional drainage would not be substantial, either because the actions are in support of and instrumental to the planned regional development for the area, or because the impacts would be addressed by features included in this or other project descriptions.

Efforts to modify the sheet flow patterns of the Ewa Plain would continue regardless of the status of North South Road and Kapolei Parkway. All of the housing areas can be accessed without North-South Road and Kapolei Parkway. Flood risk for developments along Kapolei Parkway will be mitigated by the detention capacity of the Ewa Villages Golf Course. Development that will occur along the North-South Road will collect storm runoff and direct it into the flood control drainage channel along North-South Road for conveyance to the Ewa Villages Golf Course.

Landowner members of the Kaloli Gulch Technical Committee continue to develop their portion of the ultimate regional drainage plan, which includes storm water retention areas, such as golf courses, at various locations. Projects in the area are in various stages of planning, design, and construction so interim solutions must be implemented along with the ultimate solutions until all of the ultimate drainage improvements are constructed. The Kaloli Gulch Technical Committee's drainage plan facilitates the City's approval of ongoing improvements and mitigation of the impact of upstream developments and the greater conveyance of surface runoff to low-lying areas.
Apart from this North South Road and Kapolei Parkway project, Kaloi Gulch would be realigned into golf courses and other drainage control features from Ewa Villages to the ocean. Because a future regional drainage project may require the flow from the nearby Hunehune Gulch to be re-directed to the re-aligned Kaloi Gulch, project engineering for North-South Road has considered this possibility and would not preclude future options for such potential regional drainage improvements. However, modifications of Hunehune Gulch are not part of this project.

3.8.2.3 WETLANDS

Although Kaloi Gulch may be the expected area to find wetlands, as described in Section 3.8.1.3, no wetlands were identified in the project area. The Kapolei Parkway portion of the proposed project would not affect the Kaloi Gulch crossing because a bridge already exists in this segment, and no new bridges would be required. Therefore, no wetlands impacts would occur for either the No-Build or Build Alternatives.

3.8.3 MITIGATION MEASURES

3.8.3.1 GROUNDWATER

The storm water system proposed for the northern section of North-South Road and its interchange with the H-1 Freeway will collect and convey roadway drainage and inadvertent spills along the roadway to a discharge point approximately 1,500 feet south of Farrington Highway. The discharge point will be south of the caprock boundary, and therefore would be located above caprock. In addition, hazardous spills will require immediate containment and clean up as required by State regulations. With the proposed drainage system and these incident response procedures in place, potential infiltration impacts of the new roadway on the SOBA would be minimal. EPA has concurred with the planned mitigation measures.

3.8.3.2 SURFACE WATER AND FLOODPLAINS

North-South Road would affect existing sheet flow patterns and generate increased runoff through the creation of new impervious surfaces. The project includes features to capture, detain and convey the intercepted sheet flows safely, and in a manner consistent with the Kaloi Gulch Technical Task Force regional drainage plan. New volumetric storage capacity is being provided to store the increased amount of runoff created by Impervious surface. The interim drainage concept for North South Road allows for future modifications of the roadway drainage system by others as the volume of storm water discharges from abutting developments increase. The Kaloi Gulch Technical Task Force plan allocates responsibility for enlargement of the North South Road drainage features to abutting developers. Abutting developers would cause the need for enlargement of the North South Road drainage system.
Because the project's impacts on surface waters, floodplains and hydrology would not be substantial, because of features included in the project definition, and because the project's modifications to drainage coordinate with master plans for the area, no additional mitigation is necessary beyond elements already included in the project definition.

An ACQE 404 permit and a HDOH Water Quality Certification will be required for the two Kaloi Gulch crossings. These permits would contain specific mitigation measures for the stream crossings.

The proposed drainage system for the North-South Road and flood hazard district certifications will be submitted to the City during the design phase to certify that the project is in compliance with the City's requirements as a participant in the NFIP.

3.8.3.3 WETLANDS

No mitigation measures are necessary because no wetland impacts are anticipated.

3.8.4 FINDINGS OF LOCATION HYDRAULIC STUDIES

FHWA requires certain findings pursuant to 23 CFR 650, Subpart A. These findings are summarized in Section 650.11, Subpart C. These points are as follow:

1) The risks associated with the implementation of the action.

The North-South Road would extend down gradient from the H-1 Freeway to the Kapolei Parkway. The flood plain in this area is generally characterized as shallow flooding with sheet flows of less than one foot in depth. There is a FEMA floodplain defined to approximately 300 feet above Ewa Villages with no floodway. The remainder of the area to the H-1 Freeway is undefined by FEMA because, currently, the flood risk is low because there are presently no structures in this area.

The East Kapolei EIS described the regional improvements required to control flooding in the area based on the requirements of the City's Flood Ordinance which meets the requirements of the National Flood Insurance Program, as reviewed by the State NFIP Coordinator, the City's Drainage Standards and the Kaloi Gulch Technical Committee's criteria. The East Kapolei Drainage Master Plan included a drainage channel along the North-South Road with storage basins intermittently spaced to control the increase in runoff due to the proposed development. One basin was located immediately above the Ewa Villages Golf Course. The proposed action would implement the drainage channel and the storage basin above the Ewa Villages Golf Course described in the East Kapolei Drainage Master Plan.

The proposed action would reduce floodplain risk. The proposed drainage channel, even in its interim configuration, would have the capacity to convey the
FEMA 100-year flow with adequate freeboard to convey two to three times that flow within its banks. The flood risk would also be improved through the increase of floodwater storage capacity, by the construction of the detention basin. Also, the conveyance capacity of Kaloi Gulch would be maintained, because North-South Road would be placed on bridge crossings, allowing current flows to be maintained. Additionally, the drainage channel would be able to collect floodwater that presently sheet-flows across the plain.

When the ultimate capacity of the drainage channel is established, flood risk would decline further.

2) The impacts on natural and beneficial floodplain values.
Proceeding with the proposed project would enhance the floodplain values of natural moderation of floods through a new floodwater storage basin that would promote groundwater recharge and reduce the volume of silt, which would improve the water quality of the receiving waters.

The storm runoff that does not sheet flow across the floodplain would flow in a new grass lined channel along the roadway that would convey the storm runoff to the new storage basin that would be constructed immediately above the Ewa Villages Golf Course. This grass-lined channel would work with the basin to moderate the floodwaters, improve water quality and foster groundwater recharge prior to discharging into the Ewa Villages Golf Course.

3) The support of probable incompatible floodplain development.
Government plans specifically direct development to the Kapolei Area. The current existing drainage conditions need to be modified to accommodate this growth. An interim and long-term plan to modify regional drainage has been developed by the Kaloi Gulch Technical Committee. Implementing this proposed project is consistent with the Technical Committee’s plan. Therefore, this project supports the modifications of regional drainage that are necessary for urban development.

4) The measures to minimize floodplain impacts associated with the action.
Under proposed conditions, several improvements are being implemented to mitigate the encroachment effects of the North-South Road project. These improvements include:

   a. Installation of a new grass lined channel with a capacity of 2,500 cfs along the east side of North-South Road. The channel would serve to capture overflow from the upper Kaloi Gulch crossing with North-South Road. It would also serve to collect runoff from the roadway and from areas west of the roadway.

   b. Installation of a new storage basin at the downstream end of the new drainage channel, just upstream of the Kaloi Gulch inlet to Ewa Villages. The storage basin will be grass lined and would serve to contain runoff volume increases resulting from the
impervious surfaces of the roadway, moderate flood flows, promote groundwater recharge and improve water quality.

c. Installation of additional culverts at the Kaloi Gulch inlet to Ewa Villages to pass 2,500 cfs. The added culverts would serve to increase the capacity of the existing 20 feet by 8 feet box culvert from approximately 800 cfs to 2,500 cfs.

d. Installation of two bridges to allow the storm runoff that is contained within the Kaloi Gulch channel to flow unimpeded under the roadway.

e. Installation of cross drains to allow runoff from the west side of the North-South Road to flow into the drainage channel.

5) The measures to restore and preserve the natural and beneficial floodplain values impacted by the action.

The proposed storage basin would naturally retain and detain storm runoff to moderate flooding. The basin will be grassed to naturally maintain groundwater quality through filtration and sedimentation and facilitate groundwater recharge. The basin would provide a landscaped open space to the floodplain. The grass-lined channel would also provide landscaping and open space values to the floodplain along with natural filtration of the storm water and groundwater recharge as it conveys the floodwaters to the basin. The new channel and basin would increase the conveyance to existing flood control features such as Ewa Villages Golf Course, the OR&L Bridge, the Coral Creek Golf Course and one day the Ocean Pointe Golf Course on its way to the ocean. The roadway’s drainage features will be integrated with abutting roadway features, so a system-wide approach to the preservation of the natural and beneficial floodplain values will be implemented.

Another component of the Location Hydraulic Studies required by 23 CFR 650.11 is an alternatives analysis. The following is a discussion of the roadway alternatives that were considered. Further detail of this alternatives analysis will be included in the risk analysis currently being prepared.

The North-South Road is aligned generally longitudinal to the existing Kaloi Gulch channel between the H-1 Freeway and Ewa Villages. This configuration constitutes a longitudinal encroachment of the Kaloi Gulch flood plain.

Longitudinal encroachment alternatives that were considered include the following:

- Use of a transverse (east-west) roadway alignment
- Use of an at-grade roadway that matches the existing grade of the flood plain
- Use of structural supports to elevate the roadway above the flood plain
- Use of fill and bridge crossings to elevate the roadway above the flood plain combined with drainage mitigation measures
Transverse Alignment
Transverse alignment alternatives, such as east-west alignments, would result in a long roadway and would not result in a direct connectivity between the lower Ewa plain area and the H-1 Freeway. The cost would be higher than a north-south road and with less functionality.

At-Grade Roadway
A roadway placed at-grade would be subjected to flooding. Since this project is considered a major urban arterial roadway, placing the roadway at-grade would not fulfill the transportation reliability needs of such a facility, especially during emergency situations. The low roadway profile would also add capacity constraints to the Kaloi Gulch channel at the two locations where the roadway crosses the channel. The cost of an at-grade roadway would not be significantly lower than an elevated roadway on fill.

Elevated Roadway using Structural Supports combined with Drainage Mitigation Measures
A bridge structure would be required to elevate the roadway above the existing flood plain. This alternative has some impact on the flood plain conveyance due to the many pier supports that would be required. A parallel drainage channel system would still be needed to counter the effects of loss conveyance. The cost of the elevated roadway using structural supports would be significantly higher than an at-grade roadway or an elevated roadway on fill, and access to this highway alternative would be more difficult and inefficient than with an at-grade roadway or an elevated roadway on fill, described below.

Elevated Roadway using Fill and Bridge Crossings combined with Drainage Mitigation Measures
Bridge structures over Kaloi Gulch in combination with fill would enable the roadway to be elevated above the existing flood plain. As in the previous alternative, this alternative will also require a parallel drainage channel system to counter the effects of loss conveyance.

The "Elevated Roadway using Fill and Bridge crossings combined with Drainage Mitigation Measures" was selected as the most practical and cost-effective alternative.

3.9 HAZARDOUS MATERIALS

3.9.1 EXISTING CONDITIONS
A Hazardous Materials Technical Report, included as Appendix K, was completed in 1997 to investigate the potential occurrence of hazardous materials along the proposed North-South Road alignment. The area studied for the assessment encompassed the proposed alignment and adjacent areas. Records at the State of Hawaii Department of...
Health (HDOH) have since been reviewed to update the findings of the 1997 report and to evaluate the portion of Kapolei Parkway between Renton Road and North-South Road.

The 1997 database search included federal and state environmental databases, in accordance with the American Society for Testing and Materials (ASTM) standards for environmental site assessments (E1527-93). The sites identified from the database search were examined during a site reconnaissance and a review of files at the HDOH to identify and confirm the reported location, to assess the general "housekeeping" at the site, and to identify additional environmental concerns. In addition, the project area was surveyed to identify potential contaminant sites that were not listed in the databases, but presented a potential environmental concern based on observations during the site reconnaissance.

Data from the HDOH were obtained for sites identified in the databases. Data at HDOH generally consist of tank registration documents, documented environmental violations, general extent of contamination at the site, types of contaminants identified, contaminant concentrations detected, and status of remedial actions. Groundwater flow direction and depths were also obtained from HDOH files to further assess the migration potential of contaminants along the alignment.

The intent of the assessment was to identify reported and obvious potential hazardous material conditions that would need to be addressed by the project. A definitive determination of the actual presence or absence of contamination has not been made. The assessment was not performed to meet "innocent landowner" provisions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that establish a defense for the purchase of real property. This assessment does not guarantee, imply, or appear that all potential contaminant sources have been located, due to the possible presence of an unlisted contaminant occurrence. The presence of asbestos-containing material, lead-based paint, and radon was not determined as part of this assessment.

The search of federal and state environmental databases identified an entry on the CERCLA list. The entry was the Ewa Sugar Mill/Oahu Sugar Company which consists of several sites. One of the sites, the pesticide mixing, storage, and loading area, is located approximately 1,000 feet to the east of the proposed North-South Road alignment in an abandoned sugarcane field (Figure 3.8.1). A second site, consisting of the sugar mill buildings, is located on Renton Road near its proposed intersection with Kapolei Parkway. It is approximately 20 acres. The other site is a coral pit located 1.8 miles south of the sugar mill.

No additional sites were identified from historical maps, aerial photography, and site reconnaissance.

3.9.2 POTENTIAL IMPACTS

Two potentially contaminated sites associated with the Ewa Sugar Mill/Oahu Sugar Company were identified near the North-South Road/Kapolei Parkway Corridor. The
pesticide mixing, storage and loading area is located approximately 1,000 feet from the proposed North-South Road alignment. Soil in the pesticide mixing, storage and loading area is contaminated with dioxins, furans, herbicides and pesticides used by Oahu Sugar Company. Wells in the caprock aquifer in the pesticide mixing, storage and loading area have shown traces of pesticides such as atrazine.

The soils in the roadway ROW are not expected to be contaminated by groundwater containing pesticide residues because the groundwater gradient is south southeast toward the coastline. In addition, the excavation required to build the road would not be deep enough to encounter groundwater.

Although the mill property is near the proposed section of Kapolei Parkway, the main mill operations were located along Renton Road at least 1,000 feet from the alignment. Hydrocarbons, volatile organic compounds, heavy metals, pesticides, and polychlorinated biphenyls (PCBs) have been identified near Renton Road. Samples were not collected adjacent to Kapolei Parkway. Although the groundwater gradient could flow toward Kapolei Parkway, downgradient wells on the Ewa Sugar Mill/Oahu Sugar Company site did not indicate groundwater contamination near the Kapolei alignment (Environet, Inc., 2002).

The coral pit is located too far from the project to be of concern.

Although the sites identified are highly unlikely to affect the project, the contractor will be required to train their workers to be diligent in observing any potential indicators of hazardous materials in the construction area. In addition, illegal dumping, abandoned barrels, and other forms of waste not easily discerned through record searches and published reports should be cautiously approached.

3.9.3 MITIGATION MEASURES

No hazardous materials impacts are expected. However, workers will be aware of illegal dumping, odors, discoloration, and other indications of possible contamination.

3.10 HISTORIC RESOURCES

3.10.1 REGULATORY REQUIREMENTS

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies consider the effect of their projects on any resource listed on or eligible for the National Register of Historic Places (NRHP). The Section 106 process involves coordination and consultation with the State Historic Preservation Officer (SHPO), and other agencies and organizations that have an interest in or are mandated to protect historic properties. In addition, the Advisory Council on Historic Preservation (ACHP) is afforded the opportunity to comment on actions that may potentially affect historic properties. The requirements of Section 6E-8 of the Hawaii Revised Statutes (HRS) place similar responsibilities on State agencies to evaluate their projects. Since the
project involves both federal and State agencies, both regulations apply to the project. Completion of the Section 106 process would normally satisfy the requirements of HRS Section 8E-8.

In accordance with regulations provided in 36 Code of Federal Regulations (CFR) 800, the federal sponsoring or regulating agency after initiating the Section 106 process, has the responsibility of conducting a good faith effort to identify whether there are any historic properties in the project’s Area of Potential Effect (APE). If a historic property(ies) were identified within the APE, the federal agency would then assess whether it would be adversely affected by the proposed project. If the effect were "adverse", such an effect is resolved through a Memorandum of Agreement with the SHPO, which may include the ACHP. The HRS Section 8E-8 process, as described in regulations provided in Title 13, Chapter 275 of the Hawaii Administrative Rules, is similar to the Section 106 process.

3.10.2 EXISTING CONDITIONS

This section describes the actions taken to identify historic properties in the project's APE. A historic property is any district, site, building, structure, or object that is on or eligible for the NRHP. The APE is defined as the geographic areas within which an undertaking may directly or indirectly cause changes in the character of historic properties, if any such properties exist. For this project, FHWA has defined the APE as the area affected by construction, which includes:

- North-South Road, including an interchange with the H-1 Freeway;
- Kapolei Parkway from its intersection with North-South Road to its intersection with Renton Road; and
- Additional ROW needed for a drainage channel along North-South Road and a flood detention basin.

As part of the earlier environmental review process conducted for the North-South Road project, an archaeological reconnaissance survey was conducted along the North-South Road corridor (see Appendix V and Figure 3.10-1). No archaeological sites, such as prehistoric or early historic Hawaiian sites, were identified in the survey mainly because the corridor is within an area that was used for commercial sugarcane cultivation between the late 19th century and the early 1990s. Remnants of plantation infrastructure were observed during the survey, such as flumes, ditches, and roadways. These sites are not considered of historic value and would not be eligible for the NRHP.

An earlier archaeological assessment for the East Kapolei Development project, which encompassed the area surrounding the North-South Road corridor also concluded that the area is highly unlikely to contain archaeological sites because of past commercial sugarcane cultivation (November 6, 1996).

There are two well-known historic properties in the general vicinity of the segment of Kapolei Parkway, from the proposed North-South Road to Renton Road: Ewa Sugar Plantation Villages (Ewa Villages) Historic District (State Site 50-80-12-9798), and the
OR&L ROW (State Site 50-80-12-9714) (see Figure 3.10-1). FHWA has determined that a portion of the Ewa Villages Historic District is within the project’s APE, but that the OR&L ROW is not within the APE (see Figure 3.10-1).

The City and County of Honolulu implemented a project to redevelop Ewa Villages, which included rehabilitation of certain houses, construction of new residences, and providing for parks, and roadway and other infrastructure, included establishing a portion of Ewa Villages as a historic district. The Ewa Villages Historic District was placed on the Hawaii Register of Historic Places (HRHP) in 1996, and was nominated to the NRHP in 1995. Ewa Villages is the oldest existing community in the Ewa region. Built around the Ewa Sugar Mill in the 1850s, the villages grew around the mill site over the next 60 years. At one time there were as many as eight “villages” housing immigrant plantation workers. Presently, only Renton, Tenney, Fernandez, and Varona Villages remain. These villages and other associated historic plantation structures, such as the Ewa Community Church, Ewa Hongwanji Mission, and the Ewa “J” Club, constitute this historic district.

The OR&L ROW, which is listed in the NRHP, is 13 miles long and has a width of 40 feet, running between Honolulu to the east and Nanakuli to the west. The OR&L ROW contains narrow-gauge steel rails (36 inches) on a raised roadbed of mixed materials. The historical significance of the OR&L ROW is that it is a well preserved remnant of the 175 miles of track laid by this company that had a tremendous effect on the economic development of Oahu and the State of Hawaii in the early and mid 1900’s. Another type of potential historic property is traditional cultural properties. A major traditional cultural property in the region may have been those associated with the gathering of native plant resources. However, such gathering activities currently do not appear to occur within the project area. See Section 3.4 for a discussion of this and other potential contemporary cultural activities.

3.10.3 POTENTIAL IMPACTS

Under NHPA Section 106, the federal agency – in this case, FHWA – is responsible for assessing the effects of the project (i.e., Build Alternative) on all historic properties within the APE. Pursuant to Section 106, FHWA can render one of the following three possible findings:

- no historic properties affected;
- no adverse effect; and
- adverse effect.

"No historic properties affected" means that either there are no historic properties present, or there are historic properties present but the undertaking would have no effect upon them of any kind (that is, neither harmful nor beneficial).

"No adverse effect" means that there could be an effect, but the effect would not be harmful to those characteristics that qualify the property for inclusion in the National Register.
An "adverse effect" means an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property.

As described in Section 2.2, the No-Build Alternative assumes that the portion of Kapolei Parkway between Renton Road and North-South Road would be constructed. As a City project under the No-Build Alternative, construction of Kapolei Parkway would be subject only to HRS Section 6E-8 review by the State Historic Preservation Division (SHPD). However, under the Build Alternative, construction of Kapolei Parkway would be "federalized", expediting its completion. Therefore, the HRS Section 6E-8 and NHPA review of this project includes the City's portion of Kapolei Parkway.

As described above, the project area was used for commercial sugarcane cultivation for many decades throughout the 20th Century. Sugarcane cultivation requires extensive grading and burning of crops, which would have destroyed any historic sites that may have been present. SHPD staff determined that the entire project area would be within former sugarcane land, and therefore, they would agree with a "no historic properties affected" determination with regards to archaeology (e-mail correspondence dated March 11, 2004).

Under all the alternatives, the portion of Kapolei Parkway from Renton Road and North-South Road would be constructed, and its intersection with Renton Road would be within the Ewa Villages Historic District, although most of the road would be outside of the district. The alignment of Kapolei Parkway was master planned as part of the City's effort to establish Ewa Villages as a historic district, and therefore, the roadway does not require the displacement of any structure within the district. The Kapolei Parkway/Renton Road intersection would be located in a relatively isolated area of the historic district, and not within the district proper, which contains many of the contributing or individually historic structures of the district.

The appearance of the proposed Kapolei Parkway will be designed to be continuous with the makai portion of Kapolei Parkway in the Ewa by Gentry neighborhood in order to provide a consistent look to the roadway. By the time the mauka portion of Kapolei Parkway is constructed, which is part of the proposed action, its intersection with Renton would already include an upgrade to the existing unimproved Renton Road.

Construction of the makai portion of Kapolei Parkway will include extending the curbs, gutters and sidewalks that currently end at the Kalo Gulch bridge. The appearance of the parkway will also be similar to Renton Road, which is within the historic district and was developed to be consistent with the district's historical integrity. The proposed portion of Kapolei Parkway will include a landscaped median with enough room for large shade trees, and landscaped sidewalks. The Kapolei Parkway/Renton Road intersection will likely warrant traffic signals regardless of the alternative selected (see Sections 2.1 and 2.2).

In addition to consulting with SHPD staff, FHWA invited the following organizations by mail to participate in consultation regarding the above effect determinations:

- Office of Hawaiian Affairs (OHA)
North-South Road and Kapolei Parkway

Final Environmental Assessment

- Historic Hawaii Foundation
- Hui Malama I Na Kupuna O Hawaii Nei
- Oahu Island Burial Council (OIBC)
- Hawaiian Railway Society

In addition, other community organizations and individuals were also asked to participate in consultation (see Appendix A). Consultation letters were sent on May 7, 2004. Consultation with OIBC was intended to include an appearance at its June 9, 2004 meeting. However, OIBC was unable to have a quorum for this meeting, and the consultation was moved to July 14, 2004. No comments regarding historic properties or issues in the APE were received from the consulting parties.

Based on the information described above and in accordance with NHPA Section 106, FHWA rendered a "no historic properties affected" determination with regards to archaeology. With regards to the Ewa Villages Historic District, FHWA rendered a "no adverse effect" determination on August 20, 2004 (see Appendix A). In a letter dated September 8, 2004, the SHPO concurred with these effect determinations, thus completing the NHPA Section 106 process. In its letter, SHPO agreed that given the modern alterations to the portion of Renton Road crossed by the proposed project, the property affected is not a contributing property to the historic district, and that the project would have "no adverse effect" on the historic district as a whole or on its integrity. However, the SHPO requested that Renton Road remain "a framed view corridor" linking the distinct plantation villages within the historic district.

3.10.4 MITIGATION MEASURES

The City Department of Design and Construction (DDC) will be responsible for constructing the Kapolei Parkway/Renton Road intersection as part of a separate project. Despite the "no adverse effect" determination on the portion of Kapolei Parkway between Renton Road and North-South Road, DDC will include SHPD comments as input into the design of the traffic signal hardware. DDC will also discuss with SHPD potential treatments to maintain the visual continuity on Renton Road through this intersection. This mitigation measure applies to both the No Build and Build Alternatives because the traffic signals are anticipated to be warranted under both alternatives.

3.11 PARKS AND RECREATION

3.11.1 EXISTING CONDITIONS

The Ewa Plain contains a number of beach parks, golf courses and neighborhood or community parks and (see Figure 3.11-1).

Beach parks near the project area include Ewa Beach Park and Oneula Beach Park in Ewa Beach and Nimitz Beach Park in the former Barbers Point Naval Air Station.
Municipal, private and military golf courses located next to the proposed project include the following (see Figure 3.11-1):

- Ewa Villages (municipal)
- West Loch (municipal)
- Kapolei (private)
- Coral Creek (private)
- Barbers Point (military)

There are no parks at or next to the proposed North-South Road and Kapolei Parkway from North-South Road to Renton Road (see Figure 3.11-1). However, Ewa Mahiko District Park is adjacent to the future segment of Kapolei Parkway between Renton Road and the OR&L ROW, and Geiger Park is adjacent to Kapolei Parkway in Ewa by Gentry (see Figure 3.11-1). Both parks are frequented primarily by residents of the surrounding Ewa by Gentry and Ewa Villages community.

Ewa Mahiko District Park is triangularly-shaped, bordered by Kapolei Parkway, Renton Road, and Park Row. The latter is a future roadway extension from Renton Road to Kapolei Parkway near the OR&L ROW. The park currently features large grassy fields, which include baseball/softball fields, a new comfort station, and parking off of Renton Road. The northwest corner of the park, adjacent to the future Kapolei Parkway and Renton Road intersection is designated for flood control since it is immediately downstream from a bridge on Renton Road (technically called “North-South Road Bridge” by the City and County) over Kalei Gulch. Future plans for this park include a gymnasmum; basketball, tennis, and volleyball courts; a swimming pool; and additional parking off of the future Park Row. A few buildings in association with the historic Ewa Mill site that are on park property may be re-developed for community and recreational purposes, but there are no confirmed development plans. Geiger Park is located at the corner of Kapolei Parkway and Geiger Road. It features a baseball diamond with backstop, a large grassy field, playground equipment, and comfort station.

Other notable parks in the general vicinity of the project include Ewa Mahiko Park (not to be confused with Ewa Mahiko District Park) located just east of Ewa Mill, Asing Park located on the east side of Fort Weaver Road near Renton Road, and West Loch Shoreline Park (see Figure 3.11-1). Access to Ewa Mahiko Park is off of Renton Road, and the park features basketball courts, a baseball/softball field, and a comfort station. Asing Park, a municipal facility, provides baseball/softball fields, basketball courts, and a community center. West Loch Shoreline Park’s major feature is its pedestrian/bike path that is also accessible from Asing Park.

The Hawaiian Railway Society currently oversees railroad operations as a tourist attraction on the OR&L ROW. Its main facility (railroad baseyard and museum) is located south of Varona Village across Renton Road, and its train runs between the museum and Kahe Point at the end of the Wai'anae Coast. According to its letter dated March 6, 1999 (see Appendix A), Hawaiian Railway Society plans to initiate railroad operations on the portion of the ROW east of the museum. In addition, HDOT is planning
to develop a bike path within the ROW from West Loch Shoreline Park to Kahe Point (see Section 3.3.1.3).

A neighborhood park is planned between Kapolei Parkway and Varona Village on the north side of Renton Road.

### 3.11.2 POTENTIAL IMPACTS

As described in Section 2.2, the No-Build Alternative assumes that Kapolei Parkway from Renton Road to North-South Road would be constructed, but at a later date than under the Build Alternative. Therefore, under the No-Build Alternative, Kapolei Parkway would be developed, but because its alignment was master planned during the Ewa Villages re-development project by the City and County of Honolulu, it would not require ROW from any existing park or recreational facility, such as Ewa Mahiko District Park. It would also not adversely affect development of any future park or recreational facility, such as the planned park next to Varona Village, and the OR&L bike path. Development of Kapolei Parkway would facilitate public access to parks and recreational facilities by improving regional mobility in Ewa.

Under the Build Alternative, development of North-South Road would also not require ROW from any existing park or recreational facility. In addition, the project would not affect development of any planned park or recreational facility. The addition of North-South Road to the roadway network would facilitate public access to parks and recreational facilities to a greater extent than under the No-Build Alternative by providing access to the H-1 Freeway.

### 3.11.3 MITIGATION MEASURES

Mitigation is not necessary because no adverse impacts to parks and recreational resources are anticipated.

### 3.12 SECTION 4(F)

Section 4(f) of the Department of Transportation Act, 49 U.S.C. 303 and 23 U.S.C. 138 (hereafter, "Section 4(f)"), permits transportation projects to use land from a significant publicly-owned public park, recreation area, wildlife and waterfowl refuge, or a historic site only when FHWA has determined that:

- There is no feasible and prudent alternative to use of that land; and
- The project includes all possible planning to minimize harm to the property resulting from such use.

The purpose of Section 4(f) is to preserve significant parkland, recreation areas, refuges, and historic/archaeological sites by limiting the circumstances under which such land can be used for transportation projects. The word "use" in this case means:
• Land is permanently incorporated into a transportation facility;
• There is a temporary occupancy of land that is adverse in terms of preservation of the resource; or
• The project's proximity to the site substantially impairs those functions that qualify the site as a Section 4(f) resource even though no land is permanently or temporarily acquired. This type of use is called "constructive use."

The proposed project would not require a Section 4(f) "use" for the following reasons:

The proposed project would not use lands from publicly-owned public parks or recreational facilities, or wildlife and waterfowl refuges because no such resources exist within the ROW needed for the project.

Although a portion of the proposed project would intersect Renton Road within the Ewa Villages Historic District, which is eligible for the NRHP (see Section 3.10), FHWA has determined that a Section 4(f) use would not occur, based on guidelines provided in FHWA's "Section 4(f) Policy Paper" (September 24, 1987, Revised June 7, 1989), because the property affected is not an integral part of the historic district, and the affected property is not a contributor to the historic character of the district. Renton Road has been modernized and has been re-constructed based on current standards; similarly, the Registration Form submitted by SHPD to the National Parks Service in order to nominate the Ewa Villages Historic District for the National Register has omitted Renton Road as one of the 17 specified contributing sites. As noted in Section 3.10, FHWA rendered a "no adverse effect" determination regarding the potential impact of this project on the historic district, pursuant to NHPA Section 106. In a letter dated September 8, 2004, the SHPO agreed that the affected area of the district does not contribute to the historic characteristics of the district.

Similarly, a "constructive use" would also not occur, because the proposed action would not impair the functions of those historic elements within the district that contribute to the district's historic characteristics, as stated in FHWA's Section 106 effect determination letter to SHPD, and as noted in the concurrence received from SHPO (see Section 3.10 and Appendix A). Copies of coordination letters exchanged with the SHPD and SHPO are in Appendix A.

3.13 VISUAL AND AESTHETIC RESOURCES

3.13.1 EXISTING CONDITIONS

Existing visual resources encompass a variety of physical features including landforms, scenic vistas, historic monuments, and vegetative communities. Adopted preservation policies signify the value of visual resources within a given community or local area. Policy documents and land use ordinances often identify sensitive visual resources within an area and develop policies for their preservation.

The project site is located in the Ewa Plain on the leeward side of Oahu. As described in Sections 3.1 and 3.2, the Ewa Plain was once used for sugarcane cultivation. It is now...
undergoing substantial urbanization, but there are still areas used for agriculture. The undeveloped lands are characterized as fallow agricultural fields, supporting weedy plants, koa haole scrub, and mixed scrub.

The topography of the Ewa Plain, as described in Section 3.2, is relatively flat from the shoreline to the H-1 Freeway where the grade increases to the Central Oahu plateau. The southern slopes of the Waianae Mountain Range and Kualoa Barbers Point define the northwest and western boundaries of Ewa, respectively.

The Ewa Development Plan (Ewa DP; see Section 3.1.2.2b) identified the following visual landmarks and vistas that are to be preserved and enhanced:

- Shoreline and ocean;
- Waianae Mountain Range;
- Na puu at Kapolei;
- Makai views from Makakilo; and
- Views of Central Honolulu and Diamond Head.

The Ewa DP also identified the historic OR&L ROW and the Ewa Villages Historic District (see Section 3.10) as important visual resources.

### 3.13.2 POTENTIAL IMPACTS

#### 3.13.2.1 METHODOLOGY

The analysis of visual impacts considers the following concepts and factors:

- Viewshed;
- Viewer groups;
- Landscape units; and
- Key views.

**Viewshed.** The viewshed is the surface area that is visible from a variety of viewpoints. The viewshed can be affected by topography, vegetation, and the built environment. The viewshed for the proposed project is shown in Figure 3.13-1.

**Viewer Groups.** A viewer group is a group of persons who, based on their location, activity, and length of exposure to a view, might be affected by the introduction of the project into the viewshed. The viewer groups identified for this analysis include residents, motorists, and those using recreational resources near the project.

**Landscape Unit.** A landscape unit is a subdivision of the viewshed's landscape setting. Each landscape unit is relatively homogeneous in physical and visual characteristics. Landscape units are used to evaluate physical changes within the viewshed and related visual impacts. The following landscape units were identified for the analysis and include the visual landmarks and vistas identified in the Ewa DP.
Mauka landscape unit, which includes the Waianae Mountain Range and Central Oahu plateau;
• Makai landscape unit, which includes Kapolei and Ewa Village Golf Courses and the undeveloped area of the Ewa Plain; and
• Historic District landscape unit, which includes the Varona and Tenney Villages, and the Ewa Villages Historic District as a whole.

Key Views. Key views represent the range of visual resources within the study area, the landscape units, and the viewer groups. The key views identified for analysis are shown in Figure 3.13-2. The figure shows the location and direction of view for each key view. The key views include:

• Viewpoint 1: Upper part of Makakilo on the eastern side of the south ridge, looking southeast across the Ewa Plain towards the proposed project site. This key view represents the perspective of the residential viewer group within the mauka landscape unit.
• Viewpoint 2: Varona Village looking northwest towards the Waianae Mountain Range and northeast towards Tenney Village. This key view represents the perspective of the residential viewer group within the makai and historic district landscape units.
• Viewpoint 3: Ewa Villages Golf Course looking north towards the Waianae Mountain across the Ewa Plain. This key view represents the perspective of the recreational viewer within the makai landscape unit.
• Viewpoint 4: Future North-South Road looking north or south towards the Waianae Mountains or ocean respectively. This key view represents the perspective of the motorist viewer group within the makai landscape unit.

Evaluation of visual impacts considers the physical changes that would occur within the view-frame of the selected key views. Physical changes are evaluated based on how they would affect the existing visual environment in relation to its vividness, intactness, and unifying theme. It should be noted that viewer sensitivity to visual changes can vary, affecting the perceived impact of physical changes within a selected view-frame.

3.13.2.2 VISUAL IMPACTS

The No-Build Alternative would include construction of the portion of Kapolei Parkway between Renton Road and North-South Road, a roadway that would provide up to six travel lanes, a landscaped median and sidewalks, and a bike/pedestrian path. The physical appearance of the proposed portion of Kapolei Parkway would be similar to the section of Kapolei Parkway in Ewa by Gentry and Renton Road because of the opportunity to provide large shade trees in the median and smaller trees along sidewalks.

Under the Build Alternative, the physical appearance of North-South Road would be similar to portions of Fort Weaver Road as well as to Kapolei Parkway, and would include a landscaped median with large shade trees and landscaped sidewalks.
Neither the proposed portion of Kapolei Parkway nor North-South Road would be elevated on a viaduct structure at any point along their alignments. However, North-South Road would be raised a few feet above the existing grade so that it would not be vulnerable to flooding (see Section 3.8).

**Viewpoint 1**

From Viewpoint 1, distant vistas of the island (e.g., Honolulu) and ocean are available. In addition, the Ewa Plain, with its substantial development of mostly low-density residences, is highly visible from this key view.

Under the No-Build Alternative, the proposed portion of Kapolei Parkway between North-South Road and Renton Road, located to the far southeast of this viewpoint, would be barely visible due to its distance from this vantage point within the context of the vast views available. Kapolei Parkway would be surrounded by existing and additional proposed urban uses (see Section 3.1). The surrounding and anticipated additional development would make it difficult to see the proposed roadway from Viewpoint 1. The introduction of the proposed portion of Kapolei Parkway into this key view would fit within the urban context of the views available from this vantage point.

Similarly, under the Build Alternative, the distance of this viewpoint from the proposed project and the vast views available from this vantage point would make the introduction of North-South Road less obtrusive within the context of overall views. More importantly, the proposed North-South Road would share the same corridor as the 138 kV power poles. These power poles are visible within this key view because of their size (built to hurricane standards and capacity), color (white), and their surroundings—a plain of relatively low vegetation or bare soil. It is anticipated that the 138 kV power poles would remain the more prominent feature. North-South Road’s landscaping and night-time illumination would be visible from Viewpoint 1, but would be limited in scale due to the proposed road’s distance from the viewpoint. In addition, the area surrounding North-South Road is planned for urban development (See Section 3.1). Future development within this area would provide an urban context for the proposed North-South Road, allowing it to blend into the surrounding development. Therefore, the Build Alternative would not result in an adverse impact with respect to Viewpoint 1.

**Viewpoint 2**

From Viewpoint 2, views are available of the distant Waianae Mountain Range and the adjacent Tenney Village, which is located north of the proposed Kapolei Parkway Corridor. Relatively flat topography, surrounding vegetation, and adjacent houses somewhat limit the views from this viewpoint to the immediate surrounding area.

Under the No-Build Alternative, the proposed portion of Kapolei Parkway would be in close proximity to this key view. The proposed portion of Kapolei Parkway would be an at-grade facility, but would feature large shade trees that could block views of the Waianae Mountain Range from certain vantage points within Varona Village. The proposed roadway also includes street lighting, which would increase night-time
illumination within the project vicinity, and vehicle headlights would also be a new source of glare within the area. Although, the perspective from Viewpoint 2 represents the historic district landscape unit, the introduction of Kapolei Parkway between Renton Road and North-South Road within this key view would not be out of character within this urbanized area of Ewa. The physical appearance of the proposed portion of Kapolei Parkway would be similar to Renton Road, a roadway that is consistent with this district’s historic character. See Section 3.10 for an additional discussion of maintaining the view corridor along Renton Road in the Ewa Villages Historic District.

Under the Build Alternative, North-South Road would be constructed, but would not be visible from this viewpoint. Therefore, no visual impacts associated with the Build Alternative are anticipated within Viewpoint 2.

**Viewpoint 3**

Viewpoint 3 is located in the Ewa Villages Golf Course and represents the perspective of the recreational viewer group within the makai landscape unit. The Ewa Villages Golf Course is surrounded by a vegetative buffer that separates it from the adjacent Tenney Village and open Ewa Plain. Where the golf course fairway is elevated above the surrounding vegetation, extended views of the Ewa Plain, the Wai‘anae Mountain Range, and the rising Central Oahu plateau are available. West, north, and northeast of this key view is the proposed North-South Road alignment. The Kapolei Parkway alignment is south of this viewpoint.

Under the No-Build Alternative, the proposed portion of Kapolei Parkway between Renton Road and North-South Road would be more or less visible depending on the amount of vegetation bordering the course, elevation of the fairway, and proximity of the golf course to the proposed roadway alignment at any given point. Under future conditions, additional urban development proposed for the areas surrounding the roadway would block views of the proposed roadway from this viewpoint. Moreover, introduction of the proposed portion of Kapolei Parkway within this key view would not be out of character with the surrounding urban environment and would have little impact on the recreational viewer group.

Under the Build Alternative, the proposed North-South Road would be more or less visible, again depending on the amount of vegetation bordering the course, elevation of the fairway, and proximity of the golf course to the proposed roadway alignment at any given point. It is anticipated that the 138 kV power poles would remain the most prominent visual feature within this key view. In addition, the area surrounding North-South Road is planned for urban development, which is anticipated to have more of an impact within the makai landscape unit than North-South Road from the perspective of Viewpoint 3. North-South Road would also represent a prominent element within the relatively flat terrain of the makai landscape unit. However, in the context of visual disruption already caused by the 138 kV power poles, the proposed road would not affect the overall visual context of this key view and would have little impact on the recreational viewer group.
Viewpoint 4

Viewpoint 4 represents future views from the proposed North-South Road. Motorists and other users traveling on the new roadway would have views of the surrounding Ewa Plain, shoreline, and mauka areas, including the Waianae Mountain Range and the rising Central Oahu plateau.

Since Viewpoint 4 depends on the completion of North-South Road, it would not be available under the No-Build Alternative.

Under the Build Alternative, motorists and other users of North-South Road would have views of the Ewa Plain and mauka and makai areas. Views east across the Ewa Plain would be periodically disrupted by the 138 kV power poles. Future development adjacent to the proposed North-South Road, including the Hawaiian Homesteads development and the UH-West Oahu campus (see Section 3.1), would change the makai landscape unit from mostly open space to an urban environment. Views of the surrounding Ewa Plain would become increasingly limited. Views of the distant Waianae Mountain Range are anticipated to remain available from the new North-South Road, but may be somewhat limited by future land uses and roadway landscaping. Views of the rising Central Oahu plateau would be blocked somewhat by the Interstate H-1 Freeway, which is built on top of an embankment. Also, future development on the north side of Farrington Highway, as provided in the Ewa DP, may also block views.

3.13.3 MITIGATION MEASURES

Both North-South Road and the portion of Kapolei Parkway, from Renton Road and North-South Road, will be designed urban “parkways”, featuring ample landscaping and sidewalks. In the context of existing and planned urban development, neither the proposed portion of Kapolei Parkway nor North-South Road are anticipated to represent a visually obstructive addition to the Ewa viewshed. Therefore, mitigation is not necessary.

3.14 CONSTRUCTION IMPACTS AND MITIGATION

This section describes the impacts and mitigation measures associated with construction of North-South Road, including its interchange with the H-1 Freeway and drainage appurtenances, and the federalization of the section of Kapolei Parkway between North-South Road and Renton Road, which are all part of the Build Alternative. The construction of the section of Kapolei Parkway between the proposed North-South Road and Renton Road by the City and County of Honolulu are assumed under the No-Build Alternative. Discussion of construction impacts of this and other projects assumed under the No-Build Alternative, such as the widening of Farrington Highway and Fort Weaver Road, is beyond the scope of this FEA/FONSI.
3.14.1 MAINTENANCE OF TRAFFIC

Construction of North-South Road would occur mostly on agricultural lands that are either fallow or active for cultivation of diversified crops (see Sections 3.1.1.3 and 3.2). Therefore, impacts to existing traffic flows would not occur during most construction activities. Traffic flow impacts would occur at certain construction site ingress and egress areas, and when work is being conducted on Farrington Highway and on the Interstate H-1 Freeway. Traffic impacts at these locations may include lane closures and/or detours, which would cause delay to motorists. During the project's design stage, a traffic plan will be developed, in order to maintain the traffic flow through the area during the project's construction.

A substantial amount of excavation will occur to construct the project's drainage features. It is estimated that the total volume of excavated material may exceed the project's requirements for fill material by approximately 500,000 cubic yards. Storage and disposal of the excess excavated material will be the responsibility of the contractor since no provision has been made for large-scale stockpiling in the project vicinity.

3.14.2 AIR QUALITY

3.14.2.1 POTENTIAL IMPACTS

Air quality impacts during roadway construction generally consist of fugitive dust and mobile source emissions from construction vehicles and equipment. The latter source is expected to cause minimal impacts because carbon monoxide (CO), the principal pollutant of construction vehicles, is most serious under localized (microscale) conditions. Most of the construction activities would occur away from sensitive receptors, such as residences.

Fugitive dust is airborne particulate matter and is usually relatively large in particle size. Fugitive dust would be generated by construction vehicles operating around the construction sites and material blown from uncovered haul trucks, stockpiles and exposed areas.

The dispersion of fugitive dust depends on particle size, emission height, and wind speed. Small particles (30 to 100 micron range) can travel several hundred feet before settling to the ground, depending on wind speed. However, most fugitive dust is made up of relatively large particles (i.e., particles greater than 100 microns in diameter). Given their relatively larger size, these particles tend to settle within 20 to 30 feet of their source.

Construction activities must comply with provisions of Hawaii Administrative Rules (HAR), Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33, Fugitive Dust. The contractor will provide adequate measures to control dust from all construction areas and during the various phases of construction. Wind screens have been used on previous projects in Ewa. Other measures include watering open areas.
3.14.2.2 MITIGATION MEASURES

The following particulate control measures related to construction activities will be followed:

1. Plan the different phases of construction, focusing on minimizing the amount of dust generating materials and activities, centralizing on-site vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact.

   A. Site Preparation:
      - provide an adequate water source at the site prior to the start up of construction activities;
      - minimize land disturbance;
      - use watering trucks to minimize dust;
      - cover trucks when hauling dirt;
      - stabilize the surface of dirt piles if not removed immediately;
      - use dust screens effectively;
      - limit vehicular paths and stabilize temporary roads; and
      - to the maximum degree possible, pave all unpaved construction roads and parking areas to road grade for a length no less than 50 feet from where such roads and parking areas exit the construction site, to prevent dirt from washing onto paved roadways.

   B. Construction:
      - cover trucks when transferring materials;
      - use dust suppressants on traveled paths that are not paved;
      - minimize unnecessary vehicular and machinery activities; and
      - minimize dirt track-out by paving site exit road just before entering the public road.

   C. Post-Construction:
      - landscape and rapidly cover bare areas, including slopes, starting from the initial grading phase;
      - restore to original conditions any disturbed land not used;
      - remove unused material and dirt piles; and
      - restore to original condition all vehicular paths created during construction and prevent future off-road vehicular activities.

2. Provide adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities, and

3. Control dust from debris hauled away from project site.
3.14.3 NOISE AND VIBRATION

3.14.3.1 POTENTIAL IMPACTS

Because construction would involve the use of heavy machinery, there would be temporary noise impacts from construction activities. Table 3.14-1 presents maximum noise levels (Lmax) of heavy mobile construction equipment and compressors measured at a distance of 50 feet. These noise levels are estimates based on minimal site-specific data. Therefore, due to the preliminary nature of this analysis, specific impacts cannot be accurately determined without a detailed construction plan. However, construction would normally occur during daylight hours when occasional loud noises are more tolerable. Because of the relatively short-term exposure to any one receptor and because receptors are not located near the construction site, extended disruption of normal activities is not considered likely.

Table 3.14-1: Construction Equipment Noise Levels

<table>
<thead>
<tr>
<th>Source</th>
<th>Lmax(dBA) at 50 feet</th>
<th>Model Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backhoe</td>
<td>85</td>
<td>John Deere 609A</td>
</tr>
<tr>
<td>Front Loader</td>
<td>84</td>
<td>Caterpillar 980</td>
</tr>
<tr>
<td>Dozer</td>
<td>84</td>
<td>Caterpillar D7e</td>
</tr>
<tr>
<td>Groomer</td>
<td>91</td>
<td>Caterpillar 18</td>
</tr>
<tr>
<td>Scraper</td>
<td>92</td>
<td>Caterpillar 660</td>
</tr>
<tr>
<td>Compressor</td>
<td>80-89</td>
<td>Various Tested</td>
</tr>
</tbody>
</table>


Activities associated with the construction phase of the project must comply with Hawaii State Department of Health (HDOH) HAR, Chapter 11-46, "Community Noise Control." The general contractor will likely obtain a noise permit from the HDOH, which will allow him or her to exceed the Community Noise Control Standards during periods in which construction is allowed (i.e., 7 a.m. to 6 p.m. on weekdays and 9 a.m. to 6 p.m. on Saturdays).

Nighttime construction would lessen the overall construction duration. HDOT often chooses to conduct nighttime construction on its freeways to lessen impacts to traffic flow. There is likely to be some nighttime construction on this project. Night work is anticipated at H-1 Freeway during the interchange construction to minimize potential traffic disruption. If HDOT chooses to conduct nighttime construction, a noise variance from HDOH will be required. The noise variance will specify conditions, such as the use of certain construction equipment during certain periods of the evening (e.g., no jack hammering after 9 or 10 p.m.). The project will not exceed the stipulated noise limits unless a variance is granted by HDOH.
3.14.3.2 MITIGATION MEASURES

The following measures will be implemented to minimize adverse construction noise impacts:

- A noise permit will be obtained if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in HAR, Chapter 11-46-6(a), and/or obtaining a noise variance, if nighttime construction is planned;
- The contractor will be required to comply with the requirements pertaining to construction activities, as specified in the rules and the conditions issued with the noise permit and/or variance as stated in HAR, Chapter 11-46-7(c)(4); and
- Construction equipment and on-site vehicles with exhaust of gas or air will be equipped with mufflers in good working order as stated in HAR, Chapter 11-46-6(b)(1)(A).

3.14.4 WATER RESOURCES

3.14.4.1 POTENTIAL IMPACTS

During construction, there would be an increased potential for silt erosion and sediment transport due to grading and removal of vegetation. Sediment loading of stormwater could occur when unstabilized, exposed soil at excavations or stockpiles of excavated material experience heavy rains.

As described in Sections 2.1 and 3.8, North-South Road would cross Kalo Gulch at two locations. Preliminary plans for the project show that the bridges would span the gulch. Culverts will be constructed where North-South Road would cross the Kalo Gulch. The culverts would allow North-South Road to cross the Gulch while maintaining the Kalo Gulch streambed and allow runoff to flow in its natural direction (Addendum To Technical Memorandum Kalo Gulch Interim Drainage Plan, 2002).

3.14.4.2 MITIGATION MEASURES

The following measures will minimize adverse construction impacts on water resources:

To prevent sedimentation of stormwater flows from the construction site, a site-specific best management practices (BMP) plan will be prepared, which is required to obtain general permit coverage under the National Pollutant Discharge Elimination System (NPDES) permit for discharges associated with construction activities. The BMP plan will include specific erosion control measures, including provisions for construction staging, equipment maintenance and storage, and other such activities, subject to review and approval by HDOH.
North-South Road would cross Kaloi Gulch at two locations. These crossings are subject to U.S. Department of the Army (DA) authorization pursuant to Section 404 of the federal Clean Water Act (CWA). Support structures in the gulch are considered to be "dredge" or "fill" material within the "ordinary high water mark" of "waters of the U.S." and will require a DA Section 404 Nationwide permit. If DA authorization were required per CWA Section 404, the project will also require Water Quality Certification (WQC) from HDOH pursuant to CWA Section 401. The WQC requires an approved site-specific BMP plan, among other stipulations, to prevent water pollution in the gulch.

### 3.14.5 SOLID AND HAZARDOUS WASTE

#### 3.14.5.1 POTENTIAL IMPACTS

Construction will require clearing, land, and excavation. Resultant spoil, consisting of soil, vegetation, and other materials, will be transported to approved disposal sites; or, in the case of excavated materials, the resultant spoil will be used elsewhere on the project as fill. Areas to be used for spoil disposal will be identified during final design. A grading, grubbing, stockpile, and excavation permit will be obtained from the City and County of Honolulu Department of Planning and Permitting.

A substantial amount of excavation would occur to construct the project’s drainage features. It is estimated that the total volume of excavated material may exceed the project’s requirements for fill material by approximately 500,000 cubic yards. Storage and disposal of the excess excavated material will be the responsibility of the contractor since no provision has been made for large-scale stockpiling in the project vicinity. The contractor will meet all applicable requirements pertaining to the storage and disposal of the excavated material.

Construction would also generate solid waste, some of which would be considered hazardous or toxic if not properly handled or disposed of, such as detergents, paints, metal, tar, petroleum-based products and cleaning solvents.

#### 3.14.5.2 MITIGATION MEASURES

During construction, all waste material will be collected and stored in a securely lidded metal dumpster that meets all State of Hawaii and City and County of Honolulu solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be transported to a HDOH approved solid waste disposal or recycling facility. No construction waste material will be buried on site. The contractor will be responsible for implementing the correct procedures for waste disposal. Notices stating these practices will be posted in the office trailer, and the contractor will be responsible for ensuring that these procedures are followed.

All sanitary waste generated during the construction phase will be collected from portable units as required.
The contractor will be instructed to recycle greenwaste.

The following material management practices addressing good housekeeping and hazardous products will be used to reduce the risk of spills or other accidental exposure of materials and substances to the environment. A Spill Prevention Plan will be proposed and followed by the contractor.

1. Good Housekeeping
   - An effort will be made to store only enough product required to complete the job;
   - All materials stored on site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure;
   - Products will be kept in their original containers with the original manufacturer’s labels affixed;
   - Substances will not be mixed with one another unless recommended by the manufacturer;
   - Whenever possible, all of a product will be consumed before disposing of the container;
   - Manufacturer’s recommendations for proper use and disposal will be strictly followed; and
   - The contractor will conduct a daily inspection to ensure proper use and disposal of materials on site.

2. Hazardous Products
   - Products will be kept in original containers unless they are not resealable;
   - Original labels and materials safety data will be retained; and
   - If surplus product must be disposed of, manufacturer’s or local and State-recommended methods for proper disposal will be followed.

3. Petroleum Products
   - All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage.
   - Petroleum products will be stored in tightly sealed, clearly labeled containers. Any asphalt substances used on site will be applied according to the manufacturer’s recommendations.
   - Vehicle servicing and maintenance activities will not pollute the environment.

4. Paints
   - All containers will be tightly sealed and stored when not in use. Excess paint will not be discharged on-site but will be properly disposed of according to manufacturer’s instructions or State and local regulations.

5. Spill-Control Practices
   In addition to the good housekeeping and material management practices discussed previously, the following practices will be implemented for spill prevention and clean-up:
- Manufacturer's recommended methods for spill clean-up will be clearly posted, and site personnel will be informed of the procedures and the location of the information and clean up supplies.
- Materials and equipment necessary for spill clean-up will be kept in the material storage area on site.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury due to contact with hazardous substances.
- Regardless of their size, spills of toxic or hazardous materials will be reported to the HDOH and the appropriate City and County of Honolulu agency.
- The spill prevention plan will be adjusted to include measures to prevent spills from re-occurring. A description of the spill, its cause, and the clean-up measures used will be included.
- The contractor will coordinate spill prevention and clean-up efforts. In addition, the contractor will designate at least three site personnel to receive spill prevention and clean-up training. These individuals will each be responsible for a specific phase of prevention and clean-up. The names of responsible spill personnel will be posted in the material storage area and in the office trailer on site.

Although hazardous materials sites are unlikely to be encountered during construction, the contractor will report to HDOT and HDOH any undiscovered undocumented storage sites, hazardous materials releases, or potential signs of contamination when soil is excavated. If any contaminants are encountered during construction, they will be handled according to applicable HDOH requirements.

3.14.6 HISTORIC AND ARCHAEOLOGICAL RESOURCES

As is described in Section 3.10.1, the project site, or the area affected by construction, is highly unlikely to contain archaeological resources mainly due to past agricultural activities. In the exceedingly unlikely event that a burial or other findings are unearthed during excavation, work in the vicinity will stop immediately and the SHPD will be notified in accordance with HRS Chapter 6E. Construction will resume only upon approval of the appropriate authorities.

3.14.7 THREATENED AND ENDANGERED SPECIES

3.14.7.1 POTENTIAL IMPACTS

As described in Section 3.7, five clusters of the endangered plant Kooloaula (Abutilon menziesii) were identified at or near the proposed roadways (see Figure 3.7-1). The construction of the No-Build Alternative would require removal of three endangered Kooloaula plants on City property within the ROW of the Kapolei Parkway corridor between Renton Road and North-South Road.
CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S) IMMEDIATELY FOLLOWING
The contractor will be instructed to recycle greenwaste.

The following material management practices addressing good housekeeping and hazardous products will be used to reduce the risk of spills or other accidental exposure of materials and substances to the environment. A Spill Prevention Plan will be proposed and followed by the contractor:

1. Good Housekeeping
   - An effort will be made to store only enough product required to complete the job;
   - All materials stored on site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure;
   - Products will be kept in their original containers with the original manufacturer's labels affixed;
   - Substances will not be mixed with one another unless recommended by the manufacturer;
   - Whenever possible, all of a product will be consumed before disposing of the container;
   - Manufacturer's recommendations for proper use and disposal will be strictly followed; and
   - The contractor will conduct a daily inspection to ensure proper use and disposal of materials on site.

2. Hazardous Products
   - Products will be kept in original containers unless they are not resealable;
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   - If surplus product must be disposed of, manufacturer's or local and State-recommended methods for proper disposal will be followed.

3. Petroleum Products
   - All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage.
   - Petroleum products will be stored in tightly sealed, clearly labeled containers. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.
   - Vehicle servicing and maintenance activities will not pollute the environment.

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   - All containers will be tightly sealed and stored when not in use. Excess paint will not be discharged on-site but will be properly disposed of according to manufacturer's instructions or State and local regulations.

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- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury due to contact with hazardous substances.
- Regardless of their size, spills of toxic or hazardous materials will be reported to the HDOH and the appropriate City and County of Honolulu agency.
- The spill prevention plan will be adjusted to include measures to prevent spills from re-occurring. A description of the spill, its cause, and the clean-up measures used will be included.
- The contractor will coordinate spill prevention and clean-up efforts. In addition, the contractor will designate at least three site personnel to receive spill prevention and clean-up training. These individuals will each be responsible for a specific phase of prevention and clean-up. The names of responsible spill personnel will be posted in the material storage area and in the office trailer on site.

Although hazardous material's sites are unlikely to be encountered during construction, the contractor will report to HDOT and HDOH any undiscovered undocumented storage sites, hazardous materials releases, or potential signs of contamination when soil is excavated. If any contaminants are encountered during construction, they will be handled according to applicable HDOH requirements.

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As is described in Section 3.10.1, the project site, or the area affected by construction, is highly unlikely to contain archaeological resources mainly due to past agricultural activities. In the exceedingly unlikely event that a burial or other findings are unearthed during excavation, work in the vicinity will stop immediately and the SHPD will be notified in accordance with HRS Chapter 6E. Construction will resume only upon approval of the appropriate authorities.

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3.14.7.1 POTENTIAL IMPACTS

As described in Section 3.7, five clusters of the endangered plant Kooloaula (Abutilon menziesii) were identified at or near the proposed roadways (see Figure 3.7-1). The construction of the No-Build Alternative would require removal of three endangered Kooloaula plants on City property within the ROW of the Kapolei Parkway corridor between Renton Road and North-South Road.
The construction of the Build Alternative would have both direct and indirect impacts on the plant population. Direct impacts would consist of removal of a total of 24 plants in both the North-South Road Corridor and the Kapolei Parkway Corridor between Renton Road and North-South Road. Of these, 21 plants would be affected by North-South Road and its drainage features, while the other three would be the same as those affected under the No-Build Alternative. The proposed North-South Road ROW is currently owned by the State and the Estate of James Campbell; Kooloaula is present only on the State-owned portion.

The remaining plants in Ewa and Kapolei would not be directly affected by the project. Potential indirect impacts to these remaining Kooloaula include wildfires and increased air pollution, which are associated with more urbanization and construction activities.

### 3.14.7.2 MITIGATION MEASURES

In accordance with the HCP (see Appendix H), the contractor will contact DLNR prior to clearing and grubbing activities. The contractor will assist DLNR regarding the removal of the endangered plants. Propagules from plants not directly impacted by the proposed project will be grown and represented in three offsite locations, including the Koko Crater Botanical Garden, Kaena Point State Park and Honolulu National Wildlife Refuge on Oahu (see HCP). The contractor will coordinate with DLNR regarding the location/marking of the contingency reserve area. In addition, the Incidental Take License allows for the removal of the entire Kapolei population of Kooloaula. These plants may be transplanted to other "wild" site locations. A Certificate of Inclusion will be required for the proposed Kapolei Parkway segment between Renton Road and North-South Road.

The construction contractor will be required to initiate fire prevention measures during roadway construction to minimize the indirect impact associated with fire risk. Measures will include the preparation of a construction-specific Fire Control Plan by the contractor. The Fire Control Plan will address such topics as construction of a firebreak, presence of a water truck at all times, construction worker education, reporting, and response procedures in the event of a fire, and procedures for the storage and disposal of flammable materials, including matches and cigarettes.

### 3.14.8 AGRICULTURAL ACTIVITY

There would be construction-phase impacts on agricultural activities occurring on adjacent parcels. These impacts and proposed mitigation measures are discussed in Section 3.2.4.
3.15 CUMULATIVE AND SECONDARY IMPACTS

3.15.1 METHODOLOGY

According to FHWA's "Position Paper on Secondary and Cumulative Impact Assessment" (August 20, 1992), the 1978 regulations of the Council on Environmental Quality (CEQ) implementing NEPA (1969) require agencies to examine the indirect consequences of all proposed federal activities and programs. These consequences may occur in areas beyond the immediate influence of a proposed action and at some time in the future. CEQ guidelines for implementing NEPA broadly define both cumulative and secondary impacts as follows:

Cumulative effects are impacts which result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions (40 CFR 1508.7). These impacts are less defined than secondary effects. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Secondary effects are those that are "caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable" (40 CFR 1508.8). Generally, these impacts are induced by the initial action. They comprise a wide variety of secondary effects, such as changes in land use, water quality, economic vitality and population density. Effects and impacts as used in these regulations are synonymous.

The purpose of cumulative effects analysis is to ensure that federal agencies consider the full range of consequences of actions related to project activities. NEPA, the CEQ regulations, and Hawaii's environmental impact statement law (Hawaii Revised Statutes Chapter 343 [HRS 343]), require analysis of cumulative issues within the context of the action, alternatives, and effects. The context of cumulative analyses includes resources, ecosystems, and human communities considered over a meaningful geographic area and through time (past, present, and future).

The time frame for the cumulative analysis is the 20-year design life of the proposed project after construction. The 20-year time frame was selected, because it is the maximum period of time that a given transportation facility is typically assumed to remain effective and has a contributing influence on the regional transportation system.

A detailed methodology was prepared for analyzing cumulative impacts, as well as secondary impacts, in the Cumulative and Secondary Impacts Report (Parsons Brinckerhoff, 2004), which is included in Appendix N.

The geographic area encompassed by this cumulative impacts analysis is the Ewa Plain, as shown in Figure 3.15-1. This geographic area was determined by considering existing natural, physical, environmental, and socioeconomic conditions of the area, and examination of existing and planned development projects in the Ewa Plain that would potentially utilize or be affected by the proposed North-South Road and/or the portion of Kapolei Parkway between Renton Road and North-South Road. The geographic
boundaries encompassed by this cumulative impacts analysis include lands in the vicinity of the proposed project alignments, from the H-1 Freeway makai to the Pacific Ocean, and from Pt. Weaver Road west to Farrington Highway past Ko Olina. The existing and planned projects within this area were assumed as part of the baseline existing conditions for this cumulative impacts analysis. These projects are described in Section 3.1.

Depending on the status of a particular project, each of the projects included in this cumulative impacts analysis is supported by different levels of available information. Public documents, conceptual plans, documents or applications prepared as part of the environmental review or regulatory processes were the primary sources of information. When adequate information on specific aspects of other projects was not readily available, nor could be obtained through reasonable efforts, professional judgment was used to analyze potential impacts.

One of the primary sources of information about the future development of the Ewa Plain is the Ewa Development Plan (DP) issued by the City and County of Honolulu Department of Planning and Permitting (August 1997, Revised May 2000). The Ewa DP is based on the City’s General Plan, which designated Ewa and specifically Kapolei as a Secondary Urban Center for Oahu. This “Second City” is the focus of major economic activity and housing development, and a center for government services, with residential development of fringe areas in Ewa and Central Oahu.

It should be noted that the Ewa DP includes the construction of the North-South Road and completion of Kapolei Parkway as integral components of the plan. Both roads are shown on figures in the Ewa DP, including the Open Space Map, the Urban Land Use Map, and the Phasing Map.

3.15.2 PROJECTS CONSIDERED FOR CUMULATIVE ANALYSIS

Substantial residential growth would occur primarily in master planned communities in the Ewa Plain. Almost 28,000 new residential units are anticipated by 2020, including the City of Kapolei, Ewa by Gentry, Ocean Pointe, Ewa Villages, Ko Olina, Laulani, Makaiwa Hills, Makakilo, the Villages of Kapolei, and an area some refer to as East Kapolei. The Ewa DP calls for these communities to be designed to meet a wide range of housing needs, including affordable units, starter homes, large multi-family and single family units, as well as housing for students going to school at the UH-West Oahu campus.

A key element of the vision put forth in the Ewa DP is the creation of the Secondary Urban Center, which would provide a wide range of jobs: visitor and activity centers in Ko Olina and Ocean Pointe (formerly called Ewa Marina); heavy and light industrial areas near the Kalaeloa Barbers Point Harbor; offices and retail centers in the City of Kapolei, and community and neighborhood centers. The Ewa DP anticipates that job growth would be as substantial as housing growth, increasing from 17,000 jobs to more than 64,000 jobs in 2020.
3.15.2.1 TRANSPORTATION PROJECTS

The following transportation projects described in Chapter 2 are planned for the Ewa Plain:

Kunia Road/Fort Weaver Road Corridor
- Widen Fort Weaver Road from 4 to 6 lanes between Farrington Highway and Geiger Road

Fort Barrette Road/Makakilo Drive Corridor
- Widen Fort Barrette Road from 2 to 4 lanes between Farrington Highway and F.D. Roosevelt Avenue
- Extend Makakilo Drive east to H-1 Freeway to provide second access point for Makakilo

Interstate H-1 - Interchange Improvements
- Makakilo Interchange – Construct new westbound on-ramp
- Kapolei Interchange – Construct new interchange between Makakilo and Palailai Interchanges
- Palailai Interchange – Improve existing interchange

Farrington Highway Corridor
- Widen Farrington Highway from 2 to 4 lanes between Kapolei Golf Course Entrance and Fort Weaver Road
- Widen Farrington Highway from 2 to 4 lanes between Kamokila Boulevard and Kualoa Boulevard

Kapolei Parkway Corridor
- Completion of various Kapolei Parkway segments between Kapolei and Ewa Beach

Other Roadway Improvements
- Construct new westbound Frontage Road between Makakilo Drive and Kualoa Boulevard

In addition to the improvements listed in the TOP 2025 (above), the following roadway improvements are also assumed:

- Existing Palehua Road is assumed to remain for the No-Build Alternative. It is a 2-lane roadway that currently crosses under the H-1 Freeway in the vicinity of the proposed North-South Road Interchange. It is also assumed that, as part of the build-out of the Makakilo subdivision, this roadway would be extended to provide secondary access to Makakilo from the H-1 Freeway.
- East-West Connector Road would be a new east-west, major collector roadway that intersects Farrington Highway in the vicinity of the existing Kapolei Golf Course Entrance at its western terminus, and Fort Weaver Road opposite of Aawa Drive at its eastern terminus. Old Fort Weaver Road would be reconfigured to intersect the East-West Connector Road as a T-intersection. This roadway would
provide access to future development in the East Kapolei area located between the "Villages of Kapolei" and Fort Weaver Road. This roadway would also provide sub-regional circulation for this area.

The TOP 2025 encourages and assumes the implementation of TDM actions to reduce vehicular travel during peak traffic hours. Key TDM actions that are recommended in the TOP 2025 and assumed for all alternatives are ridesharing, work behavior changes, TMA, alternative transportation modes, and parking management actions.

3.15.2.2 OTHER EXISTING AND PLANNED PROJECTS

The following existing development projects were included in this analysis. See Section 3.1 for descriptions of anticipated growth plans for these existing projects.

- Ewa Villages
- Ewa Beach
- Ewa by Gentry
- Makakilo
- Villages of Kapolei
- West Loch Estates and West Loch Fairways
- James Campbell Industrial Park
- Kalaeluca (formerly BPNAS)
- Kapolei Business Park
- City of Kapolei
- Honolulu
- Ko Olina
- Ocean Pointe

The following projects are planned for the Ewa Plain area. See Section 3.1 for descriptions of these planned projects.

- DHHL
- UH-West Oahu Campus
- East Kapolei Area
- Mehana

3.15.3 POTENTIAL CUMULATIVE IMPACTS

3.15.3.1 TRANSPORTATION PROJECTS

Future traffic improvements within the Ewa Plain and Central Oahu region would be developed independently of the proposed project improvements. However, they provide linkages within the local and regional transportation system, as does the proposed project. With implementation of future transportation improvements, it is anticipated that all planned roadways and intersections would operate under improved conditions. The North-South Road and the proposed portion of Kapolei Parkway between Ranton Road...
and North-South Road would become a part of this improved system, and contribute to improving regional and sub-regional mobility, by improving network connectivity.

3.15.3.2 EXISTING PROJECTS

A number of existing projects in the Ewa Plain area, as noted above, include plans for expansion, which have been factored into the development of the Ewa DP and other related area community master plans. A key component of the Ewa DP as well as of various community master plans is the development of North-South Road, and the completion of the Kapolei Parkway segments. While the existing projects are not dependent upon the construction of North-South Road or the project segment of Kapolei Parkway, implementation of their expansion plans would be facilitated by the construction of the proposed project. In addition, if these projects were to continue to expand as planned, and the proposed project was not implemented, traffic conditions on area roadways, and the accompanying air quality impacts, would worsen.

3.15.3.3 PLANNED PROJECTS

Based on best available information, the cumulative impacts of planned projects, including North-South Road and the portion of Kapolei Parkway between Renton Road and North-South Road, were evaluated for each environmental resource and summarized in Table 3.15-1. Potential impacts of each development were evaluated in combination with the impacts from the proposed project and the other planned developments for each environmental resource, in order to determine the cumulative effects upon each resource.

The table indicates that some cumulative impacts would occur as a result of several planned projects, including North-South Road and the portion of Kapolei Parkway between North-South Road and Renton Road. However, none of these impacts would be unexpected, because of the widely anticipated effect of public policies and private enterprises to re-direct growth to the Ewa Plain and promote development of Kapolei as the Secondary Urban Center for Oahu. Table 3.15-1 indicates mitigation activities for anticipated cumulative impacts. Negative impacts would not be substantial, either because the actions are in support of and instrumental to the planned regional development for the area, or because the impacts would be addressed by mitigation proposed for this or other future projects.

3.15.4 SECONDARY IMPACTS

According to 40 CFR 1508.8, secondary impacts are impacts that have the potential to occur "later in time or farther removed in distance but are still reasonably foreseeable." For roadway projects, secondary impacts typically occur because urban development is induced by the project. Development is considered induced if it would not have occurred unless the roadway improvement was made. Induced development can cause additional environmental and social impacts than those directly associated with the road,
Table 3.15-1:
Cumulative Impacts of Planned Projects in the Area

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<tr>
<th>DISCIPLINE</th>
<th>POTENTIAL/ANTICIPATED IMPACTS</th>
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<tr>
<td>Land Use</td>
<td>State and local policies have designated the development of the Ewa Plain as the Secondary Urban Center of Oahu. The area surrounding North-South Road was master planned in the Ewa DP and Kapolei Area Long Range Master Plan for urban development. All planned projects appear to be consistent with existing plans for development of the Ewa Plain, including the permanent conversion of vacant or agricultural lands for urban uses. These projects are consistent with City and County plans and policies for the development of the Ewa Plain as the Secondary Urban Center of Oahu. Both Kapolei Parkway and North-South Road are part of this planned development. Proposed future development projects would occur regardless of which alternative is selected. The North-South Road and Kapolei Parkway project is not anticipated to induce more, or more intensive, development than what is already planned or anticipated. The North-South Road and Kapolei Parkway project would facilitate the development of DHHL homesteads and future development of the area called East Kapolei, but additional transportation infrastructure is necessary to support the projected urbanization of the Ewa Plain and to avoid undesirable traffic conditions upon full-build out of the Ewa Plain. The Build Alternative would also accelerate the development of other planned projects, but is not anticipated to result in unforeseen or unmitigated impacts, as described in the remainder of this table.</td>
</tr>
<tr>
<td>Geology, Soils, Farmland</td>
<td>Construction of North-South Road would convert approximately 190 acres of prime farmland, some of which is being actively cultivated under short-term leases. The portion of Kapolei Parkway, from Renton Road and North-South Road, would affect approximately 10 acres of prime farmland. Farms located mauka of the H-1 Freeway would lose their existing roadway access, because their current access road (Palikuwa Road) would be displaced by North-South Road. However, in the long-term, the area surrounding the project is planned for non-agricultural uses, and the existing short-term leases would not be continued. All planned projects involve the conversion of fallow agricultural land to urban use. This conversion is consistent with the Ewa DP plans for the development of this area as the Secondary Urban Center for Oahu. Urban growth would be contained within a boundary which would protect prime agricultural lands along Kunia Road and within the West Loch Naval Magazine Blast Zone for diversified agriculture (Ewa DP). Potential environmental impacts would occur primarily during construction activities at all sites, due to soil erosion, which should be mitigated by best management practices (BMPs) implemented by each developer.</td>
</tr>
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</table>
## DISCIPLINE: Transportation Infrastructure

Traffic congestion is an existing concern related to continued residential and commercial development in the area. The North-South Road and Kapolei Parkway project is included in a number of development plans (e.g., Ewa DP) in order to address and alleviate traffic congestion and improve access for the proposed developments in the Ewa Plain area. Although development would continue in the Ewa Plain with or without the North-South Road and Kapolei Parkway project, traffic conditions would be considerably worse without the project. Kapolei Parkway would also provide linkages between residential areas and employment centers, for both existing and planned developments.

Traffic conditions would be substantially improved along the congested Kunia Rd/Ft. Weaver Rd. Corridor. Similarly, traffic conditions would be improved along the Makakilo Dr./Ft. Barrette Rd. Corridor. North-South Road itself is projected to carry large traffic volumes, all of which would relieve other streets in the study area. Each of the future intersections along the North-South Road and the proposed portion of Kapolei Parkway, from Renton Road to North-South Road, including those at the H-1 Freeway interchange, are projected to operate at acceptable levels of service. Construction of North-South Road and the proposed portion of Kapolei Parkway would serve as an alternate route to access the greater Ewa area. The proposed project would provide additional roadway capacity in a high-growth area and would relieve key congested roads running parallel to it, such as Fort Weaver Road.

The North-South Road and Kapolei Parkway project would also provide subregional and regional access to the UH-West Oahu campus. An access road would connect the adjacent DH-HL residential area with the campus, thereby providing easy access to advanced education facilities for Hawaiian homesteaders.

## DISCIPLINE: Utilities Infrastructure

Utilities would be provided as a component of each of the proposed development projects. In addition, the City and County of Honolulu Board of Water Supply proposes to build a desalination facility at Kalaheo that would produce 5 MGD of freshwater for Oahu (Draft Environmental Impact Statement for the Proposed Kalaheo Desalination Facility, March 2003). The Honolulu Water Recycling Facility and Honolulu Wastewater and Sewage Treatment plants currently serve the area.

Construction and installation of water transmission lines would be coordinated with appropriate City agencies, and would conform to the East Kapolei Water Master Plan, which was prepared to support the HCDCH East Kapolei project (SWPP, Volume 5 – Island of Oahu, February 2003). The East Kapolei development is currently working with the BWS to acquire a water source for the water system. The potable (drinking water) system would interconnect with the Villages of Kapolei water system. The water system would provide service connections to the UH-West Oahu campus and Kalaheo Community District water systems. The Barbers Point Redevelopment Commission is coordinating source development with the BWS. (SWPP, Volume 5 – Island of Oahu, February 2003). Potable water, sewer, and non-potable water lines are planned to be co-located within North-South Road; utilities would also be placed under the proposed portion of Kapolei Parkway. Coordination of utilities with construction of the roadway would minimize long-term potential cumulative impacts, because such coordination would avoid repeated construction within the ROW and...
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<tr>
<th>DISCIPLINE</th>
<th>POTENTIAL/ANTICIPATED IMPACTS</th>
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<tr>
<td>Cycling Facilities</td>
<td>Existing cycling facilities in the general vicinity of the project area include a bike path along Fort Weaver Road from Farrington Highway to just north of Ewa Beach, and bike lanes on Fort Weaver Road in Ewa Beach. Bike paths are also provided in the Ewa Gentry community along Gelger Road, Kapolei Parkway, Kolowaka Drive, and Kaunui Drive. North-South Road and the proposed portion of Kapolei Parkway would be developed to include a parallel bike/pedestrian path and provide wide curb lanes that might be designated as a bike route. Therefore, no adverse cumulative impact is anticipated to cycling facilities. On the contrary, the proposed North-South Road and the proposed portion of Kapolei Parkway would contribute to the planned improvement of cycling facilities in the Ewa Plain.</td>
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<tr>
<td>Social, Cultural, Economic</td>
<td>The North-South Road and Kapolei Parkway project would improve linkages between residential areas and centers of employment in the Ewa Plain, as well as support its planned development as the Secondary Urban Center for Oahu. Construction of the North-South Road and Kapolei Parkway project would strengthen economic and social links between the Ewa Beach/Ocean Points/Ewa by Gentry area and the City and Villages of Kapolei by improving access to schools, libraries, and commercial establishments. Improving transportation infrastructure would also enhance emergency response services throughout the region. North-South Road and the proposed portion of Kapolei Parkway would provide more social, economic, and public services support to Ewa communities by providing a link to H-1 Freeway, as well as between existing and future communities. The North-South Road and Kapolei Parkway project would support development of other projects, by providing increased access to jobs, services, shopping, and community facilities for area residents - a socioeconomic benefit. As part of its residential development, DHHL would construct the portion of Kapolei Parkway between North-South Road and the existing cul-de-sac of Kapolei Parkway by the Villages of Kapolei, completing Kapolei Parkway between Ewa and Kapolei. When this occurs, traffic would increase on Kapolei Parkway. Current pedestrian improvements being implemented by HCDOH would enable Kapolei Parkway to accommodate the additional traffic while maintaining pedestrian safety.</td>
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<tr>
<td>Air Quality</td>
<td>Air quality in the Ewa Plain area should improve with the development of the North-South Road and Kapolei Parkway project, as traffic congestion is relieved on alternative roadways. Potential air quality impacts from construction activities would be short-term, consisting of soil erosion, fugitive dust, and machinery exhaust emissions. BMPs would be implemented to reduce soil erosion, fugitive dust, and machinery exhaust emissions to a minimal level. The proposed project would have to comply with all National and State Ambient Air Quality Standards.</td>
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<td>DISCIPLINE</td>
<td>POTENTIAL/ANTICIPATED IMPACTS</td>
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<td>Noise</td>
<td>Planned residential communities would be constructed either after or roughly simultaneously with North-South Road and Kapolei Parkway, and ambient noise conditions in the region would change as a result of overall urbanization. Noise impacts on currently undeveloped areas would be addressed by future developers, as each new development occurs. Table 3.6-4 in Section 3.6 shows recommended minimum setbacks where future residential development could potentially be located without noise abatement. Some residents in existing residential communities may experience some increased ambient noise levels from new or improved roadways such as the North-South Road and Kapolei Parkway project, and increased traffic levels, as the region overall continues to experience growth. The proposed project will comply with FHWA regulations (23 CFR 772) and State of Hawaii Department of Transportation, &quot;Noise Analysis and Abatement Policy&quot; (October 1996) on noise impacts.</td>
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<tr>
<td>Zoology</td>
<td>The North-South Road and Kapolei Parkway project would convert faunal habitats within the corridor to a roadway. However, it would not threaten the relatively common faunal communities in this region because the original natural habitats which once existed on these former agricultural lands, including within the corridor, have already been disturbed and the animals now present (cats, mongooses, mice) are considered nuisances and easily adapt to urban environments. Environmental documents prepared for proposed housing developments in the general vicinity of the proposed roadways reported similar findings.</td>
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<tr>
<td>Botany</td>
<td>The proposed project would result in the clearing of vegetation in both the North-South Road Corridor and the Kapolei Parkway Corridor between Renton Road and North-South Road, roughly 217 acres. With the exception of the endangered plant Koolauana (Abutilon menziesii), botanical surveys conducted for the project stated that the project corridor is overgrown with weedy plants, and is composed almost exclusively of introduced or alien species. Thus, vegetation communities that would be cleared by construction activities are not considered regionally important. Overall, proposed urban landscaping will replace the existing scrub vegetation and vacant properties. While anticipated regional development could have resulted in an adverse cumulative effect on Koolauana, simultaneous implementation of the Habitat Conservation Plan for A. menziesii at Kapolei, an integral part of the proposed North-South Road and Kapolei Corridor action, proposed active management of the endangered species. As a result of the HCP, the U.S. Fish and Wildlife Service issued a &quot;no jeopardy&quot; determination pursuant to Section 7 of the Endangered Species Act (see Chapter 4 and Appendix A) and the provisions of the HCP are anticipated to yield a net gain for the species. The HCP will provide for the continued survival of the Kapolei plant population through the establishment of three offsite wild populations and one offsite repository site from the degraded canefield population at Kapolei. The HCP also established a temporary plant reserve area and provided funding for maintenance work, in conjunction with the issuance of the incidental take license for A. menziesii.</td>
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<td>DISCIPLINE</td>
<td>POTENTIAL/ANTICIPATED IMPACTS</td>
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<td>Water Resources</td>
<td><strong>Groundwater:</strong> The EPA has stated that it is unlikely that the project would substantially affect the SOBA, which is a Sate Source Aquifer, especially with the proposed roadway drainage system and incident response procedures in place. The storm water system proposed for the northern section of North-South Road and its interchange with the H-1 Freeway would collect and convey roadway drainage and inadvertent spills along the roadway to a discharge point south of the caprock boundary.</td>
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<td><strong>Surface Water/Floodplains:</strong> The existing drainage in the area is characterized by intermittent streams and sheet flow. This drainage pattern is not consistent with regional plans for urban development. For the planned land use pattern to develop, the regional drainage will need to be modified so that drainage is retained, detained and channelized. These changes to regional drainage are needed to protect existing and future developments.</td>
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<td>Honolulu participates in the federal flood insurance program. Under that program, the County has the authority and obligation to review drainage plans. Approvals in this area are made in accordance with a MOU negotiated under the framework of a task force comprised of major stakeholders in the watershed, the Kaliol Gulch Task Force. Among other things, this MOU establishes fence line performance standards for drainage discharge. The MOU has been accepted by the County (Department of Planning and Permitting, DPP), and is consistent with the requirements that the County must meet to remain in the federal flood insurance program.</td>
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<td>The MOU produced by the Kaliol Gulch Task Force establishes the mechanism by which the City can approve drainage master plans prepared by the Task Force members that describe how current drainage is to be modified to accommodate planned development. This mechanism is for each development to contribute to the implementation of the regional drainage plan. The cumulative effect of each development will be to change the current drainage pattern in the region to one that harmonizes with the planned development in the area.</td>
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<td>As a key piece of mauka-makai linear infrastructure in the region, the North South Road and Kapolei Parkway project plays a central role in the provision of the ultimate regional drainage system. For example, the drainage channel to be constructed along the east side of the North South Road berm will become the conveyance spine for abutting developments. As adjacent developments occur, they will be designed to discharge to the North South Road drainage channel. Discharge rates will be in accordance with performance standards established by the Kaliol Gulch Task Force and the City's Rules Relating to Storm Drainage Standards as approved by the DPP. Adjacent developments will need to include basins and other measures to ensure that their fence line performance standard is met.</td>
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</table>
|                 | To avoid flooding, the capacity of the regional drainage channel will need to keep pace with the rate of development in the watershed. However, as described in Chapter 2, the proposed project disclosed and assessed in this document includes the drainage channel with ultimate capacity of 6,000 cfs at Farrington Highway and 7,400 cfs at the top of Ewa Villages. This is the appropriate capacity for full build-out in the watershed. There are several scenarios by which this ultimate capacity would be established, but, those scenarios do not affect the ultimate configuration, or the ultimate.
### DISCIPLINE | POTENTIAL/ANTICIPATED IMPACTS
---|---
Environmental | The intent of this document is to clear through the environmental review process the ultimate configuration of the project's contribution to the regional drainage system, independently of the details of how that ultimate configuration is achieved. In addition to the regional drainage channel, this project includes other features sized for ultimate regional requirements, such as culverts and cross-drains. It is logical for the initial roadway construction to include the ultimate sizing of these features to avoid subsequent roadway disturbance when the capacity of these features would need to be enhanced. This project also includes a retention/detention basin that is sized for accommodating roadway runoff increases. This basin may be increased or new basins may be added along the drainage channel by others as needed for accommodating runoff increases from their developments.

The DPP review process will ensure that adjacent developments not occur until the necessary components of the regional drainage system are constructed. If DPP does not conduct its site plan reviews of adjacent developments in this manner, the County's participation in the federal flood insurance program would be jeopardized due to an unlikely occurrence.

The North South Road and Kapolei Parkway project will also have direct impacts on current sheet flows in the area (see Chapter 3). North South Road will be placed on a berm that would alter the local drainage pattern by interrupting sheet flow across the Ewa Plain. An area north of Ewa Village will be excavated to function as a storm water retention area for drainage from North-South Road.

In summary, the cumulative effect of this project, in combination with other projects, will be to change the regional drainage system. However, this impact is not significant because it conforms with the regional drainage plan established by the Kalani Gulch Task Force and approved by DPP. Implementation of the regional drainage plan must occur through the cumulative action of future developments in the region in order for the future land use planned for this area to transpire.

Efforts to modify the floodplain would continue regardless of whether the North-South Road and Kapolei Parkway project is built. Floodplain modifications are required for the desired future land use to occur, and so future developments will contain features modifying the current drainage pattern.

| Hazardous Materials | Two potentially contaminated sites associated with the Ewa Sugar Mill/Oahu Sugar Co. were identified near the North-South Road and Kapolei Parkway project alignments. Although the mill property is near Kapolei Parkway, the main mill operations were located at least 1,000 feet from the alignment. No interaction with hazardous materials is expected.

The two sites should not affect nor be affected by planned projects. No additional hazardous materials sites would be affected or created because of any planned development projects, including North-South Road and Kapolei Parkway between Renton Road and North-South Road.
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<th>POTENTIAL/ANTICIPATED IMPACTS</th>
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<tr>
<td>Historic Resources</td>
<td>SHPD determined that the entire North-South Road and Kapolei Parkway project area would be within former sugarcane land and feels that no historic properties would be affected with regard to archaeology. The intersection of Kapolei Parkway with Renton Road would be within the Ewa Villages Historic District, although most of the road would be outside of the district. The alignment of Kapolei Parkway was master planned as part of the City’s efforts to re-develop the Ewa Villages Historic District, and the roadway does not require the displacement of any structure within the district. North-South Road and Kapolei Parkway from Renton Road to North-South Road, would be part of the roadway network contributing to increased traffic through the Ewa Villages Historic District and passing by other historic buildings in the area, such as the Ewa Hongwanji Mission. Other planned development projects would also contribute to the overall urbanization of the Ewa Plain, and increase traffic, including the intersection of Kapolei Parkway with Renton Road. However, these changes are not unexpected, because development in Ewa has been widely anticipated, and the approximate alignments of North-South Road and Kapolei Parkway between Renton Road and North-South Road are well known in the community. There should be no notable incremental impact on historic resources as a result of the North-South Road and Kapolei Parkway project.</td>
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<tr>
<td>Parks &amp; Recreation</td>
<td>Development of North-South Road and Kapolei Parkway between Renton Road and North-South Road would not require right-of-way from any existing park or recreational facility. Conversely, development of North-South Road and Kapolei Parkway would facilitate public access to parks and recreational facilities by improving regional mobility in Ewa for area residents. Traffic may increase on Kapolei Parkway, which is adjacent to public parks such as Geiger Park in Ewa by Gentry and Ewa Makana District Park. However, this change cannot be avoided due to the planned urbanization of the Ewa Plain.</td>
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<tr>
<td>Visual &amp; Aesthetic Resources</td>
<td>Both North-South Road and the proposed portion of Kapolei Parkway would be designed as urban “parkways,” featuring ample landscaping and sidewalks. In the context of existing and planned urban development, neither North-South Road nor Kapolei Parkway between Renton Road and North-South Road are anticipated to represent a visually intrusive addition to the Ewa viewed. Urbanization and development of the Ewa Plain in general and of the Secondary Urban Center at Kapolei in particular are major goals of the City and County of Honolulu. Construction of other planned development projects would alter visual resources by replacing the open, undeveloped views of the area with housing, commercial, and public facility developments. The North-South Road and Kapolei Parkway project would contribute only minimally to the change in the visual landscape, caused by the overall urbanization anticipated in the Ewa Plain. Both North-South Road and Kapolei Parkway are expected to be surrounded by new developments, and would become only one element of an urbanized landscape.</td>
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such as adversely affecting endangered and threatened species and taxing public infrastructure.

In contrast, the proposed developments identified in Section 3.1 would occur regardless of which alternative is selected. The North-South Road and Kapolei Parkway project would facilitate the development of DHHL homesteads and future development in East Kapolei, but would not induce secondary impacts separate from the previously planned development. The Ewa region, as previously discussed, has been planned as a Secondary Urban Center for Oahu, with the expansion of the City of Kapolei and area as the focal point of the development activity. Therefore, the Build Alternative would not induce additional development, because the proposed roadway construction has been anticipated and incorporated into the planning of other developments in the region.

3.16 PERMITS AND APPROVALS

Table 3.16-1 lists the approvals and permits that may be required to construct the Build Alternative, as well as those required for construction of the portion of Kapolei Parkway, from North-South Road to Renton Road, under the No-Build Alternative. As noted in Table 3.16-1, the processes to obtain some approvals are ongoing, and will be completed prior to completing the environmental review process. The City will obtain the permits required for construction of the proposed portion of Kapolei Parkway.
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<tr>
<th>AGENCY</th>
<th>PERMIT OR APPROVAL</th>
<th>NO-BUILD</th>
<th>BUILD</th>
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<tr>
<td><strong>Federal</strong></td>
<td></td>
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<td>Army Corps of Engineers</td>
<td>Clean Water Act (CWA) Section 404 Permit</td>
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<tr>
<td>Federal Highway Administration</td>
<td>Interstate Access Approval</td>
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<tr>
<td>Federal Highway Administration</td>
<td>Location Hydraulic Study</td>
<td></td>
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<tr>
<td>State Historic Preservation Officer</td>
<td>Section 106 of the National Historic Preservation Act (completed)</td>
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<td>Environmental Protection Agency, Region 9</td>
<td>Section 1424(e) Evaluation of the Safe Drinking Water Act (completed)</td>
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<tr>
<td>Federal Emergency Management Agency</td>
<td>Letter of Map Revision</td>
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<tr>
<td>National Resources Conservation Service</td>
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<td>X</td>
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<tr>
<td>U.S. Fish and Wildlife Service</td>
<td>Endangered Species Act Section 7 Consultation (completed)</td>
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<td>Department of Health</td>
<td>CWA Section 401 Water Quality Certification</td>
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<tr>
<td>Department of Health</td>
<td>National Pollutant Discharge Elimination System (NPDES) Permit for storm water discharges relating to construction activities</td>
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<td>Department of Health</td>
<td>Noise Permit (and noise variance if nighttime construction is anticipated)</td>
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<td>Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife</td>
<td>Habitat Conservation Plan and Certificate of Inclusion (completed)</td>
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<td>DLNR, Historic Preservation Division</td>
<td>HRS Chapter 6E-8 Review</td>
<td></td>
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<td><strong>City and County of Honolulu</strong></td>
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<td>Discharge of Waters Permit</td>
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<tr>
<td>Department of Transportation Services</td>
<td>Street Usage Permit</td>
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Notes: The permits and approvals listed in this column are only for construction of Kapolei Parkway from the proposed North-South Road to Rexton Road. Permitting requirements for other elements of the No-Build Alternative, such as the widening of Ford Weaver Road, are not provided.
CHAPTER 4
COMMENTS AND COORDINATION

This chapter summarizes public and agency consultation and coordination activities associated with this project that have been conducted to date. Project scoping and coordination activities included public information meetings; correspondence with government agencies, landowners, and environmental organizations; and meetings with government agencies and other interested parties. A summary of these activities is provided in this chapter. This chapter also provides a record of comments received during the comment period of the 1998 Draft EA for North-South Road.

4.1 PRE-CONSULTATION

4.1.2 AGENCY PRE-CONSULTATION

On October 2, 1995, a formal environmental scoping and project initiation meeting was held at Paki Hale in Honolulu, Hawaii. Agencies and organizations invited to and present at this meeting are listed on Table 4.1-1. During the meeting, participants identified the following key concerns:

- consistency of the project with the transit corridor to be dedicated along the section of North-South Road between the future Kapolei Parkway and Farrington Highway;
- control of stormwater runoff;
- preservation of the OR&L ROW, including its tracks; and
- impacts on the future UH-West Oahu Campus.

Meeting minutes of the project initiation meeting were prepared and are available for review at the HDOT Highways Division Planning Branch.

Following the environmental scoping/project initiation meeting, 17 agencies and organizations were solicited for further consultation and seven agencies responded with written comments (see Table 4.1-1). A summary of their comments is provided below, and copies of their letters are provided in Appendix A.

US Army Corps of Engineers (USACE)

USACE stated that Kaliu Gulch is not a "wetland", but is a "jurisdictional water of the U.S." A Department of Army (DA) permit may be required pursuant to Section 404 of the Clean Water Act if the gulch is subject to dredging or fill.

National Resources Conservation Service (NRCS)

NRCS provided information regarding Form AD 1006 (Farmland Conversion Impact Rating) pursuant to the Farmland Protection Policy Act.
### Table 4.1-1
Summary of Agency Pre-Consultation Activities

<table>
<thead>
<tr>
<th>Agency</th>
<th>Invited to Oct. 2&amp;3, 1995 Agency and Public Meetings</th>
<th>Attended Oct. 2, 1995 Scoping Meeting</th>
<th>Further Consultation Requested or Received*</th>
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<tr>
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<td>EPA</td>
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<td>Department of the Interior, Fish and Wildlife Service (USFWS)</td>
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<td>Department of Agriculture (USDA)</td>
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<td>BPNAS Redevelopment Commission</td>
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<td><strong>State of Hawaii</strong></td>
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<tr>
<td>Department of Accounting and General Services</td>
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<td>Facilities Planning and Management Office</td>
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<td>Water Resources Research Center</td>
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<tr>
<td><strong>City and County of Honolulu</strong></td>
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<td>Department of Land Utilization (now part of Department of Planning and Permitting)</td>
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<tr>
<td>Department of Parks and Recreation</td>
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### Table 4.1-1
Summary of Agency Pre-Consultation Activities (cont.)

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<th>Agency</th>
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<th>Further Consultation Requested or Received*</th>
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<td>Oahu Civil Defense Agency</td>
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<tr>
<td>Planning Department (now part of Department of Planning and Permitting)</td>
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<td><strong>Other Organizations</strong></td>
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<td></td>
</tr>
<tr>
<td>Oahu Metropolitan Planning Organization</td>
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<td></td>
</tr>
</tbody>
</table>

**Note:** *Includes letter correspondence and meetings.

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**U.S. Fish and Wildlife Service (USFWS)**

USFWS provided a list of threatened or endangered species that might be in the project area.

**State of Hawaii, Department of Hawaiian Home Lands (DHHL)**

DHHL informed the project sponsors that they are to acquire 200 acres of land adjacent to the project corridor.

**State Historic Preservation Division (SHPD)**

SHPD informed project sponsors that the OR&L ROW is listed on the National Register of Historic Places, and that any potential impacts to this historic property should be coordinated with the SHPD.

**Housing and Community Development Corporation of Hawaii (HCDCCH)**

HCDCCH informed project sponsors that they intend to realign the existing Kaloi Gulch as part of its planned East Kapolei project. (HCDCCH has dropped its East Kapolei development plans, including the realignment of Kaloi Gulch.)

**Honolulu Public Transit Authority (now DTS)**

DTS provided project sponsors with information about current bus routes that serve the project vicinity and stated that they are currently preparing a Transit Operations Analysis.

In addition to letter correspondence, seven pre-consultation meetings were held with the following agencies to discuss various aspects of the project, which are summarized below.
• City Department of Housing and Community Development (March 13, 1996) to discuss the Kapolei Parkway and North-South Road alignments near and within the Ewa Villages development;
• City Department of Public Works (March 13, 1996) to discuss re-alignment of Kalo Gulch;
• State Office of State Planning and Barbers Point Redevelopment Commission (March 14, 1996) to discuss general land use plans in the project vicinity, and realignment of Kalo Gulch
• Housing Finance and Development Corporation (March 28, 1996 and April 30, 1996) to discuss East Kapolei development plans, and realignment of Kaloi Gulch;
• Haseko Corporation (April 10, 1996) to discuss its Ewa Marina (now Ocean Pointe) development;
• PBR Hawaii (April 16, 1996) to discuss the North-South Road junction with Kapolei Parkway, and
• State Department of Transportation (June 27, 1996) to discuss the future bikeway between Waipahu Depot Road and Aliinui Drive using the ORL Right-of-Way.

Meeting minutes were prepared and are available for review at the HDOT - Highways Division, Planning Branch.

A second iteration of pre-consultation was not performed prior to issuance of this FEA/FONSI. The basis of this decision is as follows. Distribution of this FEA/FONSI to those filing for consulted party status in 1998 provides an opportunity for these parties to rejoin the discussion by commenting on this document. Any formal pre-consultation processes that were previously conducted have been incorporated into the current process. Where those comments were still applicable, this FEA/FONSI has incorporated the public comments on the 1998 Draft EA. In cases where the comments were no longer directly relevant, because project conditions have changed, effort was made to incorporate the spirit or intent of the comment.

4.1.2 PUBLIC INVOLVEMENT

4.1.2.1 PUBLIC INFORMATION MEETING

On October 3, 1995, a public information meeting was held at the James Campbell Building in Kapolei to present the project publicly and to solicit comments. The agencies identified in Table 4.1-1, and the following elected officials, community organizations, and affected parties were notified of the public meeting:

Elected Officials
• John DeSoto, City Council
• Rene Mansho, City Council
• Paul Oshiro, State House of Representatives
• Annelle Amaral, State House of Representatives
• Joseph Souki, State House of Representatives
• Brian Kanno, State Senate
• Norman Mizuguchi, State Senate

Community Organizations
• Ewa Neighborhood Board No. 23
• Hawaiian Railway Society
• Leeward Oahu Transportation Management Association
• Makakilo-Kapolei-Honokai Hale Neighborhood Board No. 34
• Villages of Kapolei Association

Environmental and Other Organizations
• American Lung Association of Hawaii
• GTE (now Verizon) Hawaiian Telephone Company
• Hawaii Audubon Society
• Hawaiian Electric Company, Inc.
• Hawaiian Historical Society
• Native Hawaiian Legal Corporation
• Oceanic Cable
• The Outdoor Circle
• Sierra Club Hawaii Chapter
• Teamsters Local 996
• Major Land Owners and Private Developers
• The Estate of James Campbell
• Gentry Hawaii, Ltd.
• Haseko Hawaii, Inc.
• Schuler Homes, Inc.

Notice of the public meeting was also published in Oahu’s two major newspapers, The Honolulu Advertiser and Honolulu Star-Bulletin, four weekdays prior to this meeting. Meeting minutes were prepared and are available for review at the HDOT - Highways Division - Planning Branch.

In summary, attendees identified the following key concerns:
• A North-South Road alignment closer to Fort Weaver Road would better serve Ewa Beach residents.
• The real traffic problem is east-west traffic, especially where the H-1 and H-2 Freeways intersect.
• Not all Ewa residents commute to Honolulu. Therefore, local east-west circulation must be improved, such as transportation between Ewa Beach/Ewa by Gentry and Kapolei.
• Easements should be dedicated for pedestrian walkways and bike paths.

4.1.2.2 OTHER COMMUNITY MEETINGS

In addition to the public meeting, project presentations were given during meetings of the Makakilo-Kapolei-Honokai Hale Neighborhood Board on October 17, 1995 and
August 21, 1997, and the Ewa Neighborhood Board on November 9, 1995 and July 10, 1997. The minutes of these meetings can be obtained through the City and County of Honolulu Neighborhood Commission Office or the chairpersons of these neighborhood boards. Additionally, the Ewa Beach Community Association was informed of the status of the North-South Road project on January 30, 1996. During both Ewa Neighborhood Board meetings the suggestion of a “straight alignment” was raised. In response to these suggestions, the “straight alignment alternative” was analyzed, but was dropped from further consideration. See Chapter 2 for additional information on alternatives considered.

4.1.2.3 PUBLIC COMMENTS ON THE HABITAT CONSERVATION PLAN

The publication of the draft Habitat Conservation Plan for Abutilon menziesii at Kapolei (HCP), discussed in Section 3.7, required a public hearing to be held by DLNR. Because HDOT took the lead in the preparation of the HCP, HDOT used this additional opportunity to receive any potential EA comments from the public. The public hearing was noticed in the Office of Environmental Quality Control (OEQC) publication, The Environmental Notice on December 23, 2003. Around the same time, HDOT independently distributed copies of the public hearing notice to approximately 40 community organizations and individuals, including elected officials. The meeting itself was held at Asing Park in Ewa on January 28, 2004. A court reporter has prepared a transcript of the public comments received at the public hearing.

Four individuals provided comments at the HCP public hearing. Three of the four individuals represented agencies in support of the HCP. These agencies were HDOT, the City, and DHHL. The City requested that its property be included in the Kapolei area defined by the draft HCP; this comment was addressed in the Final HCP (March 2004), and the City’s property is now included as part of the official HCP. One resident submitted comments objecting to the taking of Kulaaua plants and the proposed North-South Road alignment.

An additional 15 comment letters were received during the HCP public comment period, including those from elected officials, neighborhood representatives, and other residents, most of which expressed support for the HCP and plans to improve the traffic in the area. One comment letter made recommendations and asked questions about details of the HCP, which have since been addressed in the Final HCP.

The HCP was approved on April 8, 2004 by DLNR. Public comments on the draft HCP were considered or incorporated in the Final HCP and this FEI/FONSI. DLNR is not required to prepare response letters for comments received during the HCP public comment period, so no letters will be prepared to respond specifically to these comments. Records of comments received are available for review at the HDOT Highways Division Planning Branch.

4.1.2.4 Environmental Justice Public Outreach

The Executive Order 12898 on Environmental Justice (EJ), signed on February 11, 1994, requires each federal agency to take appropriate and necessary steps to identify and
avoid disproportionately high and adverse effects of federal projects on health or environment of minority and low income populations. As discussed in Section 3.4.3, Varona Village was identified as an ethnic minority and/or low-income population. Participation and input from residents in Varona Village was solicited in the form of door-to-door outreach activities held on the last week of July through the first week of August, 2004. During this outreach, many of the Varona Village residents were personally invited to attend the project’s public hearing (see Section 4.3.3). Information gathered during EJ outreach efforts is documented and addressed in Section 3.4.3.

4.2 REGULATORY COORDINATION

Since the project requires compliance with certain environmental laws and regulations, coordination and consultation with the following agencies and organizations were conducted. Prior to February 2004, coordination did not pertain to the Kapolei Parkway segment. However, after 2004, correspondence may pertain to either or both of the North-South and the Kapolei Parkway segment. Copies of letters are provided in Appendix A.

4.2.1 SECTION 404 OF THE CLEAN WATER ACT

This law prohibits the discharge of dredged materials into the waters of the U.S., which include non-navigable streams, wetlands and mudflats, unless USACE provides a permit. The Section 404 process for this project involved coordination and consultation with the USACE, and previously with HFDC (now HCDCH). The following consultation and coordination activities were conducted on behalf of the project, in addition to EA comment letters received from the USACE (see Section 4.3.2).

USACE
- February 27, 1996 letter from the DTS Director to the USACE District Engineer requesting information on whether Kaloi Gulch is a “waters of the U.S.”
- March 21, 1996 letter from the USACE Environmental Engineer to the DTS Director confirming that Kaloi Gulch is a “waters of the U.S.” subject to USACE jurisdiction
- HFDC (now HCDCH)
- October 22, 1996 letter from the HFDC Executive Director to the DTS Director informing that HFDC plans to re-align Kaloi Gulch (note that HCDCH no longer has these plans)

4.2.2 FARMLAND PROTECTION POLICY ACT (FFPA)

FFPA requires that federal agencies identify and consider the adverse effects of their actions on the preservation of farmland. The FFPA process involves coordination and consultation with NRCS. The following consultation and coordination activities were conducted with NRCS on behalf of the project.
• October 1, 1996 letter from Parsons Brinckerhoff (PB) to NRCS, requesting Land Evaluation Information as specified in Form AD-1006
• October 23, 1996 letter from NRCS to PB, providing a Form AD-1006 with Land Evaluation Information
• May 7, 2004 letter from PB to NRCS, describing recent project definition changes and requesting land evaluation information for Form NRCS-CPA-1006
• June 4, 2004 Form AD-1006 returned from NRCS, and later finalized by FHWA with an impact rating score of 149 points.

4.2.3 SECTION 1424(E) OF THE SAFE DRINKING WATER ACT

Section 1424(e) of the Safe Drinking Water Act allows EPA to prohibit federal funding for projects in areas that overlie a sole-source aquifer if the project threatens the aquifer. Southern Oahu Basal Aquifer (SOBA) is one of two sole source aquifers in Hawaii. For projects that trigger Section 1424(e) review, a water quality assessment must be prepared and be subject for EPA review. The following consultation and coordination activities were conducted with EPA, upon submittal of a water quality assessment.

• September 18, 1997 letter from EPA to FHWA approving the project pursuant to Section 1424(e) of the Safe Drinking Water Act.
• October 2, 1997 letter from FHWA to HDOT stating that EPA has approved the project pursuant to Section 1424(e) of the Safe Drinking Water Act.
• March 22, 2004 letter from PB to EPA, re-submitting the water quality assessment for review, and explaining changes to the project definition.
• April 19, 2004 letter from EPA to PB, determining that based on the Water Quality Assessment, it is unlikely that there would be a significant impact to the SOBA from this project.

4.2.4 SECTION 7 OF THE ENDANGERED SPECIES ACT (ESA) AND CHAPTER 195D, HRS

This law requires that actions that are federally funded, authorized or carried out be done in a manner so as to not jeopardize the continued existence of any plant or animal species listed as threatened or endangered, or destroy or adversely modify any designated critical habitat. The Section 7 process involves consultation with either the U.S. Fish and Wildlife Service (Service) or the National Marine Fisheries Service depending on the potentially affected species. Because no marine species are affected by this project, federal coordination occurred only with the USFWS. Corresponding State coordination occurred with DLNR's Department of Forestry and Wildlife (DOFAW). The following consultation and coordination activities were conducted on behalf of the project. Details of this coordination are also provided in Section 3.7 of this FEIS/FONSI.

U.S. Department of the Interior, Fish and Wildlife Service

• December 8, 1995 letter from PB to the Service, requesting a species list.
• February 1, 1996 letter from the Service to PB, identifying species historically known to exist in the project area: two endangered plants, and three Species of Concern, of which two are plants and one is an insect.
June 13, 1996 letter from the Service to PB, clarifying that the insect species in the February 1 letter is more common than previously believed and may not be native to Hawaii; there is no need to survey the project area for this species.

September 3, 1997 letter from HDOT to the Service, confirming species list coordination to date and reporting the finding of another federal trust species, *Abutilon menziesii* (Kooloaula). HDOT noted that other additional coordination will be necessary under the new circumstances.

October 1, 1997 informal Section 7 consultation meeting with USFWS, FHWA, HDOT, the City, PBR Hawaii, and PB; reviewed project history, botanical studies to date, proposed mitigation, the Biological Assessment (BA) to be submitted, and the Section 7 process.

October 10, 1997 letter from the Service to HDOT, stating that the endangered species and species of concern mentioned in previous correspondence “will not be subject to consultation”; requesting additional information about Kooloaula locations; and stating the need for a Biological Assessment.

May 6, 1998 meeting of the Service, FHWA, HDOT, City, PB, and PBR Hawaii to discuss Kooloaula.

October 9, 1998 letter from the Service to FHWA, following-up on May 6 meeting. The Service states the project is likely to adversely affect Kooloaula, and a BA is required per 50 CFR 402.12. The Service has not received the BA or any other correspondence from FHWA or PB.

January 26, 2004 formal Section 7 coordination meeting with the Service, FHWA, HDOT, DLNR-DOFAW, the City, and PB, to discuss recent changes in the project definition (inclusion of Kapolei Parkway), and procedures for formal consultation.

January 30, 2004 letter from PB to the Service, requesting re-coordination of the species list.

March 3, 2004 letter from the Service to PB, confirming that Kooloaula is the only federal trust species located within the proposed project footprint.

March 23, 2004 letter from FHWA to the Service, initiating formal Section 7 consultation for the North-South Road and Kapolei Parkway project.

April 22, 2004 letter from the Service to FHWA, acknowledging receipt of letter requesting initiation of formal Section 7 consultation and all required information.

August 5, 2005 letter from the Service to FHWA, providing the Service’s biological opinion that the proposed project is not likely to jeopardize the continued existence of the listed species, and that no critical habitat would be affected.

**State of Hawaii DLNR, DOFAW**

December 8, 1995 letter from PB to DLNR-DOFAW, requesting a species list.


1997 to 2004, multiple coordination telephone calls and meetings with DLNR-DOFAW and State of Hawaii, Endangered Species Recovery Committee (ESRC) on development of the HCP.
April 8, 2004 approval of HCP by Board of Land and Natural Resources.

4.2.5 SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA) AND SECTION 6E-8, HRS

NHPA requires that actions that are federally funded, authorized or carried out take into account the effect of such actions on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register of Historic Places (such resources are called historic properties). The Section 106 process involves coordination and consultation with the State Historic Preservation Officer, and other agencies and organizations that have an interest in or is mandated to protect historic properties. In addition, the Advisory Council on Historic Preservation is afforded the opportunity to comment on actions that may potentially affect historic properties. The corresponding State law is Section 6E-8, HRS, which places similar responsibilities on State agencies to evaluate their projects. Completion of the Section 106 process normally satisfies the requirements of HRS Section 6E-8. The following consultation and coordination activities were conducted on behalf of the project.

DLNR, SHPD

- February 27, 1996 letter from the City and County of Honolulu Department of Transportation Services (DTS) Director to the SHPD Administrator, initiating consultation, and to inform the SHPD about possible impacts to the OR&L ROW (note that the project has since been redefined such that the OR&L ROW is no longer within the project limits).
- March 8, 1996 letter from the SHPD Administrator to the DTS Director, providing information about the OR&L ROW.
- November 5, 1997 letter from FHWA to the SHPD Administrator, requesting concurrence on a "no effect" determination regarding the project (note that this determination is now synonymous with a "no historic properties affected" determination pursuant to the updated Section 106 regulations).
- January 21, 1998 letter from the SHPO to the FHWA, concurring with the "no effect" determination.
- February 4, 1998 letter from FHWA to HDOT, stating that SHPO has reviewed the project and concurred that the project will have "no effect" determination.
- March 15, 2004 meeting and site visit to the proposed Kapolei Parkway/Renton Road intersection with SHPD architectural historian.
- March 31, 2004 letter from FHWA to SHPD Administrator, defining changes to the proposed undertaking and APE, noting the initiation of consultation with SHPD staff and concern about traffic signals at the Kapolei Parkway/Renton Road intersection, and informing of intention to start consultation with other parties.
- April 21, 2004 letter from the SHPO to FHWA, recommending an "adverse effect" determination for the architectural concerns and a "no historic properties affected" determination for archaeological resources.
- May 7, 2004 letter from FHWA to SHPD, responding to their determination letter, and expressing the intent to continue work with SHPD staff on appropriate architectural treatments within the historic district.
• June 15, 2004 meeting to coordinate preparation of a Draft Memorandum of Agreement regarding architectural concerns in the historic district.

• July 16, 2004 meeting and site visit involving SHPO, HDOT, the City's Department of Design and Construction, and the project consultant to re-evaluate potential project impacts.

• August 20, 2004 letter from FHWA to SHPO, containing FHWA's effect determinations of "no historic properties affected" with regards to archaeology, and a "no adverse effect" determination with regards to the Ewa Villages Historic District.

• September 8, 2002 letter from SHPO to FHWA, concurring with the effect determinations in the August 20, 2004 letter.

Section 106 Consulted Parties

• May 7, 2004 letter from FHWA to the Office of Hawaiian Affairs (OHA) Administrator describing the proposed project and requesting comments on potential impacts to historic properties.

• May 7, 2004 letter from PB to "Section 106 Consultation List" (see Appendix A) describing the proposed project and requesting comments on potential impacts to historic properties.

• May 17, 2004 meeting involving PB and Ewa Hongwanji representatives on site to answer questions about roadway alignment and to hear concerns about their desire to use a portion of the Kapolei Parkway ROW below Renton Road as their parking area.

• June 1, 2004 letter from OHA to FHWA describing cultural significance of Ewa region and request that appropriate agencies be notified if Native Hawaiian remains or deposits are discovered.

• July 14, 2004 presentation before the Oahu Island Burial Council (OIBC). OIBC requested Section 106 consultation with five additional individuals (identified in Appendix A).

• July 21, 2004 letter from PB to "Section 106 Consultation List #2" (See Appendix A) describing the proposed project and requesting comments on potential impacts to historic properties.

4.2.6 EXECUTIVE ORDER 11988 ON FLOODPLAIN MANAGEMENT

The Executive Order on Floodplain Management (E.O. 11988) directs each Federal agency to "provide leadership and... take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." Similarly, FHWA's requirements pertaining to the analysis of floodplain impacts require public and agency involvement to assess a project's consistence with existing watershed and floodplain management programs (23 CFR 650.111 (f)), as described in Section 3.8.4. The following narrative and information is provided to describe agency coordination activities that have been conducted specific to this project's floodplain concerns, as well as selected coordination on regional floodplain concerns that have relevance to the project area.
The pre-consultation phase of the North-South Road Environmental Assessment began in 1995. The Director of the Department of Land and Natural Resources (DLNR) was consulted. The Director routed the pre-consultation documents to the Land Division for review. The reviewers included the State National Flood Insurance Program (NFIP) Coordinator.

In response to the federally declared flood emergency of 1996, funds for flood hazard mitigation were requested from FEMA. The Ewa Villages Hazard Mitigation Grant Application was submitted to the State NFIP Coordinator and FEMA in 1997 by the Department of Housing and Community Development.

The East Kapolei Master Plan Environmental Impact Statement was submitted to the Director of the DLNR for review. This master plan disclosed the regional drainage concept that was current at the time for the East Kapolei area. The Office of Environmental Quality Control publication date was 28 March 1997. No comments were received from DLNR, including the State NFIP Coordinator.

The original North-South Road Draft EA was submitted to the Director of the DLNR 1998. The draft EA was routed to the State NFIP Coordinator and no comments were received.

The Letter of Map Revision (LOMR) dated October 12, 2000 from FEMA to the City and County of Honolulu regarding the proposed revised flood elevation determinations for the Ewa Village Area was approved by FEMA and became effective on February 1, 2001. This letter is included in Appendix A.

A March 3, 2003 letter from FEMA to the City validates the approval of the Base Flood Elevations (BFEs) in the LOMR. The approved map is included in the Drainage Report (see Appendix J). FEMA approval extended flood hazard designations into areas not previously mapped. Correspondence demonstrating coordination of the LOMR with FEMA is included in Appendix A. Appendix A also includes correspondence with FEMA coordinating design flows in the area.

The Revised Draft EA was transmitted to DLNR and FEMA Oahu Office in July, 2004.

On August 17, 2004 a meeting was held with DOT, FHWA, and a representative of FEMA Region IX to discuss the North South Road flood hazard issues. It was determined that the proposed project is consistent with the City’s Flood Ordinance which meets the minimum requirements of the NFIP Regulations.

Meetings of the Kaloi Gulch Technical Committee have addressed the North South Road and Kapolei Parkway project, and the contribution of these projects to the regional drainage plan. The project is consistent with the criteria established by the Technical Committee.
4.3 DRAFT ENVIRONMENTAL ASSESSMENT

4.3.1 1998 DRAFT ENVIRONMENTAL ASSESSMENT

The Draft EA (September 1998) for the North-South Road Corridor project was announced in the December 23, 1998 edition of the Environmental Notice, which initiated the 30-day public comment period that ended on January 22, 1999. Copies of the Draft EA were mailed to federal, State and County agencies and elected officials who may have an interest in the project. All parties who were sent copies of the Draft EA were asked to provide comments.

The following agencies, organizations and individuals provided written comments on the 1998 Draft EA during its 30-day comment period:

Federal Agencies
- USACE
- USFWS

State of Hawaii Agencies
- BPNAS Redevelopment Commission
- Department of Education
- DHHL
- Department of Health
- DLNR, Land Division
- DLNR, State Historic Preservation Division
- Office of Environmental Quality Control
- Office of Hawaiian Affairs

City and County of Honolulu Agencies
- Board of Water Supply
- Department of Facility Maintenance
- Department of Planning and Permitting
- Fire Department
- Police Department

Businesses, Organizations and Individuals
- GTE Hawaiian Tel (now Verizon Hawaii)
- Haseko (Ewa), Inc.
- Hawaiian Electric Company, Inc.
- Hawaiian Railway Society
- Leeward Oahu Transportation Management Association
- Oamilda, Glenn J.
- Sierra Club, Hawaii Chapter
- West Oahu Soil and Water Conservation District
Copies of the 1998 Draft EA comment letters are provided in Appendix A. In general, the comments were very informative, and were used to help prepare this FEA/FONSI. The following is a brief summary of the EA comments:

- Support for the project
- Requested to consider other alternatives for the project
- Utilities constraints and coordination with agencies regarding future plans
- Traffic and circulation impacts and increased traffic
- Concerns regarding Biological Resources, particularly for the Abutilon menziesii
- Coordination with future land development, particularly schools, residential, and commercial uses
- Project impacts related to: Air quality impacts, Noise impacts, Visual impacts, Historic and Cultural Resources, and Secondary and Cumulative impacts
- Water Resource issues related to sheet flow, flooding, diversion of Kaloi Gulch, creating a detention basin, and run off
- Construction impacts related to: Air quality and Noise impacts

This FEA/FONSI incorporates the public comments on the 1998 EA as much as possible. If comments were no longer directly relevant because project conditions have changed, effort was made to address or incorporate the spirit or intent of the comment.

Due to the unusual circumstances surrounding this project's environmental review process, HDOT and FHWA chose to treat the 1998 Draft EA comments as pre-consultation for this FEA/FONSI because the North-South Road portion of the project remained similar to what was proposed in 1998. In addition, the 1998 Draft EA comments did not cause HDOT or FHWA to reconsider their previous preliminary determination that the project would not have a "significant impact" (see Chapter 5). Therefore, the decision was made to forego additional pre-consultation.

Since the 1998 Draft EA comment letters are now considered pre-consultation, formal responses to each and every substantive comment were not provided to the commenter. However, the comments have been addressed in this FEA/FONSI, and all agencies, organizations and individuals who provided comments to the 1998 Draft EA received a copy of this FEA/FONSI, in addition to receiving a letter acknowledging their previous comments made in 1998 (see Appendix A).

4.3.2 2004 ENVIRONMENTAL ASSESSMENT

The EA process that began in 1998 was in part delayed by anticipated impacts to an endangered plant species, the Kooloaaula (Abutilon menziesii). Changes being made to the State's endangered species law at the time resulted in complications of coordination between the State law and the federal ESA Section 7 process. In addition, the 1998 Draft EA had assumed a major land development proposal by the HFDC (now HCDCH), East Kapolei, would surround most of the North-South Road. Due to changing economic and financial conditions, HCDCH has since abandoned the East Kapolei proposal. These two factors resulted in substantial delay to HDOT and FHWA's ability to complete
the State and federal environmental review processes for the North-South Road project in a timely manner.

In July 2004, HDOT and the City and County of Honolulu prepared a Revised Draft EA pursuant to Chapter 343, HRS. The Revised Draft EA, with a revised project action, was noticed on July 23, 2004 in the Office of Environmental Quality Control’s publication, The Environmental Notice, starting the 30-day public comment period. Copies of the Revised Draft EA were mailed to federal, State and County agencies and elected officials who may have an interest in the project. All parties who were sent copies of the Revised Draft EA were asked to provide comments. The public comment period was later extended to September 16, 2004 to provide sufficient time for the public to comment after the September 1, 2004 public hearing (see Section 4.3.3).

4.3.3 PUBLIC HEARING

HDOT and DTS held a public hearing on the July Revised Draft EA, pursuant to Chapter 343, HRS, on September 1, 2004 at Asing Park in Ewa. The public hearing was organized and advertised in conformance with all applicable State and County requirements, including HDOT Guidelines for Public Participation. Advance legal notices of the hearing and a notice extending the public comment period to September 16, 2004, were published on August 19 and 25 in the Star Bulletin. An article in the Star Bulletin published on August 21, 2004, announced the September 1, 2004 public hearing. Direct mail notices were sent to 290 people and organizations on the project mailing list, including those who had received the Revised Draft EA and those contacted during community outreach efforts conducted in Varona Village. Varona Village residents contacted during a focused outreach were notified and encouraged to attend the public hearing (see Section 3.4.3).

The public hearing was attended by a total of 42 people, of which ten were from Varona Villages. The first hour of the public hearing consisted of an open house format where project boards were displayed and project personnel were available for explanation and questions about the project. The formal portion of the public hearing consisted of a brief project description and public testimony. The public was informed that three methods of providing testimony were available at the public hearing: verbal comments before the audience; verbal comments to a court reporter in another room; and written comments using a comment form provided. In addition, the public was encouraged to send written comments to HDOT by the extended comment period of September 16, 2004.

4.3.4 COMMENTS

A total of 51 agencies, elected officials, businesses, organizations, and individuals provided comments on the Revised Draft EA through letters, written comment forms, and oral testimony made at the project’s public hearing. The following agencies, organizations, and individuals provided written and/or oral comments on the EA during the public comment period:
Federal Agencies
- Federal Aviation Administration (FAA)
- FEMA
- NRCS
- U.S. Navy
- USACE

State of Hawaii Agencies
- Department of Accounting and General Services
- Department of Defense
- Department of Education
- Department of Health
- Department of Health, Solid and Hazardous Waste Branch
- Department of Human Services
- DHHL
- DLNR
- DLNR, CWRM
- DLNR, DOFAW
- DLNR, SHPD
- Oahu District Land Office
- Office of Environmental Quality Control
- Office of Hawaiian Affairs
- University of Hawaii at Manoa
- University of Hawaii at Manoa, Office of Capital Improvements

City and County of Honolulu Agencies
- Board of Water Supply
- Department of Community Services
- Department of Facility Maintenance
- Department of Parks and Recreation
- Department of Planning and Permitting
- Fire Department
- Police Department

Elected Officials, Businesses, Organizations and Individuals
(The asterisks indicate those who gave their comments through oral testimony, which are provided in the public hearing transcript (See Section 4.3.3 and Appendix A))
- Apec, Todd*
- Briones, Will
- Becker, Tony*
- Dudley, Kioni*
- Ewa by Gentry Community Association
- Garst Seed Co.
- The Gas Company
- Halverson, Lyle*

September 2004
• Hange, Patrick
• Hawaiian Railway Society
• Hildebrand, Carolyn
• Interagency Coordination Councils Organization*
• Ko Olina Development, LLC
• Lee, Philmund*
• Leeward Oahu Transportation Management Association
• Lynn, Coby*
• Maria, Louis*
• Malama, Tesha*
• Malate, Cres*
• Mark Moses, State Representative*
• Oamilda, Glenn J.*
• Tagovaloa-Amoat*
• Willie C. Espero, State Senate

Comments and concerns that were expressed were instrumental in preparing this FEA/FONSI. The written comments received during the Revised Draft EA comment period included the following:

• Support for the project
• Permit information and potentially applicable regulations regarding floodplain management, NPDES, and Section 401 Water Quality Certification
• Utilities and coordination with agencies regarding existing land use, and future development, particularly schools and the future UH West Oahu Campus
• Concerns regarding traffic and existing congestion induced by growth in the area
• Construction and operational impacts related to: Air quality impacts, Noise Impacts, Historic and Cultural Resources, Secondary and Cumulative impacts, Open Space Preservation, and Community Safety
• Water Resource issues related to flooding
• Farmland access during various project phases
• Project design and landscaping
• Solid waste management during project demolition, construction, and operation

General comments expressed during public testimony included concern that Kapolei Parkway would isolate Varona Village from the rest of Ewa Villages; support for the survival of the endangered Koolaua including the possible use of the plan in roadway landscaping; and the need for traffic signalization on Kapolei Parkway outside the project limits. Also, an alternative alignment and project modifications were suggested.

Appendix A contains copies of comment letters and corresponding response letters, as well as a summary of comments received at or in conjunction with the public hearing, along with corresponding responses. Transcripts of the hearing are also included in Appendix A.
CHAPTER 5
FINDING OF NO SIGNIFICANT IMPACT

5.1 DETERMINATION

The proposed project would not significantly alter the environment in either the long- or short-term. Through design features, consistency with regional master plans and committed mitigation measures described in Chapter 3, project impacts would be below significance thresholds as established by Chapter 343, Hawaii Revised Statutes (HRS).

Absent new information indicating that the project would generate a significant environmental impact, the State of Hawaii Department Transportation (HDOT), in coordination with the City and County of Honolulu Department of Transportation Services (DTS), anticipates preparing a Final Environmental Assessment (EA) addressing comments on this Revised Draft EA, and formally stating that the project will have no significant environmental impacts. The Final EA would thus include a Finding of No Significant Impact (FONSI), issued under State requirements. Therefore, the need to prepare a State Environmental Impact Statement (EIS) is not anticipated.

The Federal Highway Administration (FHWA) also needs to issue a federal document satisfying the requirements of the National Environmental Policy Act (NEPA). The current plan is for the Final EA to also serve as the NEPA EA. The FHWA may determine whether a federal FONSI is appropriate no sooner than 30 days after issuance of the NEPA EA. The significance criteria for a NEPA EA are different from the significance criteria for a State EA.

State and federal FONSI determinations would conclude the environmental review processes under the NEPA and Chapter 343, HRS. Environmental and construction-related permits and approvals listed in Section 3.15 would subsequently need to be obtained.

5.2 FINDINGS AND REASONS

In accordance with Chapter 343 and Hawaii Administrative Rules (HAR), Sections 11-200-9 and 11-200-11.2, HDOT, in coordination with the DTS, anticipates issuing a FONSI for the proposed project. This anticipated FONSI will be announced in the State’s Environmental Notice along with an announcement of the availability of this Draft EA. This assessment is based on an evaluation of project impacts in relation to the "Significance Criteria" specified in HAR 11-200-12 (b). The definition of "significant effect" in Chapter 343 was amended by the 2000 State Legislature to include "... or adversely affect the economic [or] welfare, social welfare [...], or cultural practices of the community and State."

Below are the preliminary findings of this Draft EA, subject to the public and agency review comments that may be filed during the comment period. The Significance
Criteria appear below in italics, followed by a brief discussion of the project in relation to the specific criterion. The nature of the project’s potential impacts, and committed mitigation measures to minimize adverse impacts, is discussed in detail in Chapter 3.

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resource** – The proposed project would not involve an irrevocable commitment to loss or destruction of any natural or cultural resources. The project would convert land once used for sugarcane cultivation to a roadway. This land is currently being used for agriculture; however, the farmers have signed short-term land leases with the knowledge that the land will be converted to urban uses in the future. City and County of Honolulu (City) policy has slated the City of Kapolei and the Ewa Development Plan area for continued urbanization.

The roadway would be near the Ewa Sugar Plantation Villages (Ewa Villages) Historic District, a resource listed on the State Register and nominated for the National Register of Historic Places. Because of early coordination, the FHWA anticipates that the roadway would result in an “adverse effect” on this site in accordance with Section 106 of the National Historic Preservation Act. This determination may result from traffic signals that are likely to be warranted at the intersection of Kapolei Parkway and Renton Road. These traffic signals would be the first erected within the District, and thus have the potential to be inconsistent or affect adversely the visual integrity of the Historic District. The State Historic Preservation Officer (SHPO) is expected to concur with this “adverse effect” finding, should it be issued.

Presently, however, FHWA has not issued its formal “adverse effect” determination. Coordination among HDOT, FHWA and the SHPO is continuing, and there is a possibility that FHWA will determine that the traffic signal would not have an “adverse effect” on the Historic District.

Should an “adverse effect” determination be formally issued, Kapolei Parkway was planned in concert with the establishment of the Historic District. Further, a Memorandum of Agreement (MOA) would be processed stipulating subsequent review of the traffic signal design by the SHPO. The intent of the subsequent review is to minimize the visual intrusion of the traffic signal, consistent with applicable standards and requirements for traffic signals. Consequently, the visual impact of the traffic signal will be minimized.

The project would not affect the Oahu Railway & Land Company (OR&L) right-of-way (ROW).

A Habitat Conservation Plan (HCP) for the Koolaua (Abutilon menziesii) was approved by the State of Hawaii Board of Land and Natural Resources on April 8, 2004. The HCP is designed to result in a net gain for this endangered species despite the construction of the proposed project and future developments planned for the area.
2. Curtails the beneficial uses of the environment – The proposed project would not curtail the beneficial uses of the environment. The existing land use is mostly vacant with short-term agricultural use. However, the land surrounding the proposed North-South Road is planned for urban uses by City policy, and the proposed project is consistent with these plans.

3. Conflicts with the State’s long-term environmental policies or goals and guidelines expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders – The proposed project would not conflict with the State’s long-term environmental policies. The Build Alternative is consistent with the policies and guidelines specified in HRS Chapter 343, as demonstrated by the discussion in this chapter and Chapter 3.

4. Substantially affects the economic or social welfare of the community or State – The proposed project would not substantially affect the economic or social welfare of the community or State. Existing nearby agricultural activity would be minimally affected, but only a small portion of the land under cultivation would be required for additional roadway ROW. With only a small amount of land removed from use by tenant farmers, the continuation of existing farming activities would not be jeopardized until such time as the land is urbanized. In addition, mitigation measures would be implemented to minimize impacts on the farming of adjacent land, such as reconstruction of agricultural infrastructure and maintenance of access to fields (see Chapter 3).

Per Executive Order 12898 on “Environmental Justice (EJ)”, and the requirements of Title VI, the proposed project would not negatively or disproportionately affect any one racial or economic group or segment any existing neighborhood. Nearby communities would benefit from an improved transportation network and creation of short-term construction jobs.

Consultation with the residents of Varona Village, an EJ target population, will occur during the review period of this Draft EA, so these people will have full opportunity to participate in the planning process.

5. Substantially affects public health – The proposed project would not substantially affect public health. Potential risks to public health from roadway projects can be caused by unsafe highway conditions, degradation of air and water quality, and high traffic noise levels. However, the proposed project would not cause any of these health risks for the following reasons:

- North-South Road and its interchange with the H-1 Freeway, and the section of Kapolei Parkway addressed by this document, would be designed using procedures and standards of the American Association of State Highway and Transportation Officials, ensuring roadway safety;
- Carbon monoxide modeling indicates that the Build Alternative would not cause an exceedance of State or National Ambient Air Quality Standards;
- Mitigation measures would be implemented to prevent possible contamination of the Southern Oahu Basal Aquifer;
The locations where traffic noise impacts are predicted to approach FHWA Noise Abatement Criteria or substantially exceed existing noise levels are located in vacant areas. These areas are planned to be developed in the future. Therefore, the developer(s) would mitigate potential noise impacts before constructing noise sensitive uses, such as housing; and

- Standard construction-related activities and impacts (air and water quality, noise, traffic) would occur away from residential areas. Best Management Practices, dust control, and traffic control measures would be implemented.

6. Involves substantial secondary impacts – The proposed project would not involve substantial secondary impacts. Urban developments are being proposed in areas adjacent to North-South Road and Kapolei Parkway, and are anticipated to occur regardless of the construction of North-South Road. Therefore, the proposed project would not induce secondary land uses and related secondary impacts that would not otherwise occur. Rather, this project represents good planning practice by providing necessary infrastructure in an area designated for urban development.

7. Involves substantial degradation of environmental quality – The proposed project would not involve substantial degradation of environmental quality. The study area is comprised of land formerly used for sugarcane cultivation, and the land is planned for conversion to urban use. Therefore, the proposed project would not degrade environmental quality.

8. Substantially affects a rare, threatened, or endangered species, or its habitat – The proposed project would affect endangered Koolaula. However, a Habitat Conservation Plan (HCP) was approved by the Board of Land and Natural Resources. While removal of the plants from their native habitat constitutes an adverse effect, the implementation of the HCP is expected to result in a net gain for the endangered species.

9. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions – The impacts of the proposed action as described throughout Chapter 3 will not cumulatively have a considerable effect on the environment, in particular because the Ewa region is designated as the “second city” of Oahu. Development of the Ewa region consists of relatively substantial residential, governmental, business, and educational developments that have been built, are under construction, or are planned or approved by the State and City. Projects planned for areas abutting North-South Road and Kapolei Parkway would be completed regardless of completion of the proposed project. However, due to planned developments in Ewa, a number of transportation improvements must be implemented, such as North-South Road and Kapolei Parkway, to address existing traffic congestion and future travel demand. For instance, North-South Road would be consistent with regional land use plans, and help improve sub-regional mobility by providing an alternative to Fort Barrett and Fort Weaver Roads. In addition, North-South Road is a complete project, with logical termini, and will not cause
or automatically require the need for other roadway projects by the State and City.

10. Detrimentally affects air or water quality or ambient noise levels – The proposed project would not substantially affect air or water quality or ambient noise levels. The proposed project would comply with State of Hawaii, City and County of Honolulu and federal environmental regulations and standards. The proposed project would cause no violations of State or National Ambient Air Quality Standards. Noise levels would not substantially increase from existing levels in areas where noise-sensitive land uses presently exist. Mitigation measures would be implemented to prevent possible contamination of the Southern Oahu Basal Aquifer.

11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters – The proposed project is not likely to be damaged as a result of being located in the following environmentally-sensitive areas: Special Management Area, Shoreline Setback, floodplain, tsunami inundation area, geologically hazardous area, estuary, and coastal and submarine areas. There are very few environmentally sensitive areas within the project limits, apart from the colony of endangered plants.

Although the project area is presently prone to flooding, North-South Road and Kapolei Parkway will not contribute to the problem, and would provide drainage improvements to mitigate the increase in impervious surface created by the project.

The project will provide for sufficient handling of runoff increases as well as offer improved levels of flood and storm water quality control within this portion of the watershed. Added flood control capacity provided by the project's drainage channel and drainage basin will enable the containment of the FEMA regulatory flood. The retention basin will provide sufficient mitigation to offset runoff increases from the project.

Erosion and sediment transport controls such as the use of a sediment retention storage basin, the use of mild slopes to minimize entrainment of sediments and the use of vegetative linings in the basin and channel area are being designed into the drainage plan.

Additionally, roadway drainage plans are based on the framework of the East Kapolei Drainage Master Plan to conform with adjacent area developments.

12. Substantially affects scenic vistas and viewplanes identified in county or state plans or studies – The proposed project would not affect scenic vistas and viewplanes identified in City and County of Honolulu or State plans or studies. The project area is not a designated scenic vista. The proposed project would not block or significantly affect any existing scenic views.
13. Requires substantial energy consumption – The Build Alternative would result in similar levels of overall vehicle miles traveled as the No-Build condition. Therefore, the Build Alternative would generate a similar level of vehicle fuel consumption as the No Build Alternative. Some energy would be required for construction and nighttime roadway lighting; however, it is not considered significant.

Following the State-mandated 30-day public comment period on this Revised Draft EA, HDOT, in coordination with the DTS, has considered all comments received, and determines that a FONSI determination is appropriate.
CHAPTER 6 -

NORTH-SOUTH ROAD and KAPOLEI PARKWAY
FINAL ENVIRONMENTAL ASSESSMENT
CHAPTER 6
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APPENDICES
APPENDIX A

AGENCY AND PUBLIC CORRESPONDENCE

This appendix includes: pre-consultation coordination; various regulatory consultation; 1998 Draft Environmental Assessment comments; Transcript of September 2004 Public Hearing; and comments and responses on the July 2004 Revised Draft EA.
PRE-CONSULTATION COORDINATION

and

REGULATORY CONSULTATION
Mr. Kali Watson  
Page 2  
February 27, 1996

2.  **Anteisol roadway** — This alternative includes an interchange on H-1 and has the following characteristics:
   - Roadway with terminus at H-1 and Ewa Marina
   - Three operational sub-alternatives that include:
     - All general purpose (GP) lanes;
     - GP lanes plus high-occupancy vehicle lanes;
     - GP lanes plus a busway utilizing the width provided by a 50-foot transit easement running parallel to the roadway easement.

For the next few months we will be conducting traffic, environmental, and financial analyses for the MIS. We are therefore requesting input from your department to assist us in completing the MIS. Information such as the status of your agency’s development plans would be very helpful.

Please call Mr. Gregory Higa at 527-6893 if you have any questions or require additional information. Your assistance in this matter will be greatly appreciated.

Respectfully,

[Signature]

Charles O. Swanson  
Director

Enclosure: Project location map
MEMORANDUM

TO: HOWARD K. TAKARA, ACTING EXECUTIVE DIRECTOR
    HONOLULU PUBLIC TRANSIT AUTHORITY

FROM: CHARLES O. SWANSON, DIRECTOR

SUBJECT: NORTH-SOUTH ROAD CORRIDOR PROJECT, EWA, OAHU, HAWAII

Thank you for your agency's participation in the North-South Road Corridor project. As mentioned at the agency initiative/scoping meeting held on October 2, 1995, we will complete a major investment study (MIS) prior to the preparation of a NEPA/HRS Chapter 343 environmental document.

Based on the consensus of the participants at this agency meeting and a public meeting held on the next day at the James Campbell Building, we selected the following alternatives to be studied in the MIS:

1. No Build — This alternative includes future widening of Fort Weaver Road and Farrington Highway, and future improvements to Kualoa, Makakilo, and Palahai Interchange. It does not assume an interchange on H-1 at North-South Road. The sections of North-South Road through Ewa Villages, Ewa Gentry, and Ewa Marina would be completed, and would connect with Kapolei Parkway at the western end of Ewa Villages.

2. Transportation Systems Management (TSM) — This alternative has not been completely defined. It would probably include TSM measures on Fort Weaver Road and regional Travel Demand Management strategies.
3. Arterial Roadway — This alternative includes an interchange on H-1 and has the following characteristics:
   - Roadway with termini at H-1 and Ewa Marina
   - Three operational sub-alternatives that include:
     - All general purpose (GP) lanes;
     - GP lanes plus high-occupancy vehicle lanes;
     - GP lanes plus a busway utilizing the width provided by a 50-foot transit easement running parallel to the road-way easement.

For the next few months, we will be conducting traffic, environmental, and financial analyses for the MIS. We are therefore requesting input from the HPTA in completing the MIS. Information such as HPTA’s future plans for the Ewa region would be valuable input. Mr. James Burke, from your staff, was at the agency meeting that as a user of this future facility, HPTA would want to review travel forecasts and the design concepts to ensure that the improvements would accommodate buses. This will be kept in mind as we progress with the development of the project.

Please call Mr. Gregory Lee at 527-6803 if you have any questions or require additional information.

Enclosure: Project location map

CHARLES O. SWANSON
MEMORANDUM

TO:  CHARLES O. SWANSON, DIRECTOR
      DEPARTMENT OF TRANSPORTATION SERVICES

FROM:  HOWARD K. TAKARA, ACTING EXECUTIVE DIRECTOR
      HONOLULU PUBLIC TRANSIT AUTHORITY

SUBJECT:  NORTH-SOUTH ROAD CORRIDOR PROJECT, EWA, OAHU, HAWAII

We are in receipt of your memorandum dated February 27, 1996, highlighting the agency meeting and public meeting regarding the North-South Road Corridor Project.

We have attached all current route/schedule maps that affect the area in question for your information. As you may be aware, we are currently conducting community workshops to gather data/information for our Transit Operations Analysis (TOA) study. Part of our goal for TOA is to prepare a Leeward/Central area circulation plan and develop a TRAMM and Thatano-Van service integration plan, therefore, the TOA results are provided. Future planning efforts for the Ewa, Oahu area will also be provided as they arise.

We look forward to working with you in evaluating travel forecasts and design concepts in the early stages of the MIS. This planning effort will benefit the transit riders in the Ewa community by ensuring the most efficient transit system possible.

Please call James Burke at Local 4445 if you have any questions.

Howard K. Takara

Attachments

Lieutenant Colonel Ralph Graves
District Engineer
U. S. Army Corps of Engineers
Pacific Ocean Division
Department of the Army
Building 230
Fort Shafter, Hawaii 96858

Dear Lieutenant Colonel Graves:

Subject:  North-South Road Corridor Project, Ewa, Oahu

A new north-south arterial roadway is being proposed in Ewa, Oahu, between Interstate H-1 and the proposed Ewa Marina project located on the southern coast of Ewa. A location map showing the project area is enclosed for your use.

As part of this project, we will complete a major investment study (MIS) prior to the preparation of a NEPA/HRS Chapter 343 environmental document. Both the MIS and the environmental document will require identification of potential wetland areas. We, therefore, request that the U. S. Army Corps of Engineers determine whether Kalihi Gulch, located adjacent to the proposed roadway, is a wetland and if so, the extent of the wetland. Another map showing the location of the gulch is enclosed.

It is our understanding that there are plans to relocate and improve the gulch associated with land use developments in the region. These land use development plans, not directly related to the North-South Road project, provide an easement between H-1 and Ewa Villages that includes space for a relocated Kalihi Gulch. We would also appreciate any input you may have regarding these plans to relocate Kalihi Gulch.
DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT HONOLULU
STAFF Dump Wahiawa, Hawaii
March 21, 1996

Operations Branch

Subject: North-South Road Corridor Project, Oahu, Hawaii

Mr. Charles O. Swanson
Director
City and County of Honolulu
Department of Transportation Services
Pacific Park Plaza
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Mr. Swanson:

This letter is in regard to your January 27, 1996, letter requesting that the U.S. Army Corps of Engineers determine whether Kaloi Gulch, located adjacent to the proposed roadway, is a wetland, and if so, the extent of the wetland. The U.S. Geological Survey topographic map for the area shows that an intermittent stream runs through Kaloi Gulch. Our office generally takes jurisdiction over intermittent streams as waters of the U.S. Under Section 404 of the Clean Water Act, a Department of Army (DA) permit is required for the placement of dredged or fill material into all waters of the U.S. Kaloi Gulch is not a "wetland," but is a jurisdictional water of the U.S.

You also requested our input regarding plans to relocate and improve Kaloi Gulch associated with land use developments in the region. The Corps generally comments on environmental review actions that might be associated with master plans and other development proposals. We recommend that you review these documents for our specific comments.

If you have any questions, please feel free to contact Mr. Alan Everson at 3H-9238, extension 11. Please refer to File Number 960000129 in future correspondence.

Sincerely,

[Signature]
Kathleen A. Dady
Environmental Engineer
October 22, 1996

The Honorable Charles Swanson, Director
Department of Transportation Services
City and County of Honolulu
711 Kapaelani Boulevard, 12th Floor
Honolulu, Hawaii 96813

Dear Mr. Swanson:

Subject: Kaloli Gulch Realignment, 1100 Acre State Land Bank, Kapolei, Oahu

This letter is to advise you that the Housing Finance and Development Corporation (HFDC) intends to realign the existing Kaloli Gulch drainageway from its present location west of the planned North/South Road Corridor to the 98.5° drainage easement within and along the east side of the 700 North/South Road Corridor.

Commencement and completion of the work is intended by HFDC to be accomplished prior to the construction of the North/South Road by the State Department of Transportation. As of this date, the work is in the conceptual master planning process by the planning engineer, R.H. Towill Corporation.

The work as described is subject to approval of the Commission on Water Resource Management, approval of plans and specifications by the City Department of Public Works, and issuance by HFDC of Special Revenue Bonds for financing of the project. Periodic updates of the progress of this capital improvement project may be forwarded to your department at the earliest dates they are made available if you so desire.

If there are any questions, please call me at 587-0640, or Stephen Thomas, Project Manager, at 587-0541.

Sincerely,

Roy S. Oshiro
Executive Director
The Honorable Cheryl D. Soon, Director
April 14, 1997
Page 2

- Kaloa Gulch - HFDC intends to begin the infrastructure development of East Kapele with the re-alignment of the Kaloa Gulch to the east side of the North-South Road corridor. Construction is anticipated to begin in early 1998. The excavated material from the gulch re-alignment will serve as the sub-base embankment for the Northouth Road Corridor.

You have my personal assurance that HFDC will make every effort as this progresses to faithfully coordinate and assist your department as well as the State Department of Transportation in expediting this most important project.

If there are any questions or other issues which require our immediate attention, please call Stephen Thomas, Project Manager at 587-0541.

Sincerely,

Roy S. Oshiro
Executive Director

C: Honorable Kau Hayashi, Director
State of Hawaii Department of Transportation
October 1, 1956

Saleu Nakama
Natural Resources Conservation Service
P.O. Box 50004
Honolulu H 96850

Dear Mr. Nakama

We spoke several months ago about a farmland conversion impact rating for North South Road. A corridor has been proposed and is shown on the enclosed soil map. Site A and Site B on the Alternative Site Rating Calendar are for a road with a 110 ft right of way and a 100 ft. right of way to include a boulevard. There are a number of designs for the interchange but they all are in approximately the same location.

We would appreciate if you could fill out the Land Evaluation Information on the enclosed form. If you have any questions, please call me at 548-2271.

Sincerely,

[Signature]

Jan Reichardt
Ms. Jan Rechelderfer
Pursh Building
Pacific Tower, Suite 3000
1001 Bishop Street
Honolulu, Hawaii 96813

October 23, 1996

Dear Ms. Rechelderfer:

Subject: Farmland Conversion Impact Rating - North-South Road Corridor, Ewa, Oahu, Hawaii

Enclosed is the Farmland Conversion Impact Rating (Form AD-1006) for the North-South Road Corridor. We completed Parts II, IV, and V.

If you have any questions, please call me at 541-3414.

Sincerely,

Yours sincerely,

Saku Nakamura
Soil Scientist

Enclosure

cc: (w/e excl.)
Michael Bajing, District Conservationist, USDA-NRCS, Ala Field Office, Ala, HI
May 7, 2004

Mr. Christopher Smith
Soil Scientist
Natural Resources Conservation Service
U.S. Department of Agriculture
P.O. Box 56004
Honolulu, HI 96823

Subject: North-South Road Corridor and Kapolei Parkway, Ewa, Oahu, Hawaii
Farmland Protection Policy Act, FarmNRCS-CPA-106

Dear Mr. Smith,

Pursuant to the Farmland Protection Policy Act and in behalf of the State of Hawaii, Department of Transportation (HDOT), we request Farmland Conversion Impact Ratings for this project. A partially completed Farmland Conversion Impact Rating form (NRCS-CPA-106) is attached.

The above referenced project was initially introduced to the National Resources Conservation Service (NRCS) in 1996 when a previous request was made for Farmland Conversion Impact Ratings. At that time, this project was called the North-South Road Project. The project definition and name has since been revised to include a portion of Kapolei Parkway contiguous with North-South Road. A Draft Environmental Assessment was published in September 1998. This project studied for several years, mainly due to the discovery of an endangered plant and changes in land development plans.

The HDOT, in consultation with the City and County of Honolulu (City) and Federal Highway Administration (FHWA), now propose to implement the North-South Road in conjunction with a portion of Kapolei Parkway. North-South Road would be a limited-access, principal arterial highway, connecting the transstate Route H-1 (H-1 Freeway) to Kapolei Parkway, and will be used to service and Federal funds for its construction. The construction of Kapolei Parkway between the North-South Road and Rincon Road intersections will be funded by both the City and Federal governments. The segment of Kapolei Parkway from North-South Road to Rincon Road has a right-of-way of approximately 116 feet and a length of approximately 0.7 mile, as shown on the enclosed project location map. The proposed project also includes the following elements:

- a new H-1 Freeway interchange to provide access to and from North-South Road,
- major intersections for North-South Road and Kapolei Parkway, and
- drainage features consisting of a drainage channel parallel to North-South Road, and a detention basin.

All project elements will be constructed in the roadway right-of-way. The enclosed Project Location Map shows the locations of the proposed project elements.

Since both the State and City actions will be seeking Federal funding assistance, these will be treated as one project for environmental assessment purposes pursuant to the National Environmental Policy Act (NEPA).

Pursuant to the Farmland Protection Policy Act, we request Farmland Conversion Impact Ratings for the current project alternatives. A partially completed Farmland Conversion Impact Rating form (NRCS-CPA-106) is attached.

Corridor A on the Alternative Site Rating Column is for North-South Road between Interstates H-1 Freeway and Kapolei Parkway plus the segment of Kapolei Parkway between North-South Road and Rincon Road. Corridor B would require approximately 217 acres of land zoned for agricultural use.

The right-of-way footprints of both North-South Road and Kapolei Parkway are shown on the enclosed soils map. Final engineering may vary slightly, but all features will be in the configuration shown.

We would appreciate your cooperation in completing Parts II, IV, and V of Form NRCS-CPA-106. If you have any questions, please feel free to contact me at (808) 586-2015 or ditton@agworld.com.

Sincerely,

Nami Ditton
Parete Brencherhoff Onda & Douglas, Inc.

Enclosures: 1. Form NRCS-CPA-106
2. Project location map with alternatives
3. Soils map

cc: Mr. Nathan Nagam, State Department of Transportation (w attachments)
Mr. Faith Meleheho, City and County of Honolulu, DTS (w attachments)
Mr. Pat Pang, Federal Highway Administration (w attachments)
# FARMLAND CONVERSION IMPACT RATING

**PART I** (To be completed by Federal Agency)  
**Site Of Land Evaluation/Review**  
**Date** 7/1/84  
**Federal Agency**  
**Address**  

**PART II** (To be completed by the Transportation Project)  
**Site Address**  
**Date**  

**PART III** (To be completed by Federal Agency)  
**Site Address**  
**Date**  

**PART IV** (To be completed by Federal Agency)  
**Site Address**  
**Date**  

**PART V** (To be completed by Federal Agency)  
**Site Address**  
**Date**  

**PART VI** (To be completed by Federal Agency)  
**Site Address**  
**Date**  

**PART VII** (To be completed by Federal Agency)  
**Site Address**  
**Date**  

**TOTAL FARM ASSESSMENT POINTS**  

---

**Site A** has been selected as the preferred alternative because it is consistent with the proposed roadway alignment, which is included in the "Environmental Impact Statement" and other related environmental documents that guide long-term land use and development in the area. The consistency with local plans is confirmed by the low-land impact rating for site A as the preferred alternative.
Mr. Phung
Transportation Engineer
Federal Highway Administration
300 Ala Moana Blvd., Room 2202
Honolulu, HI 96810

Re: North-South Road, City and County of Honolulu, Hawaii

Dear Mr. Phung:

I have reviewed the information you submitted regarding the North-South Road located in City and County of Honolulu, Hawaii and within the Southern Oahu Basin Safe Source Aquifer. Under provisions of the Safe Drinking Water Act, Section 1424(e), EPA is charged with review of projects that receive federal financial assistance and are located in Safe Source Aquifer areas. This program is designed by Congress to ensure that projects receiving federal financial assistance are constructed to prevent contamination of drinking water resources.

After reviewing the Draft Water Quality Assessment and proposed mitigation measures, it appears unlikely that this project will significantly impact the SOBA Safe Source Aquifer, especially if prevention activities are implemented at the H-1 interchange. Therefore, under provisions of the Safe Drinking Water Act, Section 1424(e), we approve this project.

If you have additional questions or require further information, please contact me at 415-744-1351.

Sincerely,

Wendy L. Melgin
Regional Hydrologist

Mr. Kazu Hayashida
Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Attn.: Nelson Sagum

Dear Mr. Hayashida:

Subject: North-South Road, City & County of Honolulu, Hawaii
Section 1424(e) Review, Safe Drinking Water Act

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Water Quality Assessment and the proposed mitigation measures for the subject project. In accordance with the Safe Drinking Water Act, Section 1424(e), the EPA has approved this project. Enclosed is the approval letter from the EPA.

Please contact me at 541-2536 if there are any questions.

Sincerely yours,

Pat V. Phung
P.E.
Transportation Engineer

Enclosure
March 22, 2001

Shaukat M. Fazal
US. Army Corps of Engrs
Bechtel
San Francisco, CA 94110

To: North South Rd. South of 101
Re: Tunnel Road Environmental Impact Statement

Dear Mr. Fazal:

As we have discussed on the phone, we are in the process of reviewing North South Road in the vicinity of Tunnel Road. A Federal Environmental Assessment was published to September 1999. The project stalled initially due to an unplanned landfill and changes in federal development plans.

For the current project the State of Hawaii Department of Transportation (HIDOT) proposes to build North South Road between Tunnel Road and Kapahulu Avenue, which would connect the existing 10-lane freeway to Kapahulu Avenue. In addition, the City of Honolulu proposes to build a portion of Kapahulu Avenue between the intersection with North South Road and Kapiolani Boulevard. Both the State and City actions are federalized, and will be treated as one project for environmental compliance purposes pursuant to the National Environmental Policy Act (NEPA). The proposed project includes the following elements:

- construction of a new 10-lane freeway interchange to provide access to and from North South Road
- associated intersections for North South Road and Kapahulu Avenue
- drainage facilities consisting of drainage channels parallel to North South Road, and a detention basin

All project elements will be constructed in the median strip only. Attachment 1 shows the locations of the proposed project elements. The beginning of construction for North South Road is planned for late 2001 with completion in 2003.

As with the previous project, the drainage system proposed for the median section of North South Road and its intersections with Kapahulu Avenue would collect and convey roadway drainage and incidentally spills along the roadway to a discharge to Kapiolani Park approximately 100 feet north of Kapahulu Avenue. The drainage point would be south of the project boundary, and therefore would be located above sump.

Thank you for your attention.

Sincerely,

[Signature]

Jan Rezabek
Geological Environmental Planner

Please note that one of the major changes from the previous EA is that the Tunnel Road Transportation Improvement Project (TRIP) is no longer proposed to volumate and embank. This is favorable.

We are now reviewing the Draft EA. Please provide any comments the Water quality Impacts we referred to EPA, and the corresponding on EPA’s approved.

Please contact me with any questions about the project. We would appreciate an updated approval letter to include in our Revised Draft EA.

[Signature]
April 19, 2000

Jon Reichelderfer  
Geologist/Lead Environmental Planner  
Fvtrmn Bnrkststoff  
1960 Bishop Street, Suite 3000  
Honolulu, HI 96813

Re: North South Road, Southend Oahu Aquifer (SOBA),  
Safe Drinking Water Act Amendments (4424e) Review

Dear Ms. Reichelderfer:

Thank you for resubmitting the North South Road Project for review under the Sole Source Aquifer program. Based on the Water Quality Assessment that you provided, it appears unlikely that there will be significant impacts to the SOBA from this project, especially if mitigation measures (e.g., draining stormwater runoff and spills away from the SOBA) are implemented at the H-1 interchange and during construction (e.g., not locating the construction staging area above the SOBA).

If you have any questions, please contact me at (415) 972-3355.

Sincerely,

[Signature]

Shawn Fitzgerald  
Environmental Scientist  
Ground Water Office
December 8, 1995

Brooks Harper, Field Supervisor
Ecology Services
Fish & Wildlife Service
P.O. Box 50167
Honolulu, HI 96850

Subject: North-South Road Project

Dear Mr. Harper:

Parsons Brinckerhoff has been selected as the engineering and environmental consultant for the North-South Road Project and we ask your assistance in our environmental assessment.

We request that the Fish and Wildlife Service identify the listed and proposed to be listed threatened and endangered species in the vicinity of the proposed corridor. A location map showing the project area is attached for your use.

Please do not hesitate to call me at 566-3271 if you have any questions or need more information.

Yours sincerely,
Parsons Brinckerhoff Quade & Douglas, Inc.

Jan Reichelderfer
Environmental Planner

Attachment: North-South Road Corridor Location Map

cc: Gregory Hsu, DTS
    Farish Miyamoto, DTS

Over a Century of
Engineering Excellence

December 8, 1995

Michael Buck
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl
Honolulu, HI 96813

Subject: North-South Road Project

Dear Mr. Buck:

Parsons Brinckerhoff has been selected as the engineering and environmental consultant for the North-South Road Project and we ask your assistance in our environmental assessment.

We request that the Division of Forestry and Wildlife identify the listed and proposed to be listed threatened and endangered species in the vicinity of the proposed corridor. A location map showing the project area is attached for your use.

Please do not hesitate to call me at 566-3271 if you have any questions or need more information.

Yours sincerely,
Parsons Brinckerhoff Quade & Douglas, Inc.

Jan Reichelderfer
Environmental Planner

Attachment: North-South Road Corridor Location Map

cc: Gregory Hsu, DTS
    Farish Miyamoto, DTS

Over a Century of
Engineering Excellence
United States Department of the Interior
FISHER AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOREGION
300 ALA MIKANA BOULEVARD, ROOM 310A
HONOLULU, HAWAII 96818
PHONE: (808) 541-3441 FAX: (808) 541-3478

In Reply Refer To: TR

Jan Reichelderfer, Environmental Planner
Parsons Brinkerhoff Quade & Douglas, Inc
Pacific Tower, Suite 2000
1001 Bishop St.
Honolulu, HI 96813

Dear Ms. Reichelderfer:

On December 12, 1995, the U.S. Fish and Wildlife Service (Service) received your December 6, 1995 letter requesting identification of the proposed and listed threatened and endangered species in the vicinity of the proposed corridor for the North-South Road Project. We regret that our reply was delayed due to the recent Federal Firefighter

The Service has reviewed the map provided with your request and pertinent information in our files, including maps prepared by the Hawaii Heritage Program of the Nature Conservancy. Although the proposed project area has been extensively modified by agricultural and development activities, there are historical records of the following Federal Trust Species in the vicinity of the proposed corridor:

Plants
Cordyline schiedeana (Listed Endangered)
Mesiliana niloula (Habitat Endangered)

There are also historical records of Species of Concern (formerly known as Candidacy 2 Species). While these species are not currently federally protected, they may be added to the Endangered Species List in the future. Species of Concern are currently in the vicinity of the project area include two species of plants, Pisonia odorata and Pisonia rubra (Extinct) and one insect, Pseudonemia ochracea.

We appreciate your concern for endangered species and would like the opportunity to review the Draft Environmental Assessment for this project. If you have any questions, please contact our Branch Chief for Endangered Species, Ms. Margo Stall, or Fish and Wildlife Biologist Tanya Rubenstein at 808-541-3441 (fax 808-541-3470).

Sincerely,

Brooks Harper
Field Supervisor
Ecological Services

JAN 4 1996

Jan Reichelderfer, Environmental Planner
Parsons Brinkerhoff Quade & Douglas, Inc
Pacific Tower, Suite 3000
1001 Bishop St.
Honolulu, HI 96813

Dear Ms. Reichelderfer:

This letter is in response to your phone call of June 10, 1995, requesting further information on a beetle known as Pseudonemia ochracea. In our letter dated January 1, 1996, the U.S. Fish and Wildlife Service (Service) noted that historical records of this species were known from the vicinity of the proposed corridor for the North-South Road Project. Our letter identified this species as a Species of Concern (formerly known as a Candidacy 2) to the Service.

We would like to take this opportunity to clarify our policy on Species of Concern. The term "Species of Concern" describes species that are of concern to the Service, but require further biological research and field study to resolve their conservation status. These species are not currently federally protected, and the Service is no longer officially maintaining a list of these species.

While some species considered Species of Concern may be quite rare, the Service believes that Pseudonemia ochracea is more common than previously believed and may not even be native to the Hawaiian Islands. Consequently, the Service is not reviewing the status of this insect for possible listing. There is no need to survey the project area for this insect as part of the environmental review process.

We appreciate your concern for endangered species. If you have any further questions, please contact our Branch Chief for Endangered Species, Ms. Margo Stall, or Fish and Wildlife Biologist Tanya Rubenstein at 808-541-3441 (fax 808-541-3470).

Sincerely,

Brooks Harper
Field Supervisor
Ecological Services
Mr. Brooks Harper  
U. S. Fish and Wildlife Service  
Department of the Interior  
300 Ala Moana Boulevard, Room 3108  
Honolulu, Hawaii 96813

Attention: Ms. Maryo Stahl

Dear Mr. Harper:

Subject: North-South Road Corridor Study

As you are aware, Koʻolauʻula (Abutilon menziesii), which is a listed endangered species, has been found on property in Ewa that is to be developed by the Housing Finance and Development Corporation (HFDC) and this department. Our departments and the Federal Highway Administration are planning to develop the North-South Road on a portion of the property. It is our understanding that HFDC has been coordinating with your agency, through the State Department of Land and Natural Resources, Forestry and Wildlife Division, and is also representing us in this matter.

As the subject project intends to use federal funds for its construction, coordination in accordance with Section 7 of the Endangered Species Act is required prior to completion of the environmental assessment (EA). We anticipate completion of the draft EA by early November. Therefore, we are concerned that all proper steps are being taken to obtain this clearance in a timely manner.

Your letter of February 1, 1996, issued in response to the environmental scoping process for the subject project, identified the following federal trust species which may be present in the project vicinity:

1. Centaurea asperula (listed Endangered),
2. Marsilea villosa (listed Endangered),
3. Fornicaria villosa (species of concern),
4. Tocoumum oblongum (species of concern), and
5. Ferrisianum obtusum (species of concern).

Since your letter, detailed botanical surveys have been conducted along the alignment of the proposed road and in adjacent areas. We understand that HFDC has shared the results of these surveys with you. The botanical survey conducted for the subject project is included. In summary, no population of federal trust species (1), (2), (3), or (4) were encountered. With respect to federal trust species (5), your June 13, 1996 letter states that "there is no need to survey the project area for this taxon as part of the environmental review process."

However, another federal trust species, Abutilon menziesii, was encountered. Populations were found in the alignment of the proposed federal-aid highway and in property to be developed by HFDC. The attached map shows the areas where the plants were found.

Under these circumstances, we will be contacting you to arrange a meeting to discuss the following issues:

1. Receiving documentation from you that no further work is necessary regarding federal trust species (3) through (5), and
2. Any additional requirements that must be completed with for Abutilon menziesii.

In consideration of the coordination that has already occurred on the mitigation plan for Abutilon menziesii, we look forward to expeditious completion of the Section 7 coordination process for the subject project.

Should you have any questions regarding this matter, please call Ken Au at 587-1543.

Very truly yours,

Kazuo Hayashida  
Director of Transportation

Enclosures: (1) Project Location Map  
(2) Char & Associates, Botanical Subconsultants, Botanical Survey North-South Road Corridor Study, Ewa District, Island of Oahu, June 1996  

/bc: GLC DTS
United States Department of the Interior
FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOREGION
200 ALA WAIANA BOULEVARD, ROOM 3184
BO.SE.0088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

In Reply To: LTG

Kane Hayashida
Deputy Director, Federal Highway Administration
State of Hawaii
Department of Transportation
800 Punchbowl Street
Honolulu, HI 96813-3097

Re: Informal Consultation Under Section 7 of the Endangered Species Act on the Development of the North-South Road, Ewa, Oahu, Hawaii.

Dear Mr. Hayashida:

The map enclosed with the above mentioned letter was not consistent with the map included in the Proposal for a Highway Conservation Plan for Abalone Monica in the East Kapolei Master Plan Project, which we are currently reviewing. Further clarification is required concerning the locations of the petitioned or threatened species colonies in association with the North-South Road project.

The North-South Road project is considered a major construction activity. Therefore, a Biological Assessment (BA) is required as per 50 CFR part 402.12 (enclosed). A BA evaluates the impacts of the project on all listed species (i.e., Abalonet monicae), proposed species, and critical habitats that may be present in the action area and proposes measures to mitigate for these impacts.

A site visit will be arranged to identify the colonies of Abalonet monicae impacted by the North-South Road project and to discuss the project and potential mitigation measures.

We appreciate your concern for endangered species and we look forward to conducting a site visit and reviewing the Biological Assessment and the Draft Environmental Assessment for the project. If you have any further questions, please contact our Program Leader for Endangered Species, Marge Sull, or Fish and Wildlife Biologist Linda Gibson at 808/541-3441 (fax: 808/541-3470).

Sincerely,

Donald A. Holsa
Field Supervisor
Ecological Services

enclosure
co: FHWA, Honolulu
DTS, Honolulu
Parsons Brinckerhoff, Honolulu
Re: Consultation Under Section 7 of the Endangered Species Act on the Development of the North-South Road, Ewa, Oahu, Hawaii

Dear Mr. Wang:

This follows up our May 6, 1998, meeting with representatives from FBR Hawaii, Parsons Brinckerhoff (the consultant representing the Hawaii Department of Transportation (DOT) and the Federal Highway Administration (FHWA)), DOT, and the City and County Department of Transportation Services concerning the proposed North-South Road in Ewa, Oahu, Hawaii. During the meeting, we discussed the section 7 consultation requirements under the Endangered Species Act for the proposed project.

The North-South Road project is considered a major construction activity that is likely to adversely affect a federally listed endangered species of plant, Charles's meadowfoam. Therefore, a Biological Assessment (BA) is required as per 50 CFR 402.12. A BA evaluates the impacts (i.e., direct and indirect) of the project on all listed species (e.g., Charles's meadowfoam), proposed species, and critical habitat that may be present in the action area and proposes measures to mitigate for these impacts.

At the May 6 meeting, Parsons Brinckerhoff stated that the Service should receive the BA by June 1998. We have not received the BA or any further correspondence from your agency or from Parsons Brinckerhoff on this matter. Please let us know if you have any questions about the section 7 consultation process or if there is anything further we can do to assist you in preparation of the required BA.

Sincerely,

[Signature]

Robert P. Smith
Pacific Islands Manager

cc: DOT, Honolulu
Parsons Brinckerhoff, Honolulu
January 30, 2004

Ms. Gino Shultz
Acting Field Supervisor
Pacific Islands Office
U.S. Fish and Wildlife Service
380 Aki Maiwaa Boulevard, Room 3-122
Honolulu, Hawaii 96815

Attn: Margot Zuli

Dear Ms. Shultz:

Subject: North-South Road and Kapolei Parkway Project, Ewa, Oahu, Hawaii - Re: Coordination of Species List under Section 7, Endangered Species Act

The Federal Highway Administration (FHWA), in cooperation with the State of Hawaii Department of Transportation and the City and County of Honolulu, proposes to construct the North-South Road and Kapolei Parkway Project. As the project consultant, we are writing to request that the Service establish a species list to identify the species listed as of February 1, 1996, as required by the Endangered Species Act. This project was previously introduced to the U.S. Fish and Wildlife Service (Service) in 1995.

At that time, this project was called the North South Road Project. The project definition and map was then revised to include a portion of Kapolei Parkway contiguous with North-South Road. A map indicating the location and footprint of the proposed project is attached.

A brief history is provided below:

Part Section 7 Coordination with the Service

In a letter dated February 1, 1996, and addressed to Parson Berthelemy, the Service stated that the following listed species may occur in the proposed project area for North-South Road:

- Ctenium subumbonatum (listed Endangered)
- Machilus waialua (listed Endangered)
- Paliacris viridissima (Species of Concern)
- Torenia axillaris subsp. axillaris (Species of Concern, very possibly extinct)
- Besseya stainesii (Species of Concern)

Furthermore, the Service concluded that the proposed project did not affect any of the plants identified by the Service. (Chir. October 1997).

In a letter dated October 16, 1997, the Service stated that the four aforementioned plant species "will not be subject to consultation" because biological surveys did not find these species in the project area.

In a letter dated June 13, 1999, the Service stated that the Paliacris viridissima, a type of beetle, is more common in areas previously burned and may not even be native to the Hanaua Islands. The Service recommended that no surveys for this beetle be performed in the project area during the environmental review process.

Abalon marina

Subsequent to the February 1996 letter from the Service, the endangered plant Abalon marina, commonly known as Koolaua or red fern, was discovered during a study for a development project adjacent to the proposed North-South Road (Nagawa 1999). Subsequent surveys also confirmed and identified the locations of known Koolaua plants. The plants discovered in this region are collectively referred to as the Koolaua population of A. marina.

In accordance with our coordination with the Service, we believe that no threatened or endangered species or critical habitat, other than A. marina, are found in the project area. We request that the Service reissue the previous species list described above, adding A. marina, and advise us if any additional research or coordination will be required for species other than A. marina.

If you have questions or require additional information, please contact me at (808) 588-2238 or email at dzileno@fhwa.dot.gov.

Sincerely yours,

[Signature]

Tane Upton
Environmental Planner

Enclosures

Word Map

cc:
- Margot Zuli, USFWS
- Pat Fagre, FHWA
- Paul Evans, DHNR-DOEM
- Richard Nagawa, DOH
- Pam Haymon, CEC Honolulu
- Yuwe Choo
January 30, 2004
Ms. Gina Shultz
Acting Field Supervisor
Pacific Islands Office
U.S. Fish and Wildlife Service
300 Na Hauu Boulevard, Room 3-122
Box 50595
Honolulu, Hawaii 96850

Attn: Mangala Zolt

Subject: North-South Road and Kapolei Parkway Project, Ewa, Oahu, Hawaii
Re: Coordination of Species List under Section 7, Endangered Species Act

The Federal Highway Administration (FHWA), in cooperation with the State of Hawaii Department of Transportation and the City and County of Honolulu, proposes to construct the North-South Road and Kapolei Parkway Project. As the project consultant, we are writing to request that the Service re-issue a species list to update the previous species list dated February 1, 1995, in order to comply with the requirements of Section 7 of the Endangered Species Act.

This project was previously introduced to the U.S. Fish and Wildlife Service (Service) in 1995. At that time, this project was called the North-South Road project. The project definition and name has since been revised to include a portion of Kapolei Parkway contiguous with North-South Road. A map indicating the location and footprint of the proposed project is attached.

A brief history is provided below:

First Section 7 Correspondence with the Service

In a letter dated February 1, 1995, and addressed to Paramount Engineering, the Service stated that the following listed species may occur in the proposed project area for North-South Road Plants:

- Conittrum arborescens (listed Endangered)
- Mesembryanthemum muticum (Vincetoxicum)
- Averrhoa vitifolia (Species of Concern)
- Albizia julibrissin var. macrostigma (Species of Concern, very possibly extinct) listed
- Pimentum vaccinium (Species of Concern)

A botanical survey conducted for the proposed project did not find any of the plants identified by the Service. (Oahu, October 1997.) In a letter dated October 10, 1997, the Service stated that the four aforementioned plant species "will not be subject to consultation" because botanical surveys did not find these species in the project area.

In a letter dated June 13, 1996, the Service stated that the Pimentum vaccinum, a type of beautea, is more common that previously believed and may not even be natives to the Hawaiian Islands. The Service recommended that no surveys for this beautea be performed in the project area during the environmental review process.

Abiotic factors

Subsequent to the February 1996 letter from the Service, the endangered plant Alstonia mucronata, commonly known as Koelefa or red flax, was discovered during a study for a development project adjacent to the proposed North-South Road (Wapiti 1996). Subsequent surveys also confirmed and identified the locations of known Koelefa plants. The plants discovered in this region are collectively referred to as the Koelefa population of A. mucronata.

As evidenced in past correspondence with the Service, we believe that no threatened or endangered species or critical habitat, other than A. mucronata, are found in the project area.

We request that the Service re-issue the previous species list described above, adding A. mucronata, and advise us if any additional research or coordination will be required for species other than A. mucronata.

If you have questions or require additional information, please contact me at (808) 566-2235 or email at oiamau@fws.gov.

Sincerely yours,

Tina Ohtomo
Environmental Planner

Exhibits:
- V1

Enclosures:
- Ms. Gina Shultz
- U.S. Fish and Wildlife Service
- North-South Road Project
- P. Miller, FHWA
- M. Paul Casey, DWA-HDFWA
- M. Michael, DWA-HDFWA
- P. Loxton, DWA-HDFWA
- P. Loxton, DWA-HDFWA
- Ms. Elena G. Ohtomo

Over a Century of Engineering Excellence
United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Island Fish and Wildlife Office
Mile 3, Hana Highway
Hana, Maui 96713

Mr. Nana Otsuru
Parson Bunch, Miller & Douglas, Inc.
1001 Bishop Street, Suite 3000
Honolulu, Hawaii 96813

Re: Request for Updated Threatened and Endangered Species List for the Proposed North-South Road and Kapolei Parkway Project, Ewa, Oahu, Hawaii

Dear Mr. Otsuru:

The U.S. Fish and Wildlife Service has reviewed the information provided in your letter dated January 28, 2003, and approved by the Service on February 7, 2003, requesting a updated list of all threatened and endangered species that may be present within the proposed project site. The Federal Highway Administration, in cooperation with the State of Hawaii Department of Transportation and the City and County of Honolulu, is proposing to construct a North-South Road and Kapolei Parkway Project in Kapolei, Oahu. This project has a long history and we have been in communication several times over the last few years to address the potential adverse effects to federally listed species pursuant to the Endangered Species Act of 1973, as amended.

To update species information within the proposed project area, we have reviewed the information you provided including recent surveys conducted by Waimana Ching and Associates. We also reviewed pertinent information in our files including maps prepared by the Hawaii Natural Heritage Program. We have determined only one endangered plant species, Abacaha noveirita, is located within the proposed project footprint. In addition, we have determined that there are no species protected for listing or proposed or designated critical habitat within the project area.

We appreciate your efforts to conserve endangered species. If you have any questions, please contact Ms. Robinta Zeller, Botanist, phone: (808) 792-9100, fax: (808) 792-9510.

Sincerely,

[Signature]

Gita Shults
Acting Field Supervisor

Ms. Nana Otsuru

cc:
Mr. Pat Flagg, Federal Highway Administration
Mr. Paul Canning, Division of Land and Natural Resources Department of Forestry and Wildlife
Mr. Nelson Sayem, Hawaii Department of Transportation
Mr. Faith Miyamoto, City and County of Honolulu
Ms. Yvonne Obuse
March 23, 2004

Ms. Gina Schulte

Acting Field Supervisor
U.S. Fish and Wildlife Service
Box 2088
350 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96813

Attention: Ms. Marigold Zoll

Dear Ms. Schulte:

Subject: Intention of Endangered Species Act Section 7 Fossil Consultation for North-South Road and Kapolei Parkway Project Ewa, Oahu, Hawaii

Thank you for your March 2, 2004, species coordination letter addressed to project consultant Parsons Brinckerhoff, confirming that A. nonomus is the only listed plant species within the proposed project footprint.

Due to the anticipated adverse impact of these federal-aid highway projects on the A. nonomus, the Federal Highway Administration (FHWA) is writing to initiate formal Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to the Endangered Species Act. The subject species of the formal consultation is the endangered plant Kokoalani, or red flaxma flower (nonomus).

This letter transmits to the Service a biological assessment (BA) pursuant to the requirements of 50 CFR 402.13(b). The BA comprises the State's Habitat Conservation Plan (HCP) for endemic vegetation in Kapolei. This HCP was prepared pursuant to Hawaii Revised Statutes, Chapter 191 and reflects input received from the Service during the State's HCP process, as well as comments from the State's six-person Endangered Species Recovery Committee (ESRC), in which the Service is represented. The draft HCP was released for public review by the State's Board of Land and Natural Resources (BLNR) on December 31, 2003, and a public hearing was held on January 28, 2004. Public comments were received and relevant comments were incorporated into a subsequent version of the HCP, which was recommended for approval by the ESRC on March 12, 2004. Based on ESRC comments on March 12, another revision of the HCP has been produced, and is enclosed with this letter. Approval of the HCP by the BLNR is anticipated in April 2004, completing the HCP review process.

The ESRC recommends that the BA describes developments proposed on 1,400 acres of State property and about 23 acres of City and County of Honolulu property in Kapolei (collectively called the "Kapolei property"). These developments include the proposed North-South Road and Kapolei Parkway. The BA describes the impact of the development actions on the Kapolei population of A. nonomus, and provides mitigation strategies that would result in a net gain of A. nonomus.

Project Description

The State of Hawaii Department of Transportation (HDOOT) proposes to build North-South Road, a limited access, principal arterial roadway, which would connect the Interstate H-1 Freeway in Kapolei, the proposed interchange for North-South Road, and Kapolei Parkway. In addition, the City and County of Honolulu (City) proposes to build a portion of Kapolei Parkway between the intersections with North-South Road and Hoomaluhia Road. Both the State and City actions are federal-aid, and will be treated as one project for environmental clearance pursuant to the National Environmental Policy Act (NEPA).

The proposed project also includes the following elements:

- Construction of a new H-1 Freeway interchange to provide access to and from North-South Road,
- Associated improvements for North-South Road and Kapolei Parkway; and
- Drainage features consisting of a transition channel parallel to North-South Road, and a detention basin.

All project elements will be constructed in the roadway right-of-way. The enclosed map shows the location of the proposed project elements.

North-South Road would bypass the Kapolei property, and address multiple transportation needs. It would improve the existing transportation network within the area by acting as a relief route to both Fontaine and Fort Bontem Park Roads, thereby reducing traffic congestion in the region. By providing alternative travel routes, the proposed project will improve mobility within the Ewa region. The project would also provide access for development planned in Ewa by other parties. The beginning of construction for North-South Road is planned for late 2004, with completion in 2009.

Forest Impacts and Proposed Mitigation

Botanical surveys of the Kapolei property, including the North-South Road and Kapolei Parkway footprints, have been conducted by Kenneth Higanto (1996) and Chin & Associates (1996, 1997, 2005). A monocort was the only federally listed species found during these surveys. Their report is included as an Appendix to the BA.

The plants discovered on the State and City properties are collectively referred to as the Kapolei population of A. nonomus. The plants occur in five clusters (Clusters A, B, C, D, and E) in the central and southern portions of the Kapolei property. Figure 6 of the BA shows the location of these clusters.
Specific project impacts would consist of removing plants presently located in the proposed project area. Clusters C and F plants directly affected by the proposed project would be transplanted to selected alternative sites, and their genetic material would be preserved at off-site facilities, as elaborated in the BA. Some of these actions have already occurred under the Interior Management Plan and are addressed in the BA.

The BA proposes a program that would help ensure the protection and recovery of the species, including the following:

- The BA proposes active monitoring and management of the Kópolis population to protect its genetic diversity.
- BA implementation and active management period would be approximately 20 years and would be tied to the accomplishment of measurable goals, including the successful establishment of three "wild" offshore populations. The BA also proposes long-term management of the Kópolis population beyond the 20-year period. The funding strategy for this plan is under development.
- The BA establishes an annual 8-acre "conservation reserve area" (CRA) which would allow a portion of the Kópolis population to remain undisturbed and protected until at least one of the wild transplants sites has achieved the long-term success criteria defined in the BA.

The successful implementation of the BA would significantly increase the number of new plants on Curaçao as well as improve their quality compared to the in situ disturbed covefield conditions in the Kópolis property.

Note that other, subsequent development projects in the area are anticipated to result in the eventual removal of all plants in the Kópolis population in the course of 20 years. Therefore, the BA also addresses issues on other portions of the Kópolis property and establishes a "certificate of inclusion" procedure by which other developers may contribute to a "consensus fund" to help the preservation and recovery efforts for the Kópolis. Please refer to the BA for more detailed information.

The BPA has determined that the mitigation measures summarized above and elaborated in the BA would reduce the potential for adverse impacts on the Kópolis to negligible levels. The BPA therefore believes that the proposed project would not contribute to the continued existence or recovery of the listed species.

Based on the information provided, we request that the Service accept the BA and initiate Endangered Species Section 7 consultations for the proposed project. To advance the planning process for this project, we would appreciate receiving an advance copy of the draft Biological Opinion at your earliest convenience.
United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
200 Ala Moana Boulevard, Room 3-132, Box 20006
Honolulu, Hawaii 96850

Mr. Pat V. Young
Federal Highway Administration
Box 5026
200 Ala Moana Boulevard, Room 3-136
Honolulu, Hawaii 96805

To: HEC-HI, Request to Issue Section 7 Consultation on Proposed North-South Road and Kapahulu Parkway Construction Project (L-3-2-2004-P-133)

Dear Mr. Young:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) March 24, 2004, receipt of your March 23, 2004, letter requesting initiation of formal section 7 consultation under the Endangered Species Act. The consultation concerns the possible effects of your proposed North-South Road and Kapahulu Parkway construction project on the endangered plant, Abutilon menziesii (Koolau, or red jatropha).

All information required of you to initiate consultation was either included with your letter or is otherwise available for our consideration and reference. We have assigned it number L-3-2-2004-P-133 to this consultation. Please refer to that number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). Therefore, we expect to provide you with our biological opinion no later than August 5, 2004.

As a reminder, the Endangered Species Act requires that after initiation of formal consultation, the Federal agency may not make any irreversible or irremediable commitment of resources that limit future options. This practice ensures agency actions do not prejudice the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

Sincerely,

R. Mark Sandberg
Acting Field Supervisor
Dear Mr. Phung:

This biological opinion responds to your request for formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). Your request was dated March 23, 2004, and was received on March 24, 2004.

The statutory deadline for completing this consultation is August 5, 2004. At time of the impacts that the proposed construction of the North South Road and Kapolei Parkway may have on the endangered plant species Abutilon menziesii. This species occurs on lands owned by the Estate of James Campbell, the State of Hawaii (University of Hawaii at West Oahu, Department of Hawaiian Home Lands, Department of Land and Natural Resources Land Division), and the City and County of Honolulu, on the island of Oahu.

The biological opinion was prepared using the following information: 1) the State’s 2004 Habitat Conservation Plan (HCP) for Abutilon menziesii at Kapolei; 2) the Hawaii Natural Heritage Program 2004 database; 3) information from one site; and, 4) notes from the January 26, 2004, and February 13 and 26, 2004, meetings and associated follow-up correspondence between the Federal Highway Administration (FHWA) and the Service. A complete administrative record of this consultation is on file in the Pacific Islands Fish and Wildlife Office (PIFWO).

Conservation History

The Administrative record regarding the proposed construction of the North South Road and Kapolei Parkway dates back to 1995. At that time, FHWA and the Hawaii Housing and Community Development Corporation of Hawaii (HHCDCH) requested the Service identify any federally protected species in the vicinity of the proposed centerline for the North South Road and a proposed housing development in Kapolei. From 1995 to 1999, efforts to identify the species and the impacts were made. In 1999, a proposed housing development in Kapolei was identified. Since then, the proposed project has been revised and is currently in the consultation process.

In detail, the consultation with FHWA was conducted on January 11, 2004, and 11 representative of the U.S. Fish and Wildlife Service, Hawaii Division of Forestry and Wildlife (DOFAW), City of Honolulu (City and County), and Parsons Brinckerhoff (consultant for HBCP), and several other biological consultants met at FHWA to discuss the section 7 consultation process for the North South Road and Kapolei Parkway construction project and HCP.

On February 3, 2004, the Service received a request from Parons Brinckerhoff, on behalf of FHWA, to issue a letter of interpretation to the project within the North South Road and Kapolei Parkway project area on Oahu. Representatives from the FHWA, Service, DOFAW, City and County, Parons Brinckerhoff, and Yukie Oishi met on February 13, 2004, to discuss the Service’s comments on the November 23, 2003, draft HCP and the section 7 consultation for the North South Road and Kapolei Parkway construction project.

On February 26, 2004, the FHWA organized a site visit to the naturally occurring populations of Abutilon menziesii at Kapolei, the Honolulu and Ewa Point sampling sites, and the DOFAW plant nursery above Dillingham Airfield. Representatives from the FHWA, Service, DOFAW, and Department of Hawaiian Home Lands (DHHL) and City and County participated.

In a letter dated March 26, 2004, the Service indicated that the endangered plant, Abutilon menziesii, is the only listed species currently found within the proposed project area. On March 26, 2004, the FHWA provided the Service with a copy of the final Habitat Conservation Plan (HCP) for Abutilon menziesii and requested validation of section 7 consultation for the proposed construction of the North South Road and Kapolei Parkway on Oahu.

In a letter dated April 22, 2004, the Service acknowledged the initiation of formal section 7 consultation as of March 26, 2004, and the FHWA’s request was received. The consultation would address impacts from construction of the North South Road and the Kapolei Parkway to the listed endangered plant Abutilon menziesii and impacts from the HCP.

Mr. Pat V. Phung

2
Mr. Pat V. Phung

BIOLICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The HDOT proposes to build the North-South Road, a limited-access, principal arterial roadway, which would connect the interstate H-1 Freeway to Kapolei Parkway. In addition, the City and County propose to build a portion of Kapolei Parkway between the intersections with Hawaii and South Road and Kamehameha Highway. Both the State and City and County actions are receiving funds through the FHWA, and will be treated as one project for environmental compliance purposes pursuant to the National Environmental Policy Act (NEPA) (HCP 2003). In addition, a number of proposed projects are anticipated to occur adjacent to the above projects. The projects include the development of campus lands by the University of Hawaii-West Oahu Campus, and unimproved rural development by the Department of Land and Natural Resources (DLNR). The unimproved development is collectively referred to as the "Kapolei projects." The Kapolei projects occur on 359 acres (1.45 acres or all of State-owned land in Kapolei, Oahu. The development of the Kapolei projects is expected to result in the removal of the existing Kapolei population of Hawaiian monk seals. To mitigate for the impacts of the proposed Kapolei projects, the HDOT developed the Habitat Conservation Plan for Adhesive removal at Kapolei (HCP) pursuant to Hawaii Revised Statutes § 135-22). The area for this consultation encompasses the area covered by the Kapolei Projects and the surrounding areas proposed in the HCP. Below is a description of the Kapolei projects and the HCP.

North-South Road

The proposed North-South Road will connect the Kapolei area and address multiple transportation needs. It would improve the existing transportation network in the area by acting as a circulatory route to both Fort Weaver and Fort Shafter Roads. This roadway serves as a major arterial roadway, connecting Kapolei to H-1 Freeway and Fort Shafter Road.

The North-South Road is planned to begin in late 2004, with completion in 2005 (HCP 2003). The North-South Road is also a 6-lane main collector roadway that will be approximately 3.6 kilometers (2.2 miles) long. Its alignment is adjacent to and toward the west of the roadway delineated by the existing Hawaiian Electric Company power lines corridor. The new roadway is designed with three vehicular lanes in each direction, a center median, and sidewalks on both sides with an overall width of 35 meters (114 feet) plus a hard surface.

The proposed project also includes the following three elements: 1) construction of a new interchange, connecting North-South Road and Kapolei Freeway, and 3) drainage features consisting of a drainage channel parallel to North-South Road and a detention basin. All project elements will be constructed in the roadway right-of-way (HCP 2003).
development of the campus and at present is planning a campus of approximately 40 ha (100 acres) which will be developed in phases to accommodate a student population of, ultimately, 7,600. An additional 61 ha (150 acres) of land will be allocated for future campus expansion, beyond the 7,600-student population. The University is also considering a number of land use options for the remaining 101 ha (250 acres) of land for the purpose of securing the campus and surrounding region. Construction of the second phase of the campus could begin in the latter part of 2004, with a completion date of fall 2007. The initial phase of campus development would be located in the northeastern portion of the property, in close proximity to Keawaula Highway (HCP 2004).

Department of Land and Natural Resources

The remaining unsold parcels (formerly part of the East Kapolei Master Plan) total approximately 243 ha (600 acres) in five parcels; the parcels are now under the purview of the DLNR Land Division and are the subject of the proposed North Shore Road and north of Farrington Highway. The Environmental Impact Statement for the East Kapolei Master Plan also includes 10 acres including recreational, public parks, schools, and streets for urban development and urban and open space areas on these parcels, which would serve as drainage detention basins. The ultimate use of these lands will be determined in the future when a development proposal in each parcel is submitted by the State or other non-governmental entity (HCP 2004).

Habitat Conservation Plan

In anticipation of the removal of the entire Kapolei population of Aplialus muricolor during an approximately 20-year development period, the HCPD developed a State HCP, with technical support from the Service and the Endangered Species Recovery Committee (ESRC). The HCP was completed in March of 2004. The HCP addresses anticipated impacts from the North Shore Road and Kapolei Parkway projects as well as future projects within the areas set aside in the population of A. muricolor at Kapolei. A series of actions are proposed that will protect these new and existing populations, protect the genetic integrity of the existing Kapolei population, and protect existing individuals by releasing them to the new population locations. The HCP also protects long-term management that would occur concurrently with project development to ensure that benefits are reaped for A. muricolor. The HCP's active mitigation effort will span a period of 20 years and is tied to the accomplishment of measurable goals as outlined in the HCP. In addition, the HCP provides additional funds to carry beyond 20 years for the long-term management of the three proposed sites (HCP 2004).

The preparation of the HCP was initiated in 1996 with two State sponsored development proposals. The first proposal involved a 1,339-acre East Kapolei Master Plan project to be developed by the HCCDI under a right-of-way agreement with the Department of Land and Natural Resources (DLNR). The second proposal by the HDOH involved the construction of the North Shore Road arterial highway, which would include the 1,339-acre property. The 2,760-acre parcel of HCP and HCCDI (HCP 2004).

In October of 1998, special funds in the amount of $57,850 from HCCDI were made available to DOWA to implement an incident management program for Aplialus muricolor on Oahu while the HCP was being developed. The incident management program included monitoring and providing protection for the species on the island; maintaining a complete genetic representation of the Kapolei population for existing DOWA assistance; establishing new populations of A. muricolor in appropriate habitat; restoring the biological environment and limiting factors of the species; and, providing initial funding for the construction of a DOWA-sponsored greenhouse dedicated to growing A. muricolor and other threatened and endangered plant species for reestablishing on Oahu (HCP 2004). However, the land of the Natural Resources in September 2005 transferred the 126 acres (610 acres) of State land to other State entities. The University of Hawaii received 200 ha (500 acres) for the development of the west Oahu campus (USWO), DLNR approved approximately 81 ha (200 acres) for residential development, and the remaining approximately 243 ha (600 acres) were assigned to DLNR. Thus, HCCDI currently no longer holds an interest in these Kapolei lands, and no longer a part of the HCP for this property (HCP 2004).

In addition, Aplialus muricolor has been substantially reduced on lands adjacent to the North Shore Road, and leased by the City and County. The City and County, therefore, required that its land be included in the HCP to allow for the construction of the proposed Kapolei Parkway segment and other potential future urban uses. Thus, the final HCP incorporated an additional approximately 33 ha (81 acres) for a total of approximately 159 ha (391 acres) of land (HCP 2004).

The HHTA has assumed sole ownership of the HCP and mitigation responsibility for the entire Kapolei population of Aplialus muricolor as described in a Memorandum of Agreement (MOA) with the UH (dated April 16, 2004). In addition, a written agreement requiring State incidental take permits for the Kapolei population when other properties are ready to be developed has been established (HCP 2004).

The HHTA will provide funding for the amount of $1,090,000 to stipulated in the MOA referred to above. On March 14, 2006, HHTA made available funds in the amount of $250,000 to conclude the incident management program for Aplialus muricolor and to indicate the first year increment of HCP implementation (HCP 2001). The additional $1,040,000 will be delegated to DLNR and placed into an interest bearing account prior to approval of the HCP.

The HHTA will establish a contingency fund and has developed a program for third party developers (Cooperators) to secure the State incidental take permits through a Consent of Issuance. The Cooperators would pay into a contingency fund for the following purposes: 1) to finance unanticipated costs incurred by $1,180 in the implementation of the HCP and, 2) to fund the management and monitoring of these endangered species beyond 20 years. The contingency fund is $0,000 will be included in the initial deposit at the end of the HCT 2001 and then be transferred to Cooperators. The contingency fund will be dedicated to HHTA and placed into an interest bearing account (HCP 2004).
In addition, the ICP established a 7.5 ha (18.5 acres) coastal reserve on-site, which permanently protects a colony of abalone on-ramp within Clarion C from development and the short-term success criteria for A. maselinei, as defined by the ICP, were not met at that site. The short-term success criteria for A. maselinei, as defined by the ICP, were not met at that site. The potential for successful site establishment on Oahu, as well as for management of the established populations and their habitat, the Kapolei population of A. maselinei is currently found in a small coastal area dominated by non-native vegetation (ICP 2000). Evaluating A. maselinei to several locations on Oahu to establish new populations are not expected to result in adverse effects to listed species within the on-site areas. Therefore, other local species will not be removed from this conservation.

STATUS OF THE SPECIES

Species Description
Abalone maselinei is a long-lived, protocaridid rock abalone in the family Muricidae. It has a light yellow to reddish brown body with an oval shell and yellow postorbital and auricular areas. The shell is about 10 cm long and weighs 350 grams. The species is found in rocky areas with a depth of 10 to 20 feet. It is a solitary species and is known to be nocturnal. The species is listed as critically endangered under the IUCN Red List.

Listing Status
Abalone maselinei was listed as endangered on September 26, 1980, and was proposed for listing in 1984. The species is currently listed as endangered under the Endangered Species Act.

Historic and Current Distribution
Abalone maselinei was historically found in a number of locations on Oahu, including Waimanalo, Kailua, and Kaneohe Bay. The species is currently found in limited areas on Oahu, including Waimanalo, Kailua, and Kaneohe Bay. The species is also found in limited areas on Maui, Molokai, and Lanai. The species is currently found in limited areas on Oahu, including Waimanalo, Kailua, and Kaneohe Bay. The species is also found in limited areas on Maui, Molokai, and Lanai.

Abalone maselinei has been reintroduced to Oahu, Maui, and Lanai, and is now found in a number of locations on these islands. The species is currently found in limited areas on Oahu, including Waimanalo, Kailua, and Kaneohe Bay. The species is also found in limited areas on Maui, Molokai, and Lanai. The species is currently found in limited areas on Oahu, including Waimanalo, Kailua, and Kaneohe Bay. The species is also found in limited areas on Maui, Molokai, and Lanai.
On the island of Maui, the native community of Abutilon menziesii would be lowland dry scenery and small "dry" foothills. All known populations of Abutilon menziesii are frequently exposed to severe drought and periodic flooding. Due to the presence of alien species surrounding stands of A. menziesii throughout its natural range, drastic habitat changes as established in a limited extent within existing A. menziesii stands on Lanai, but invasiveness potential is probably reduced by fire burning. Since A. menziesii may produce new leaves during a flush growth period in the wet season, dehiscence by seed pods on the Chosen was a notable feature may have a significant impact on the survival of the species. Carpenter bees and honeybees have been observed in the flowers, although the flowers seem to receive little attention because of the small size of the flowers. The native bee Nasonovia species has not been observed on flowers of this species, and may be more important as a pollinator in the past. A dual season flowering has also been observed, with flowers open in early morning, staying open throughout the day and also open in the evening and open during the night. This may imply the past existence of a nocturnal pollinator, although no such pollinator has been observed. In cultivation, A. menziesii tends to form colonies in a similar manner as in the wild, and grows quickly after transplanting to individual locations. Cultivated plants are reported to be thriving in warm locations from 33 to 55 mm (1/2 to 2 mm) with approximately 1.30 to 1.50 mmile (65 to 75 inches) of rain annually (Sharon 1995). Further research on the growth and needs of A. menziesii, specific environmental requirements, and other limiting factors are unknown.

Threats

The primary reason for the decline of Abutilon menziesii is habitat alteration by humans, either directly (e.g., conversion of habitat to agricultural use) or indirectly (e.g., introduction of exotic species). Surviving remnants of native vegetation on all islands within the historic range provide evidence that prior to the arrival of Polynesian colonizers, the islands were covered by forests and deciduous. Polynesian agriculture and fire undoubtedly significantly contributed to the decline of Polynesian agriculture, which cleared large areas of land for plantations and sugar cane cultivation, fragmentation of remaining natural areas such as pines (Cayuga pine), cacti, and poplar trees, and the introduction of animal species such as pigs (Cervus pacificus) and goats (Capra hircus). Enriched, fine, drained, alluvial, c useClass, from wetland sites, is the species. In addition, A. menziesii has been shown to hybridize with A. crenatum in the same habitat (Loreen 1995). Therefore, care should be taken to minimize this problem in none conservation efforts (Service 1993).

Conservation Efforts

There are no propagative efforts for this species at the Maui Botanical Garden, and none are known to maintain this species in none conservation efforts (Service 1993).
strategic plan is being developed by the Hawaii and Pacific Islands Terrestrial Coordinating Committee that will address the long-term conservation of A. meyenii. This plan will also include broader landscape actions that are needed for the recovery of this plant throughout its range (HPITCC, in prep. 2003).

ENVIRONMENTAL BASELINE

Status of the Species Within the Action Area

The action area (excluding the explanting site) was formerly cultivated sugarcane fields and is currently characterized as a disturbed coastal dry ecosystem. The vegetation of the area is generally low and shrub with a coastal fringe of native trees. In the past several years the area and surrounding lands have been taken out of sugarcane cultivation and put to other uses (e.g., urbanization, diversified agriculture, olive fields). (HCP 2004)

Several botanical surveys have been conducted within the area since 1996. Based upon these surveys, the status for naturally occurring A. meyenii within the action area has been established as 93 plants. These individuals are found in five clusters. Cluster A consists of 10 individuals and is located in the northern end of the farm road property. Cluster B consists of 14 individuals located along the western boundary of the farm property, which is ranked a high risk. Cluster C, the largest cluster, consists of 54 plants in the general area of the Hawaiian Electric Company powerline easement and the easter end of this area. Cluster D consists of a single plant in the central area of the site. However, this individual has not been seen since the initial recording. The seven individuals in Cluster B were spread over an 81-acre area and grew as single plants, except at one location along a fence line at the property boundary and access roadway. At this location, there is a large, multi-atomized plant, a young single-rooted plant, and a sedge (HCP 2004).

In 2001, through manual access and accidental destruction, the number of plants had declined to 30 in 50 plants (DLNR 2001). However, in 2001, 1168 healthy new plants were in close proximity of existing mature plants (DLNR 2001). The actual number of plants is difficult to determine due to the dry conditions at Kapoho, which may result in the dead or possibly revive during the wet season (DLNR 2001). Four plants were accidentally destroyed by being paved and streetlights were killed in January 2000 (HCP 2004).

The baseline of 93 individuals for A. meyenii established for the HCP will be used to describe the impacts to the species as a result of implementing the proposed projects. These 93 plants represent 90 percent of the naturally occurring A. meyenii on the Island of Oahu. This is the highest historically occurring population of A. meyenii on Oahu (HCP 2004; HINIP Database 2001).

On March 14, 2001, HDOI requested the expenditure of $125,000 to DLNR for the implementation of conservation strategies, as outlined in the HCP, for years one through five. Funds became available in August 2001 and are being used by DLNR to complete the Action Management Program that was initiated by HCDLI and to transition to implementation of the HCP (HCP 2001).

The preliminary results of the Action Management Program indicate that propagation of the species from cuttings and seeds is highly successful in a controlled nursery environment. Outplanting to off-site locations has also been successful in the first year. The Action Management Report for Abalon rests manuscript (DLNR 2001) and the Final Intertive Management for Abalon manuscript (DLNR 2003) are summarized below.

The Scope of Services for the Action Management Program include the following five tasks:

Task 1: maintain an in situ population through monitoring, maintenance, and security (fire prevention).
Task 2: propagate a total of representatives of plants, through seeds and cuttings, from the Kapoho Abalon resting population to be used to maintain genetic representation of stock and provide stock for outplanting purposes to be conducted at the existing DLNAP plant nursery. Task 3: establish new populations of A. meyenii in appropriate habitats to allow natural establishment and long-term viability. Task 4: assess the viability of the species and determine seedling requirements, test and package seed, and monitor backcross (4 + asexual), managed methods, and Task 5: provide partial funding for the construction of a low-elevation greenhouse dedicated to growing A. meyenii and other threatened and endangered plant species on Oahu to be owned and operated by DLNAP, including A. meyenii from the Kapoho population for the duration of implementation of the HCP (HCP 2004). A summary of on-going conservation actions, as outlined in the HCP, is given below:

Task 1: All known Kapoho plants have been marked with permanent stakes and mapped using a Geographic Information System (GIS) layer. The existing plant site being maintained by weeding, fencing, chemical and manual control methods, and applying pesticide and fertilizer, as necessary. A fire management strategy consisting of: the following measures in being implemented to ensure that the site is not accidentally damaged by fire: i) for fire fighting, resources available near the Kapoho population have been identified, ii) information has been provided to fire stations to assist them in protecting Abalon non-native from fire, and iii) water resources near the Kapoho population have been identified (HCP 2004).

Task 2: All known Kapoho plants have been propagated from cuttings resulting in 650 first generation cuttings from 62 in situ individuals. In addition, 220 seedlings have been produced from seed collected from the first generation nursery plants grown from cuttings. Additional
Trends have been distributed to Lynne Altvater, the National Seed Storage Laboratory in Fort Collins, Colorado, and the Pacific Rim Plant Facility (ICP 2004).

Task 3. The following three unplanted populations of \textit{Allophylus mexicanus} have been visited:
- Inland Center Staked Grouse, Siskiyou Point State Park, and the Drakesbad Unit of the Pearl Harbor National Wildlife Refuge. Each site was visited with a representative sub-sample of the \textit{Euphorbia} plants and each individual plant was tagged with a permanent metal tag (ICP 2004).

Site-specific information can be found in the ICP.

Task 4. In an effort to control impacts from ants on \textit{Allophylus mexicanus}, Granville divisia has been tested and determined to be successful in field applications. In addition, atrazine and desmerb have been tested to determine if the chemicals are toxic to \textit{A. mexicanus} (ICP 2004).

Task 5. The construction of the Bingham Grousehead by DODAAL has been completed. A 517 square ft (46,000 sq ft) greenhouse dedicated to the propagation of \textit{Allophylus mexicanus} and other threatened and embattled plant species on Oahu is located near the base of the Koko Trail, just behind the western end of Bingham Airfield in Hawaii. The land falls under the control of the USN Land Division and is in the process of being transferred to DODAAL. The greenhouse includes the installation of water and electrical systems. The greenhouse is 40 m (130 ft) long by 12 m (40 ft) by 6 m (12 ft) tall. It is divided into an upper and a lower system along the entire length. All propagation of \textit{A. mexicanus} now occurs at this new facility (ICP 2004).

Effects of the Actinids

The proposed action includes implementation of the \textit{Euphorb} projects as well as the implementation of the HCP. For the purposes of the following analysis, the numbers of individuals at Kapolei reflect the baseline established in the HCP. However, because of natural and environmental factors, the actual number of individuals may be different. In fact, we have seen a decline in the number of individuals since the baseline for the HCP was established.

In order to analyze the anticipated effects of the proposed action on the species, it is necessary to consider the effects of a no action scenario. The species currently occupies an area of highly disturbed non-native grassland that generally outcompetes \textit{A. mexicanus} for resources. In addition, the grasslands increase the susceptibility of the area to catastrophic fire events that would extirpate the species from this area. Proposed on future development is also eliminating the population as it could significantly reduce the area in a place where the population would not be anticipated to persist. Unfortunately, it has been determined that species continue to exist in Hawaii without a specific management plan due to ongoing threats of habitat degradation. For example, at least two species have been extirpated in the wild from the Kalalau Mountain range on Oahu in the last ten years (Kalalau watershed and Cane chase plant(s)).

The Natural Conservancy of Hawaii, pers. comm. 2001). Therefore, it is unlikely that if the population were left without management in its current location that it would persist over time due to habitat loss and degradation. The loss of this population would result in a reduction in the habitat distribution, as it would remove the species only naturally occurring, expanding population from Oahu.

Development of the Kapolei projects over a 20 year period as anticipated, will ultimately result in the removal of all \textit{Allophylus mexicanus} plants (57 individuals), the associated seed bank, and surrounding habitat at Kapolei. The following is a description of how each project will impact the \textit{Allophylus} population of \textit{A. mexicanus} (ICP 2004).

The construction of the North South Road and the Kapolei Parkway is expected to remove 28 plants within chinks C-1, C-2 and E of the Kapolei population of \textit{Allophylus mexicanus} as well as the seed bank and existing habitat surrounding these chinks. The removal of the plants is anticipated to occur between 2004 and 2005.

Development of OHHN lands will initially affect Cluster B followed by Cluster A. It is expected that this development will ultimately remove approximately 28 individuals of \textit{A. mexicanus}, the seed bank, and habitat surrounding clusters A and B. The removal of these plants is anticipated to occur sometime between 2009 and 2010.

Development of the UHWO campus involves the removal of approximately four individuals of \textit{A. mexicanus}, the seed bank, and habitat surrounding clusters C and D. These four plants are expected to be removed in the future phase of the campus. The removal date of these plants is uncertain but will occur after Phase I (completion date estimated for 2007) and 2 (undetermined completion date) are completed.

If all of the lands within the ELEK plan are developed, including the 18 rate contingency reserve site, approximately 37 individuals of \textit{A. mexicanus}, the seed bank, and habitat surrounding clusters C, D will be removed. The development plans are conceptual and development activities have yet to be determined. At this time, therefore, we do not have an estimated removal date of the plants on this parcel of land.

The phasing of the development is an important factor in reducing the likelihood that all of the individuals will be lost at one time in time and increasing the probability that the conservation measures will be successful for the following reasons: 1) it provides a longer time period to collect genetic material from all of the native plants as well as seedlings thereby increasing the likelihood that the surviving plants will have good genetic representation; 2) the threat of fire will be reduced at the contingency reserve site until at least one surviving site ensures the success criteria thereby reducing the possibility of a stochastic event exterminating the existing population; and 3) it provides time to solve any problems that may arise in establishing the site without taking steps through the established adaptive management plan.

The HCP establishes a process for third party developers (Consortium) to utilize the State incidental take license through a Permit of Inclusion. The Consortium would pay into a contingency fund to finance out-of-pocket costs incurred by ULEK in the implementation of the HCP, and to fund the management and monitoring of these unplanted population beyond 20
Mr. Par V. Phang

The contingency fund of $200,000 will include an initial deposit of the full amount by HDOT in and then be supplemented by Cooperatives. The contingency fund will be used to remediate a site in the event that any problems occur with the project. The contingency fund will be set aside for use in case of unexpected costs or delays in the project.

In anticipation of the short term funding needs, the HCP recommends developing a short term funding strategy to ensure that the project is not delayed due to unforeseen circumstances.

To achieve the goals of the HCP, the adaptive management plan describes the monitoring and management of the species and habitat. The plan includes the following objectives:

1. To monitor the population and habitat of the species to determine if the goals set in the HCP are being met.
2. To implement management actions as needed to maintain the population and habitat of the species.
3. To develop an adaptive management plan that can be modified as new information becomes available.

In conclusion, the adaptive management plan for the species is successful in maintaining the population and habitat of the species and ensuring the long-term survival of the species.

Mr. Par V. Phang

The HCP recommends developing a short term funding strategy to ensure that the project is not delayed due to unforeseen circumstances. The contingency fund will be set aside for use in case of unexpected costs or delays in the project.

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1. To monitor the population and habitat of the species to determine if the goals set in the HCP are being met.
2. To implement management actions as needed to maintain the population and habitat of the species.
3. To develop an adaptive management plan that can be modified as new information becomes available.

In conclusion, the adaptive management plan for the species is successful in maintaining the population and habitat of the species and ensuring the long-term survival of the species.
unlikely that if the population were left in its current location it would persist over time without management due to habitat degradation (e.g., development, and the threat of fire. The Service considered the continued risk of extinction to A. rossii in the evaluation of the effects of the proposed action. Implementation of the HCP will result in the net conservation benefit for A. rossii and avoid jeopardy for the following reasons: the HCP is tied to the accomplishment of measurable goals and success criteria that will result in the establishment of a minimum of five off-site, self-sustaining populations that meet stabilization criteria for the species, the HCP provides adaptive management strategies and monitoring to ensure the goals and success criteria of the HCP is sustained within the 20-year of active management, the contingency fund for unforeseen circumstances, and funds for long-term management of the three established populations; and the establishment of a 1.3 ha (4.3 ac) contingency reserve site, which temporarily protects a portion of the Kapuia population of A. rossii from development until the short-term success criteria is met at the off-site location; and the contingency reserve site will serve as a population if any of the three off-site locations do not meet the long-term success criteria.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to fulfill the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize and avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, and to develop information. The recommendations provided relate only to the proposed action and do not necessarily represent complete fulfillment of the FWS's Section 7(a)(1) responsibilities for the species.

We recommend that comments regarding the physical and biological needs, and past and current status of the species be considered in order to gain a better understanding of the specific requirements and limiting factors for A. rossii. This knowledge will aid the successful implementation and outcomes of the proposed project. In addition, we recommend that an effort be made to collect the field data for the proposed reclamation sites to further minimize adverse impacts to the species. In order for the Service to be kept informed of actions monitoring or avoiding adverse effects to benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REHABILITATING CLOSING STATEMENT

This concludes formal consultation on this action. If the project description changes that the FWS will be required to maintain formal consultation to allow for re-evaluation of project effects within the context of the environmental baseline for A. rossii, which is covered in this biological opinion. As required in 50 CFR § 402.16, monitoring of effectiveness is required when discretionary Federal agency involvement or action over the action has been obtained (or is authorized by law), and if (1) new information reveals effects of the agency action that may affect listed species in a manner to an extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in this opinion; or (3) a new species is listed or critical habitat designated that may be affected by the action.

The FWS will coordinate with the Service if an unforeseen event occurs that significantly changes the baseline of the species. As stated in the Conclusion above, the Service's finding of no jeopardy is based on the conservation measures built into the project by the FWS as part of the HCP. Should there be a failure to carry out any or all of the designed measures, or if the measures are not effective, or if these measures are modified in any way that is not accepted through the FWS review process, submission of consultation will be required. If you have any questions regarding this biological opinion, please contact Ms. Marigold Zoll of my staff at (808) 792-9100.

Sincerely,

[Signature]

Acting Field Supervisor

Ms. Helene Oppen, IHQ
Ms. Faith Miyamoto, USFWS Honolulu
Mr. Paul Carey, USFWS.
Literature Cited


February 27, 1996

Mr. Don J. Hibbard
Administrator
State Historic Preservation Division
Department of Land and Natural Resources
Suite of Hawaii
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Subject: North-South Road Corridor Project, Ewa, Oahu

A new north-south arterial roadway is being proposed in Ewa, Oahu, between Interstate H-1 and the proposed Iwaiwa transit project. A location map showing the project area is attached for your use. As part of this project, we will complete a major environmental study (EIS) prior to the preparation of a NEPA/HAER Chapter 343 environmental document. The purpose of this letter is to request coordination with the State Historic Preservation Division (SHPD) on both the EIS and the associated environmental document.

The proposed North-South Road will cross the OR&L right-of-way within Ewa Villages. It is our understanding that the OR&L right-of-way is listed on the National Register of Historic Places. Because the termini of North-South Road lie on either side of the OR&L right-of-way, all alternatives cross the OR&L right-of-way. Even the No Build alternative would affect the right-of-way. Sections of the North-South Road have been or are about to be constructed as part of residential developments. These segments, especially in the vicinity of the Ewa Villages and Ewa Gentry developments, would cross the OR&L right-of-way when completed. Furthermore, the Ewa Villages portion of the roadway would be in close proximity to other historic resources.

Our consultant for this project, Parsons Brinckerhoff, Inc., has already contacted Mr. Nathan Napapa of your staff. He mentioned that the State Department of Transportation (SDOT) is the owner of the right-of-way and suggested that we coordinate with the SDOT regarding OR&L issues. We have talked to Mr. Bob Jazula of the SDOT, and he stated that his involvement in the project would not occur until plans are submitted. He mentioned that they often consult with the Hawaiian Railway Society regarding impacts to the OR&L right-of-way. With this information, we sent a letter to the Hawaiian Railway Society requesting input on how we can minimize and/or mitigate adverse impacts.

We would appreciate any comments the SHPD may have regarding North-South Road's potential impacts on the OR&L right-of-way and other historic resources in Ewa Villages. We would also like to clarify the documentation requirements for the forthcoming environmental assessment.

Please call Mr. Gregory Hee at 527-6893 if you have any questions or require additional information. Your assistance in this matter will be greatly appreciated.

Respectfully,

[Signature]

Director

Enclosure: Project location map
Mr. Don S. Hibbard
State Historic Preservation Officer
Department of Land and Natural Resources
13 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard,

Subject: Determination of Effect, Section 106

North-South Road
Ewa, Oahu

The purpose of this letter is to request the concurrence of the State Historic Preservation Officer (SHPO) regarding the "no effect" determination for the proposed highway as described below. Since the proposed highway will be federally funded, compliance with Section 106 of the National Historic Preservation Act is required, which in turn, necessitates SHPO concurrence with this determination.

An archaeological and historic reconnaissance survey (conducted) conducted by Cultural Surveys Hawaii for this project found the two following historic sites near the proposed highway alignments:

- The Ewa Village Historic District (Site 50-82-12-9716), nominated for National Register of Historic Places status, and
- The Oahu Railway and Land Company (OR&L) Right-of-Way (Site 50-80-12-9711), listed in the National Register of Historic Places.

As indicated in the enclosed "Section 106 Report" for this project, the roadway would be constructed west of the Ewa Village Historic District and north of the OR&L Right-of-Way. The roadway would generally run along the western edge of the recently constructed HECO 118 kV transmission line.

The "no effect" determination is based on the following: (1) the proposed highway right-of-way will not encompass any of the identified historic sites, and (2) the proposed roadway would not change the characteristics of the site that qualified them for National Register recognition.

Please contact me at 541-2536 if there are any questions.

Sincerely yours,

[Signature]

Pat V. Phung, P.E.
Transportation Engineer

Enclosures
Mr. Pat V. Phung
Transportation Engineer
U.S. Department of Transportation
Federal Highway Administration
Hawaii Division
300 Ali Iwaiwa Blvd., Room 3202
Honolulu, Hawaii 96810

Dear Mr. Phung,

SUBJECT: Section 106 Review (NHPA)
North South Road
TMR 9-3, Eva, Oahu

Thank you for the letter dated November 6, 1997, regarding proposed North South Road corridor location, in the September 1997 Report. A review of our records shows that there are no known historic sites at the project location. An Archaeological Reconnaissance Survey of the North South Road Corridor by Cultural Surveys Hawaii submitted with the review provides an assessment and photos. It indicates that no archaeological sites are likely to be present in the project area because of past development and past land use for sugarcane cultivation. Thus, we believe that this project will have "no effect" on archaeological sites.

While the project is near the Eva Villages Historic District and the Oahu Railway and Land Right of Way, the proposed highway right of way will not encroach upon the sites or change the characteristics of the site that qualified them for National Register recognition.

We concur with the determination that the project will have "no effect" on any known historic resources. It appears that the proposed Kapolei Parkway may impact the ORL right of way. We look forward to consultation for that project in the future. Thank you for the opportunity to comment. Should you have any questions, please contact Carol Ogata at 587-0004.

Aloha,

MICHAEL W. VALTON, Chairperson
and
State Historic Preservation Officer

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Hawaii Division
500 Ali Iwaiwa Blvd. Room 3202
Honolulu, Hawaii 96810
February 4, 1999

Mr. Katsu Hayashida
Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

To: Neison Suggs

Subject: North South Road, City & County of Honolulu, Hawaii
Section 106 Review

The State Historic Preservation Officer (SHPO) has reviewed the documentation for the subject project. In accordance with Section 106 of the National Historic Preservation Act (NHPA), the SHPO has concurred that the subject project will have "no effect" on archaeological sites and any known historic resources. Enclosed is the correspondence from the SHPO.

Please contact me at 541-2536 if there are any questions.

Sincerely yours,

Pat V. Phung, P.E.
Transportation Engineer

Enclosure
Ms. P. Holly McElroy, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
Kakaako Tower, Room 303
601 Kamuela Boulevard
Honolulu, HI 96814

Dear Ms. McElroy:

Subject: North-South Road and Kapiolani Boulevard Project
State Historic Preservation Act, Section 106 Consultation

The Federal Highway Administration (FHWA), along with the State Department of Transportation, Highways Division (HDOT) and the City and County of Honolulu (City), have initiated a review of the subject project, which will include compliance with Section 106 of the National Historic Preservation Act (NHPA). We request your review and comment on the updated "understanding" document, proposed Area of Potential Effect (APE) for the project, and anticipated consultation efforts with other parties, as described below. This letter also summarizes our consultation activities to date with your Historic Preservation Division staff.

Proposed Undertaking and Changes Since 1993

The proposed undertaking consists of the following elements (see enclosed figure):

- North-South Road. A new six-lane State roadway facility between the H-1 Freeway and the future Kapiolani Boulevard. North-South Road would include a landscaped median, sidewalks, a bike path, a new interchange at the H-1 Freeway, and an ar grade signalized intersection at Farrington Highway.

- Drainage improvements associated with North-South Road. Kahului Gulch would be tributary to two places by North-South Road, a drainage channel would be provided parallel to North-South Road, and a detention basin would be constructed on the downstream end of North-South Road. These drainage improvements would be designed to control the floodplain impacts of the undertaking.

- Kapiolani Boulevard. A new six-lane City roadway facility between the future North-South Road and Borron Road. Kapiolani Parkway would include a landscaped median, sidewalks, a bike path, and an ar grade signalized intersection with North-South Road and Roton Road.

The undertaking described above is different from the undertaking we proposed in 1993-1994. The previous undertaking included only the North-South Road, with an interchange at the H-1 Freeway. It did not include the drainage improvements, nor did it include development of a portion of Kapiolani Parkway.

We submitted a Draft Environmental Assessment (DEA) (September 1995) for the previous undertaking, which was approved on December 22, 1998, edition of the Environmental Impact Statement. The project was delayed after 1998 because of regulatory complications in addressing the potential impacts to an enlarged plant process, the Kewalo Aquatic Life Areas, and the project area. The HDOT has just completed a Habitat Conservation Plan for the Kapiolani site. Therefore, we anticipate that the project can now move forward. We are currently preparing a Revised DEA for the new undertaking.

Another changed project condition is that the 1993 DEA anticipated a major land development encompassing most of North-South Road, proposed by the State's Housing Finance and Development Corporation (new Housing and Community Development Corporation of Hawaii, or HCDC). The HCDC has now dropped its East Kapolei project, which would have required Kahului Gulch.

Previous Section 106 Activities

In 1998 we completed the NHPA Section 106 process for the previous undertaking, which resulted in a FHWA "no effect" determination and State Historic Preservation Office (SHPO) concurrence under the old NHPA Section 106 (letter correspondence dated November 5, 1997, and January 31, 1998).

Area of Potential Effect (APE) of New Undertaking

Based on the description of the new undertaking presented above, FHWA has determined that the APE pursuant to NHPA Section 106 to be the following:

- Right-of-way of North-South Road from its interchange with the H-1 Freeway to Kapiolani Parkway, including the land needed for the drainage channel and detention basin; and

- Right-of-way of Kapiolani Parkway from its interchange with the proposed North-South Road to its intersection with Roton Road.
Consultation with Historic Preservation Division Staff

The project consultant, Parsons Brinckerhoff (PB), has initiated consultation with your Historic Preservation Division staff regarding the new undertaking. In an e-mail correspondence dated March 14, 2004, Mr. Sam Collast provided the following comments regarding the new undertaking's potential impact on archaeological resources (i.e., pre-contact or Native Hawaiian historic properties):

After completing the previous survey area with the proposed changes, and after looking at aerial photos, the "new" portion of the corridor is clearly in former sugar lands. Consequently, given that the earlier survey found nothing, and given that the "new" portion of the corridor was in sugar cane, we still believe -- from the standpoint of archaeology -- that "no historic properties will be affected."

In regards to post-contact historic properties, the FHWA feels that a portion of the Iwa Villages Historic District (State Site 30-80-12-976) will be within the AFE. The boundary of the historic district is limited to Pauoa Road between Vaunau and Tonuppy Villages. The new Kapolei Parkway will cross Pauoa Road at that location, and therefore, a portion of the intersection will be within the historic district. PB conducted a site visit with Mr. Susan Tassaki of your staff on March 15, 2004. We informed Mr. Tassaki that we anticipate the new intersection to warrant traffic signals because of projected traffic volumes. Mr. Tassaki expressed concern about traffic signals at the intersection because they would be the first within the historic district.

Consultation with Other Parties

We plan to involve the following organizations to participate in NEPA Section 106 consultation:

- Office of Hawaiian Affairs
- Historic Hawaiian Foundation
- Ho Na Hana I Ka Kapena O Hawai'i Nui
- Oahu Island Rural Council
- Hawaiian Railway Society

Please advise me at your earliest convenience if other organizations or individuals should participate in the consultation.

In summary, the FHWA, along with the BDG and the City, has initiated environmental review of the newly defined North-South Road and Kapolei Parkway project, including the NEPA Section 106 process. We have consulted with State Historic Preservation Division staff and plan to initiate consultation with other interested parties.

We ask that the SHPO review and provide any comments it may have regarding our proposed APE definition and planned consultation activities within 30 days of receipt of this letter. Upon completion of the consultation period, the FHWA will submit a letter of determination for the SHPO's concurrence.

If you have any questions or require additional information, please do not hesitate to contact me at 511-3780 (extension 300) or via email at Pat.Phang@Hawaii.Gov.

Sincerely yours,

[signature]

Pat P. Phang, P.E.
Transportation Engineer

Enc: Project Elements (map)

By Certified Mail

cc: Mr. Nelson Sagan, BDG, HWY-PA
    Mrs. Terri Miyamoto, City & County of Honolulu, OIT
    Mr. Nahe Ohehine, PB
May 7, 2004

To:
Holly McElhenny, Administrator
State Historic Preservation Office
Department of the Interior
Kamehameha Building, Room 555
601 Kamohila Boulevard
Kapolei, HI 96707

Subject: North-South Road and Kapolei Parkway Project
National Historic Preservation Act, Section 106 Coordination and Review

Dear Ms. McElhenny:

Thank you for your letter dated April 21, 2004, responding to our request for your review of the updated "undertaking," subject to Section 106 of the National Historic Preservation Act (NHPA).

In light of your opinion of an "adverse effect" determination for architectural concerns, we will continue to work with your staff to determine the architectural treatments appropriate for proposed traffic signs in the historic district at Ewa Plantation (Route 52 9912-9786). The environmental assessment being prepared for the project will include a Section 4(f) evaluation, pursuant to the Department of Transportation Act of 1966.

Your letter indicates that there would be "no historic properties affected" from the standpoint of archaeology, given the area's previous sugar cane cultivation and the lack of any archaeological sites in the vicinity.

When consultation with other parties has been completed, the Federal Highway Administration will issue a Section 106 effect determination for the proposed project. If you have any questions or require additional information, please do not hesitate to contact me at 541-2700 (extension 305) or via email at Pat.Phuong@fhwa.dot.gov.

Sincerely yours,

Pat V. Phuong, P.E.
Transportation Engineer

cc: Ms. Nelson Sagum, HDOT, HWY-PA
Ms. Faith Miyake, City & County of Honolulu, DTS
Ms. Nani Okano, PB
August 20, 2004

To: Ms. P. Holly McElhenny, Administrator
   State Historic Preservation Division
   Kukuihulea Building, Room 555
   601 Kamohila Boulevard
   Kapolei, Hawaii 96707

From: Ms. McElhenny:

Subject: Request for Concurrence on Effect Determination

The Federal Highway Administration, the State of Hawaii Department of Transportation (HDOT), and the City and County of Honolulu, Hawaii, are proposing to construct North-South Road and Kapolei Parkway between Renton Road and North-South Road, Ewa, Oahu. The makua terminus of North-South Road would be at the H-1 Freeway. The purpose of this letter is to request that the State Historic Preservation Officer (SHPO) comment on our effect determinations in accordance with Section 106 of the National Historic Preservation Act (NHPA).

As described in our letter dated March 31, 2004, the FHWA determined that a portion of the Ewa Sugar Plantation Village (Ewa Village) Historic District (State Site No.12-129764) will be within the project's Area of Potential Effect (APE). The district is listed in the Hawaii Register of Historic Places, and is eligible for listing in the National Register of Historic Places. The portion of the historic district within the APE is limited to Renton Road between Varano and Tankers Villages. The new Kapolei Parkway will run Renton Road at this location, and therefore, a portion of the intersection will be within the historic district. At the time of the March 31, 2004 letter, the FHWA was not aware of any other historic property in the APE.

In a letter dated April 21, 2004, which was in response to our March 31, 2004 letter, the SHPO provided an opinion that the project would have an adverse effect on the Ewa Village Historic District because the Kapolei Parkway and Renton Road intersection warrants traffic signals, which might not be architecturally consistent with the historic district. As a follow-up to this assessment, a site visit was held on July 16, 2004, which involved staff from the SHPO, HDOT, HDC and the project consultant, to re-evaluate the potential impacts of the proposed Kapolei Parkway and Renton Road intersection and its traffic signals on the historic district. All parties agreed that the proposed intersection and traffic signals would not cause an adverse effect on the historic district because the intersection will be located in a relatively isolated area of the historic district, and not within the district proper, which contains the mill buildings, the plantation manager's house and other contributing or individually historic structures.

For your information, HDC is currently constructing Kapolei Parkway from the ORAL Right-of-Way in Ewa Gentry to Renton Road, along the border of Ewa Mokili District Park. Because this project includes a new intersection with Renton Road, HDC will also upgrade the unpaved section of Renton Road surrounding the new intersection by extending the curb, gutter and sidewalks that currently end at the Renton Road Bridge or at Kekai Gulch. The former Kapolei Parkway, both makua and makahiku of Renton Road, will be similar in appearance to the existing Kapolei Parkway in Ewa Gentry. It will include sidewalks, bike-pedestrian paths, and landscaped medians.

Over 20 organizations and individuals, which included the Office of Hawaiian Affairs, the Oahu Island Council, Hui Maha, the Hawaiian Railway Society, and the Ewa Village Homeowners Association, were invited in May 2004 to participate in consultation to help us identify historic properties in the APE, and to comment on potential impacts to the historic district. To date, we have not received any significant comments regarding historic properties or issues.

Based on the information herein provided and in accordance with NHPA Section 106, the FHWA has rendered a "no adverse properties affected" determination with regards to archaeology. With regards to the Ewa Village Historic District, the FHWA has issued a "no adverse effect" determination. Despite this "no adverse effect" determination, we will direct HDC, who will be responsible for constructing the Kapolei Parkway/Renton Road intersection, to consult with the SHPO on the architectural design of the traffic signals. This will be stated in our environmental assessment prepared pursuant to the National Environmental Policy Act.

The FHWA requests that the SHPO provide written concurrence with these effect determinations.

If you have any questions or require additional information on the project, please do not hesitate to call me at 541-2700 (ext. 350).

Sincerely yours,

Pat V. Phung, P.E.
Transportation Engineer

By Certified Mail

cc: Ms. Nelson Sugan, HDOH, HWY-PA
Ms. Triki Miyamoto, City & County of Honolulu OHW
Ms. Wayne Yoshida, Forest & Rangeland Policy & Outreach, Inc.
September 8, 2004

Mr. Pat V. Phung, P.E.
Transportation Engineer
Hawaii Division, Federal Highway Administration
Box 50256
Honolulu, Hawaii 96850

Dear Mr. Phung:

SUBJECT: Section 106 of the National Historic Preservation Act - Proposed North-South Road and Kapolei Parkway Project, City and County of Honolulu

Thank you for your letter of August 29, 2004 in which you seek our concurrence on a determination of "no adverse effect" for the proposed North-South Road and Kapolei Parkway being planned by the City and County of Honolulu.

As correctly stated in your letter, we agreed in previous correspondence that no archaeological properties would be affected by the project. Most of the project area has been highly altered by intensive cultivation and no historic properties were identified in those portions of the project area surveyed. Remaining at issue was the possible effect the proposed roadway and road could have on the Kauai Sugar Plantation Village Historic District (Site 50-WK-12-5715) which is listed on the Hawaii Register of Historic Places. The proposed roadway crosses a stretch of North Road which links the historic villages of Waimea and Lihue. The boundary of the Historic District runs along this stretch to include North Road.

Your letter also recounts the field inspection conducted by our staff and that of the State Department of Transportation and the City and County Department of Design and Construction on July 16, 2004. Discussed was the design of the proposed intersection at North Road and improvements such as curbs, gutters, sidewalks, median strips and traffic signals. This stretch of North Road has been significantly modified since the plantation era and it crosses a modern bridge immediately to the east of the proposed intersection. After the bridge it is curved and lined with modern streetlights as it passes through Tenney Village.

Given these modern alterations we believe that the stretch of North Road crossed by the proposed roadway is not a contributing property to the Historic District and we concur that the proposed design will have "no adverse effect" on the Historic District as a whole or its integrity. We do this with the understanding that it is still important to ensure that the proposed intersection does not detract from the setting as little as possible. As discussed in our recent meeting, we also seek that the intersection design and traffic signals allow residents of the district plantation village that it retains its original purpose of linking these villages to the plantation village and that it remains a framed view corridor. We believe it will not be sufficient to rely on traffic signals being an automatic setting based solely on traffic demand. We seek that signal timing have a favorable preference for North Road traffic during non-peak hours regardless of traffic demand on the Kapolei Parkway and North South Road. We look forward to reviewing the more detailed design plans when they become available.

If you have any questions about the Historic District or the effects of the project on architectural properties, please call Thomas Linn at 692-8050. Archaeological questions may be directed to Sune Golvin at 692-8028.

Sincerely,

Peter T. Yamasaki
State Historic Preservation Officer

cc: Mr. Daniel Sagay
Ms. Fusha Miyamoto, City and County of Honolulu OHA
Ms. Waye Yoshikawa, Parsons Brinckerhoff Quade & Douglas, Inc.
Mr. Clyde Nakamura, Administrator
Office of Hawaiian Affairs
711 Kapahulu Avenue, Suite 500
Honolulu, HI 96813

Attention: Ms. Heidi Kai Grill

Dear Mr. Nakamura,

Subject: Section 106, National Historic Preservation Act Consultation for the North-South Road and Kapolei Parkway Project

The Federal Highway Administration (FHWA), the State of Hawaii Department of Transportation (HIDOT), and the City and County of Honolulu (C&O) intend to construct the North-South Road and a portion of Kapolei Parkway from North-South Road to Kamehameha Highway (see enclosed map).

The purpose of the project is to improve the transportation network in the Ewa Plain and provide additional roadway capacity to meet existing and future transportation demands. An Historic Resources Assessment is being prepared and will be released for public review this summer. Federal law requires that projects with federal participation consult with interested parties regarding potential impacts to historic properties, which include archaeological resources, historic buildings or structures, and traditional cultural properties. Therefore, we request your review and comment on the project, particularly from the standpoint of potential for impacts on historic properties.

We have already coordinated with the State Historic Preservation Division (SHPD). The SHPD has expressed that it has no archaeological concerns with this project, given past sugar cane cultivation uses in the project area, and the lack of any archaeological sites recorded in a 1996 survey conducted for the North-South Road portion of the project, as well as other studies conducted in the area.

However, the SHPD has architectural concerns because the traffic signals proposed at the intersection of Kapolei Parkway and Kamehameha Highway would be the first within the historic district of Ewa Plantation Village (State Site 56-B0-12-9788). The project's design team will coordinate with the SHPD to determine the best architectural treatment possible for these traffic signals.

If you have any comments or concerns about the project, we ask that you provide them by phone or letter correspondence within 30 days of receipt of this letter. If you require additional time to respond to this request, have additional questions, or require further information, please do not hesitate to call me at (808) 541-2700, extension 309.

Sincerely yours,

Pat V. Phang, P.E.
Transportation Engineer

Enclosure: Project map

cc:
Mr. Nelson Sagum, HIDOT, JPVY-PA
Ms. Faith Miyawaki, City & County of Honolulu, UDS
Mr. Wayne Yoshida, PHD
May 7, 2004

See Attached List

Subject: North South Road and Kapolei Parkway Project

The Federal Highway Administration (FHWA), the State of Hawaii Department of Transportation (HDOT), and the City and County of Honolulu (City), intend to construct the North South Road and a portion of Kapolei Parkway from North South Road to RTenon Road (see enclosed map). Parsons Brinckerhoff is the project consultant on this project.

The purpose of the project is to improve the transportation network in the Ewa plain and provide additional roadway capacity to meet existing and future transportation demands. An Environmental Assessment is being prepared and will be released for public review this summer.

Federal law requires that projects with federal participation consult with interested parties regarding potential impacts to historic properties, which include archaeological resources, historic buildings or structures, and traditional cultural properties. Therefore, we request your review and comment on the project, particularly from the standpoint of potential for impacts on historic properties.

We have already coordinated with the State Historic Preservation Division (SHPD). SHPD has expressed that they have no archaeological concerns with this project, given past use and significant use in the project area, and the lack of any archaeological sites identified in a 1996 survey conducted for the North South Road portion of the project, as well as other studies conducted in the area.

However, SHPD has architectural concerns because the traffic signals proposed at the intersection of Kapolei Parkway and RTenon Road would be the first within the historic district at Ewa Plantation Village (Site #10-12-07336). The project's design team will consult with SHPD to determine the best architectural treatment possible for these traffic signals.

If you have any comments or concerns about the project, we ask that you provide them by phone or via correspondence within 30 days of receipt of this letter. If you require additional time to respond to this request, have additional questions, or require further information, please do not hesitate to call me or Ms. Nani Ohime at (808) 331-5024.
North-South Road and Kapolei Parkway
Section 106 Consultation List

John Keala, President
Ali`iulani Hawaino in Kapiolani Civic Club
P.O. Box 700097
Kapolei, HI 96707-0007

Frances Rivera
Ikeb & Gina Club
91-844 Furlin Waihe Rd
Ewa Beach, HI 96706

Calvary Chapel
91-928 Furlin Waihe Rd
Ewa Beach, HI 96706

Dorothy White
Ewa Beach Community Association
P.O. Box 2033
Ewa Beach, HI 96706

Ewa Hongman
P.O. Box 6845
Ewa, HI 96707-7549

cbo Lustino Ramos
Ewa Task Force
91-1401 Kamehameha Hwy
Ewa Beach, HI 96706

Victor Gonzales, President
Ewa Village Homeowners Association
cbo Certified Management Inc.
3125 Koaana St
Hauula, HI 96719

Ewa by Century Community Association
91-1705 Kanapu Dr, Unit A
Ewa Beach, HI 96706

Pastor James Reid
Friendship Bible Church and School
91-130 Honio Rd
Ewa Beach, HI 96706

George Kekaiwal, President
Hawaiian Civic Club of Ewa
2560 Aikihi St
Honolulu, HI 96819

Robert Yachtman, President
Hawaiian Railway Society
P.O. Box 60309
Ewa, HI 96706

David Scott
Historic Hawai`i Foundation
P.O. Box 1558
Honolulu, HI 96825

Mr. Kunori Nishida
Iku Melema Me Kupuna O Hawai`i I Kei
P.O. Box 190
Hilo, HI 96722-0190

Immaculate Conception Church
91-1298 Waimanalo Rd
Ewa Beach, HI 96706

Sam Schwab, Principal
Laie's Baptist Church and Schools
91-1219 Waimanalo Rd
Ewa Beach, HI 96706

A. Van Hon Diamond
Gale Island Board of Directors
1523 Frelonia Way
Hanauma, HI 96703

Our Lady of Perpetual Help Church
91-1004 North Rd
Ewa Beach, HI 96706

Roger Evans, President
West O`ahu/Ewa Homeowners Association
cbo First Hawaiian Bank
800 Bethel Street, Suite 611
Honolulu, HI 96813

West O`ahu Fairways Community Association
Aana Dr
Ewa Beach, HI 96706

West O`ahu Villages Elderly
91-1472 Renton Rd
Ewa Beach, HI 96706

Sent by Federal Highway Administration:
Office of Hawaiian Affairs
711 Kapahulu Blvd, Suite 540
Honolulu, HI 96813
June 1, 2004

Pat V. Phong, P.E.
Transportation Engineer
State of Hawaii Department of Transportation
Hawaii State Capitol
State of Hawaii
P.O. Box 4152
Honolulu, HI 96204

RE: Request for Section 106, National Historic Preservation Act Consultation for the
North Kohala Road and Kapolei Parkway Projects, Oahu – HEC-III

Dear Pat V. Phong,

The Office of Hawaiian Affairs is in receipt of your May 7, 2004, request for comments on the
above project. We offer the following comments:

As noted in your letter, the State Historic Preservation Division, Office of Hawaiian Affairs, is
responsible for ensuring that the historic and cultural sites of the area are protected.

The Kapolei Parkway Project involves extensive development of the area, including
construction of new roads and bridges. These projects may impact historic and cultural
sites, and it is important to identify and assess the potential effects of these projects
on historic and cultural resources.

We encourage you to consult with local Native Hawaiian organizations to ensure
that the needs and concerns of the community are addressed.

Sincerely,

Cheryl N. Kanuha
Program Manager
July 21, 2004

[Doc attached but]  

Dear [Name],  

Subject: North-South Road and Kapolei Parkway Project  

The Federal Highway Administration (FHWA), the State of Hawaii Department of Transportation (HDOOT), and the City and County of Honolulu (City), intend to construct the North-South Road and a portion of Kapolei Parkway from North-South Road to Renton Road (see enclosed map). Parsons Brinckerhoff is the project consultant on this project.  

The purpose of the project is to improve the transportation network in the Ewa Plain and provide additional roadway capacity to meet existing and future transportation demands. A Draft Draft Environmental Assessment (DEA) prepared pursuant to Chapter 343 of the Hawaii Revised Statutes (Hawaii's environmental impact statement law) is being released for public review. Public comments on the DEA are being accepted until August 20, 2004. An Environmental Assessment complying with federal requirements is also in preparation.  

Federal law requires that implementers of projects with federal participation consult with interested parties regarding potential impacts to historic properties, which include archeological sites, historic buildings or structures, and traditional cultural properties. At the Oahu Island Council Hearing on July 14, 2004, your name was suggested as a potential contact on such matters. Therefore, we are writing to request your review and comment on the project, particularly from the standpoint of potential impacts to historic properties.  

We have already coordinated with the State Historic Preservation Division (SHPD). SHPD has expressed that they have no archeological concerns with this project, given past sugar cane cultivation uses in the project area, and the lack of any archeological sites according to a 1996 survey conducted for the North-South Road portion of the project, as well as other studies conducted in the area.  

However, SHPD has architectural concerns because the traffic signals proposed at the intersection of Kapolei Parkway and Renton Road would be the first within the historic district of Ewa Plantation Village (State Site 50-60-12-975). The project design team will coordinate with the SHPD to determine the best architectural treatment possible for these traffic signals.  

Please note that you have been added to the project mailing list, and will receive a copy of the Final DEA. The DEA contains copies of archeological and cultural reports completed for the proposed project, as well as copies of agency coordination letters to date.  

If you have any comments or concerns about the project, we ask that you print, sign, and return them by mail or letter correspondence within 30 days of receipt of this letter. If you require additional time to respond to this request, have additional questions, or require further information, please do not hesitate to call me or Ms. Haynie Ormiston at (808) 335-7208.  

PARSONS BRINCKERHOFF GUINDE & DOUGLAS, INC.  
Very Truly Yours,  

[Signature]  

W. Wayne Almeida  
Project Manager  

Enclosures: Project map  

cc: Mr. Pat Phung, FHWA  
Mr. Nelson Sigum, NSCT, HWI HI  
Ms. Faith Miyamoto, City & County of Honolulu, OIS
North South Road and Kepriol Parkway
Section 106 Consultation List 2

Gloria Obriz
91-1179 Puaakawili Street, Apt V
Ewa Beach HI 96706-1925

Henry Chung Wu
91-1091 Hualalei Street
Ewa Beach HI 96706

Arno Eason
94-706 Kokoheo Street
Waipahu HI 96797

Glenn Kono
Alia Sina
30-140 Mauka Road
Waimanalo HI 96732

Ted Iman
91-953 Laiakau Street, Apt A
Ewa Beach HI 96706
Federal Emergency Management Agency
Washington, D.C. 20572

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

To: Mayor of Honolulu
Mayor, City and County of Honolulu
530 South King Street
Honolulu, HI 96813

Re: Review of the Notice of Intent (LOMA) dated November 29, 2000

Dear Mayor Harris,

This notice is to notify the Mayor of Honolulu that the Federal Emergency Management Agency (FEMA) is reviewing the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for your community to assess whether the floods of December 1, 1999, have changed the flood hazard in your community. This notice is to notify the Mayor of Honolulu that the FIRM and FIS report are effective as of June 1, 2000.

As a result of this review, FEMA has determined that the flood hazard in your community has not changed significantly. Therefore, the FIRM and FIS report are not being revised.

The FIRM and FIS report are effective as of June 1, 2000, and are available for public review at the following locations:

- City and County of Honolulu
- H.P. Kubota Library
- John A. Burns Library

Public notice of this review will be published in the Federal Register on October 23, 2000. A copy of this notice is available upon request.

Sincerely,

[Signature]
Director, Office of Planning and Permitting, City and County of Honolulu, and Mr. H. Kubota

[Date]

This LOMA review is to notify you that the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for your community is effective as of June 1, 2000. The revised flood hazard information is shown on the enclosed copy of the FIRM and FIS report, which is effective as of June 1, 2000.

This LOMA also reviews the affected portions of the previously effective FIRM and FIS report that are effective as of June 1, 2000. The map and table listed above and modified by this letter will be used for all flood insurance policies and permits issued for your community.

The following table is a partial listing of existing and modified BFEs:

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing BFE (feet)</th>
<th>Modified BFE (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximately 400 feet downstream of the O.R.L. Railroad</td>
<td>Here</td>
<td>29</td>
</tr>
<tr>
<td>Approximately 50 feet upstream of Resnick Road</td>
<td>42</td>
<td>36</td>
</tr>
<tr>
<td>Approximately 1,000 feet upstream of Resnick Road</td>
<td>42</td>
<td>45</td>
</tr>
</tbody>
</table>

*Referred to the National Geographic Vertical Datum, defined to the nearest one foot

Public notice of the modified BFEs will be published in the Federal Register on October 23, 2000. A copy of this notice is available upon request.

Sincerely,

[Signature]

[Date]
based on knowledge of local conditions and in the interest of safety, may set higher standards for
construction in the SFHA. If the State, county, or community has adopted more restrictive or
comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP
criteria.

The basis of this LOHR is, in whole or in part, a channel modification/brightline project. NFIP regulations,
as cited in Paragraph 60.38(k), require that communities ensure that the flood-carrying capacity within
the altered or relocated portion of any watercourse is maintained. Any provision is incorporated into
your community’s existing floodplain management regulations. Consequently, the ultimate
responsibility for maintenance of the modified channel and brightline with your community.

This determination has been made pursuant to Section 236 of the Flood Disaster Protection Act of 1973
(Public Law 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended
(Titles XIII of the Housing and Urban Development Act of 1968, Public Law 96-413, 42 U.S.C.
0661-1121), and 44 CFR Part 60. Pursuant to Section 1361 of the National Flood Insurance Act of 1968,
as amended, communities participating in the NFIP are required to adopt and enforce floodplain
management regulations that meet or exceed minimum NFIP criteria. These criteria are the minimum
and do not supplant any State or local requirements of a more stringent nature. This includes adoption
of the effective FIRM to which the regulations apply and the modifications described in this LOHR.
Our records show that your community has met this requirement.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO
will be the primary liaison between your community and FEMA. For information regarding your CCO,
please contact:

Mr. Jack Elledge
Chief, Community Mitigation Programs Branch
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 165
San Francisco, CA 94129-1250
(415) 922-7184

FEMA makes flood insurance available in participating communities; in addition, we encourage
communities to develop their own local regulations and prevention programs. Through the Project
Impact: Building Disaster Resistant Communities initiative, launched by FEMA Director James Lee
Witt in 1995, we seek to focus the energy of business, citizens, and communities in the United States
builders, severe storm, earthquake, and wildfire. Hazard hazard mitigation is one effective way
it is planned for and implemented at the local level, by the entities who are most knowledgeable of local
conditions and whose economic stability and safety are at stake. For your information, we are enclosing
a copy of a pamphlet describing this nationwide initiative. For additional information on Project Impact,
please visit our website at www.fema.gov/projectimpact. If you have any questions regarding this LOHR, please call our Help Assistance Center, toll free, at

Sincerely,

[Signatures]

[Enclosure]

CC: Mr. Randall K. Fujii, A.I.A., Director of Planning and Permitting,
City and County of Honolulu
Mrs. Greg H. Hiyakumoto,
Project Manager,
K.L. Tawii Corporation
CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE CITY
AND COUNTY OF HONOLULU, HAWAI'I, UNDER THE NATIONAL FLOOD INSURANCE
PROGRAM

On September 30, 1999, the Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the City and County of Honolulu, Hawaii, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Directorate has determined that modification of the elevations of the flood having a 1 percent chance of being equaled or exceeded in any given year (base flood) for certain locations in this community is appropriate. The modified Base Flood Elevations (BFEs) revise the FIRM for the community.

The changes are being made pursuant to Section 204 of the Flood Disaster Protection Act of 1973 (Public Law 93-331) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XII of the Housing and Urban Development Act of 1968, Public Law 90-448, 42 U.S.C. 4021-4128, and 41 CFR Part 61).

A hydraulic analysis was performed to incorporate construction along Kahili Gulch of a new bridge at South-South Road, and current saddle drainage of channels from Rainey Road to North-South Road and then approximately 50 feet upstream to approximately 150 feet downstream of the O.R.A. Railroad, and an undivided road from North-South Road to approximately 50 feet upstream of the O.R.A. Railroad. This has resulted in the establishment of a regulatory floodway, a decrease in SFHAs, and increased and decreased BFEs for Kahili Gulch. The table below indicates existing and modified BFEs for selected locations along the affected length of the floodway(s) cited above.

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing BFE (feet)</th>
<th>Modified BFE (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximately 500 feet downstream of O.R.A. Railroad</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>Approximately 50 feet upstream of Rainey Road</td>
<td>43</td>
<td>36</td>
</tr>
<tr>
<td>Approximately 2,000 feet upstream of Rainey Road</td>
<td>44</td>
<td>43</td>
</tr>
</tbody>
</table>

*National Grade 0 Vertical Datum, excepted to nearest whole feet

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Directorate must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to establish the floodplain management ordinance of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premiums rates for new buildings and the contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which to file an appeal, through the Chief Executive Officer of the community, that the Mitigation Directorate reconsider its determination. Any request for reconsideration shall be based on knowledge of changed conditions or new scientific or technical data. All interested parties are on notice that until the 90-day period expires, the Mitigation Directorate's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

The Honorable Jeremy Harris
Mayor, City and County of Honolulu
515 South King Street
Honolulu, HI 96813
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<th>CROSS SECTION</th>
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Dear Mayor Harris:

In a letter we sent you on October 15, 2002, you were notified of proposed modified flood elevation determinations affecting the Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for the City and County of Honolulu, Hawaii, as modified in a Letter of Map Revision (LOMR) dated October 15, 2002. These determinations were for Karl Drive from Kamehameha Avenue to approximately 400 feet downstream of the O.R.R. Railroad. The 90-day appeal period that was initiated on November 14, 2002, when the Federal Emergency Management Agency (FEMA) published a notice of proposed base flood elevations (BFEs) in the Honolulu STAR-Bulletin, has elapsed.

FEMA received no valid requests for changes to the modified BFEs. Therefore, the modified BFEs that became effective on February 1, 2003, remain valid and revise the FIRM and FIS report that was in effect prior to that date.

The modifications are pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XII of the Housing and Urban Development Act of 1968, Public Law 92-418, 42 U.S.C. 4031-4128, and 44 C.F.R. Part 61). The community number(s) and suffix code(s) are unchanged by this revision. The community number and appropriate suffix code as shown above will be used by the National Flood Insurance Program (NFIP) for all flood insurance policies and certificates issued for your community.

FEMA has developed criteria for floodplain management as required under the above-mentioned Acts of 1968 and 1973. To continue participation in the NFIP, your community must use the modified BFEs to carry out the floodplain management regulations for the NFIP. The modified BFEs will also be used to calculate the appropriate flood insurance premium rates for all new buildings and their contents and for the second layer of insurance on existing buildings and their contents.

Sincerely,

Michael H. Garey, Acting Chief
Hydromitigation Division
Federal Insurance and Mitigation Administration

cc:
Mr. Randall E. Fujii, A.I.A.,
Director of Planning and Permitting
City and County of Honolulu

Ms. Greg H. Hiyakumoto, Project Manager
KM, Twill Corporation

If you have any questions regarding the necessary floodplain management requirements for your community or the NFIP in general, please contact the Director, Federal Insurance and Mitigation Division of FEMA in Oakland, California at (510) 632-7814. If you have any questions regarding the LOBR, the proposed modified BFEs, or mapping issues in general, please contact the FEMA Map Assignment Center, toll free, at 1-877-FEMA-MAP (1-877-336-2627).
COMMENTS ON
1998 DRAFT ENVIRONMENTAL ASSESSMENT
Mr. Kazu Hayashida, Director
Department of Transportation
660 Punahou Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the North-South Road Project, Ewa, Oahu, Hawaii. The following comments are provided in accordance with U.S. Army Corps of Engineers authorities to provide flood hazard information to the Department of the Army (DA) permit.

a. Based on the information provided, a DA permit will be required for work done in aali Gulch at the road crossings. For further information, please contact Mr. Alex Everman of our Regulatory Section staff at 458-9528 (extension 11) and refer to file number 9500090173.

b. The flood hazard information provided on pages 3-48 to 3-51 of the DEA is incorrect.

Sincerely,

Paul Misue, V.E.
Chief, Civil Works Branch

In Reply Refer To L.132

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
660 Punahou Street
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment for North-South Road, Ewa, Oahu, Hawaii

Dear Mr. Hayashida:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (DEA) for North-South Road, Ewa, Oahu, Hawaii. The project sponsor is the State of Hawaii Department of Transportation (HDO) and the Federal Highway Administration (FHWA). This letter is being prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 (42 U.S.C. 4301 et seq.; 81 Stat. 304) as amended, the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.; 87 Stat. 1414), as amended (ESA), and other pertinent state and federal laws. The Service offers the following comments.

The proposed project involves constructing a 2.8 kilometer (2.0 mile) principal arterial roadway from a future segment of Kapolei Parkway to the H-1 Freeway and an interchange with the freeway. The road will include three vehicle lanes in each direction, a median, and sidewalks on each side of the road. The purpose of the project is to respond to regional land use and economic development needs, meet roadway capacity needs, and meet future transportation demands.

The DEA provides an adequate description of the project, existing resources, and the various alternatives considered, and identifies anticipated impacts to fish and wildlife resources. However, the Service does not provide a complete description of the measures that will be implemented to minimize and mitigate impacts to endangered species found within the project area. The DEA indicates that a Biological Assessment (BA) and Habitat

February 23, 1995

Page 1 of 2

 fiance.
DEA, North-South Road
Ewa, Oahu, Hawaii

Conservation Plan (ICP), we are currently in the process of additional details regarding mitigation measures for Abalone removal. The Service is currently providing technical assistance to the State of Hawaii regarding the State ICP being developed for the proposed North-South Road project and the Koko Kai Master Plan Development Project (Koko Kai MFPD). We cannot assume a finding of no significant impact for the proposed North-South Road project until the

1. The Koko Kai MFPD will not directly impact Abalone removal clusters A, B, C, and D and the North-South Road project will impact a portion of cluster C. Areas scored existing clusters A, B, and portions of cluster C, as a consequence thereof, should be set aside and managed to preserve the wild population of Abalone remnant until a self-sustaining, self-replenishing population is established on Oahu.

2. Establish and preserve a self-sustaining, self-replenishing population of Abalone remnant on Oahu in an area that is sufficiently distant from the North-South Road and Koko Kai Master Plan Development Project areas to avoid negative impacts from the project and promote survival. The historic range of this species on Oahu is not well known, and identification of an appropriate site will require the assistance of biologists and experts. Areas such as Koko Kai, Koko Point, and Koko Kai Naval Station may be appropriate sites. We will be happy to assist in identifying an appropriate area and developing a long-range management plan for this area.

3. Establish a propagation program that will assist in maintaining the genetic diversity and viability of the entire wild population of Abalone remnant until a self-sustaining, self-replenishing population is established in a protected area on Oahu. These activities should begin prior to initiation of the development project to ensure that there is no loss of individual plants. We explain that the cultivation of Abalone remnant is not a substitute for a natural wild population, and is not adequate mitigation for the only known population of this species on Oahu.

4. The Final EA should contain a contingency plan or adaptive management strategy that specifies the actions to be taken periodically if the goals specified above have not been achieved.

5. Also, the Service considers the removal and utilization of the only known wild population of Abalone remnant on Oahu to be a significant issue. Therefore, mitigation measures (e.g., protection and management) should be provided into property. To date, these concerns have not been addressed in the Draft ICP. The Service recommends that the Final EA include the approved ICP.

Within Chapter 6, Anticipated Determination, the DEA incorrectly indicates that through the section

DEA, North-South Road
Ewa, Oahu, Hawaii

...
Dear [Name],

From: [Name]

Subject: North-South Road Draft Environmental Assessment

March 4, 1999

Thank you for the opportunity to review the draft application.

The proposed roadway and related infrastructure with Hi-way in scheduled for completion in the year 2001 and 2003.

The Department of [Department Name] looks forward to the expiring development of the proposed development of North-South Road to facilitate development of the regional community.

If you have any questions, please call [Name] at [Phone Number].

[Signature]

[Name]

Director of Transportation
The Honorable Kau Hayashida, Director
Department of Transportation
State of Hawaii
819 Punchbowl Street
Honolulu, Hawaii 96813

April 8, 1999

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment
North-South Road (Project No. Highway 50-01-0-92)

Dear Mr. Hayashida:

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Control of Position Dust


The contractor should provide adequate measures to control dust from the road areas and during the various phases of construction. These measures include, but are not limited to:

a. Planning the different phases of construction, focusing on minimizing the amount of dust generated and activities, controlling off-site vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;

b. Providing an adequate water source at the site prior to start of construction activities;

c. Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phases;

d. Controlling of dust from shoulders and access roads;

e. Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and

f. Controlling of dust from debris being hauled away from project site.

If you have any questions regarding these issues on fugitive dust, please contact the Clean Air Branch at 586-4200.

Noise Concerns

1. Activities associated with the construction phase of the project must comply with the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in Section 11-46-4(1).

b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-44-4(1)(I).

c. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit as stated in Section 11-46-7(3)(1).

2. Heavy vehicles traveling to and from the project site must comply with the provisions of the Administrative Rules, Chapter 11-42, "Vehicular Noise Control for OHU."

Should there be any questions on this matter, please call Mr. Jerry Harum, Environmental Health Program Manager of the Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Sincerely,

Gary Gill
Deputy Director for Environmental Health
C: CAS KHIQEB
WEST OAHU SOIL AND WATER CONSERVATION DISTRICT

20 January 1998

Mr. Kazu Hayashida
State of Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Hayashida:

Upon reviewing your draft environmental assessment for the (proposed) North-South Road in Ewa, we (the West Oahu Soil and Water Conservation District) have concern about a project of this magnitude proceeding without a full environmental impact statement.

As you are aware, the West Oahu Soil and Water Conservation District (WOSS/WCD) is formed under Chapter 180, Hawaii Revised Statutes. The district encompasses the region from Kahe Alo Stream near Haleiwa to Waiawa Stream in Pearl City to Kamehamea. The five-member WOSS/WCD Board of Directors consists of farmers and ranchers who voluntarily work with cooperators.

We recognize that the Kailua Gulch reseeding is not part of the environmental assessment, it does assume that it would be relocated and did not consider any "built" alternatives to the contrary. We would like to emphasize that significantly altering the region's drainage patterns opens the entire area of the North-South Road.

This recommendation for consideration of not only to whose stormwater runoff should drain, but also to where it should travel from there. In addition, this project must comply with the Coastal Nonpoint Source Pollution Control Program, adopted by the State in 1997 and mandated by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA). The draft environmental statement does not refer to either, and itsulu to make a determination of the former.

First, as outlined in their conservation plan, our cooperators have both structures above your project area to treat runoff from their agricultural fields into the gulch. These diversions have been engineered by the cooperators in conjunction with the US Department of Agriculture's Natural Resources Conservation Service.
Therefore, computation of runoff amounts (and alteration of the natural drainage) needs to take these structures into account.

Second, clay predominates the area. This limits the amount of water that will be absorbed by the land. From what we can ascertain, the infiltration rate of the soil type has not been considered. In addition, region's drainage flows are unclear and uncoordinated - a situation which the project needs to address.

Third, how will Kualo Gulch be connected to itself on the other side of the railroad tracks? At present, plans for the gulch seems to end it on the west side of the tracks. Given both the additional stormwater diverted down the gulch with the construction of the north-south road and the city, there is an even greater need for the gulch to have an outlet at Kahului Beach.

Fourth, this combined agricultural/urban runoff is slated to enter from Kualo Gulch into the Eua Village Golf Course. We are concerned with the potential for severe flooding in the adjacent watershed of Hanaula. This region had severe flooding in November 1996, despite restraints from the West Loch Golf Course. We do not believe that the Eua Village Golf Course has the capacity to absorb all of the runoff from the North-South Road and Kualo Gulch to the event of a "flash" rainstorm. Since the golf course (eventually) drains into Hanaula, it would exacerbate the watershed's flooding problem - a situation compounded by inadequate drainage infrastructure along Farrington Highway and Fort Weaver Road.

Given the above stormwater runoff issues, to which the North-South Road will contribute, we believe the impacts to the region are significant enough to warrant a full environmental impact statement.

Sincerely,

Charles AkTong, Chairman
West Oahu Soil and Water Conservation District

cc: Mr. Abraham Wong (Federal Highway Administration)
February 9, 1999

Mr. Ken Hayashi, Director
Department of Transportation
State of Hawaii
659 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hayashi:

Attention: Mr. Wayne Yoshida, Project Manager

Subject: Draft Environmental Assessment, North-South Rod, Rev.

Thank you for allowing us to review the document. However, we do not have any comments.

If you have any questions, please call Lawrence Higa at 527-6246.

Very truly yours,

[Signature]

Eunice S. Steinman
Acting Director and Chief Engineer

February 17, 1999

Mr. Ken Hayashi, Director
Department of Transportation
State of Hawaii
659 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hayashi:

Subject: Draft Environmental Assessment

North-South Road

This is in response to your memorandum dated January 21, 1999, regarding the Draft Environmental Assessment of the North-South Road Highway Project. We have no objections with the information submitted.

Please note that Hawaii Revised Statutes, Chapter 132, requires that certain types of building plans be reviewed and approved by the Fire Chief prior to the commencement of construction. We recommend that all future construction plans be submitted to the Fire Department prior to review and approval.

Should you have any questions, please call Battalion Chief Charles Watanabe of our Fire Prevention Bureau at 431-7778.

Sincerely,

[Signature]

Aldo A. Carano
Fire Chief

AR/1CJW/30
March 18, 1999

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
880 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Draft Environmental Assessment (EA) For North-South Road – Kapolei

Based on our review, we have the following comments:

1. The documentation in the narrative of the report should specify that the “North-South” Road will be under the jurisdiction of the State Department of Transportation.

2. A schematic design of all intersections with the “North-South” Road should be provided during the early stages of the project, if the City is interested to have jurisdiction over the intersecting streets. These would include Kapolei Parkway and all new developments along the “North-South” Road. The schematic design plans should include roadway cross sections, left-turn storage lengths, lane widths, bicycle facilities, as required, and other design characteristics. Median on City roadway facilities should be 15 feet minimum. All roadways intersecting the “North-South” Road should have provisions for future signalization.

3. A double right-turn box from Kapolei Parkway to the “North-South” Road should be provided to support the anticipated morning peak hour traffic demand. Access to the State’s proposed sports complex, which we understand will be located at the marsh approach and continue into Ewa’s Point, should be included in the design of the intersection.

4. Construction plans should be submitted to the Traffic Review Branch of our office for review and approval.

5. As several places of Ewa’s Point will be lost as a result of the project, incorporating this plan into the highway landscaping should be considered as a mitigation measure to the lost environment.

6. The “North-South” Road will have impacts on the Ewa’s Point Drainage Basin and should be designed to comply with the DP Drainage System policies and principles. The final EA should include a figure showing both the location of the proposed roadway and the 9.3-foot wide drainage easement that will serve as the future alignment of Ewa’s Point.

7. The final EA should include a drainage master plan for the alignment of Ewa’s Point. The master plan shall be in conformance with City drainage standards and regulations. Construction of the “North-South” Road system should not proceed until the drainage master plan has been approved. Also, the Housing & Community Development Corporation of Hawaii’s construction schedule for the Ewa’s Point alignment should be included in the final EA.

8. The project must comply with all City requirements regarding drainage, and during the construction period, all existing standards.

9. A 24-inch, 30-inch and 36-inch sewer line is planned within the “North-South” Road. The final EA should describe how this sewer line will be accommodated within the roadway alignment.

10. The “North-South” Road is planned to be one of the links in the Rapid Transit Corridor which will connect Ewa, the City of Kapolei, and Waipahu. The Future Development Plan (FDP) calls for a light rail way to be served along the “North-South” Road to ensure that a future rapid transit system could be developed. In addition, the D.F. calls for three (3) transit nodes where ridership demand and commercial development will be encouraged to be located on the “North-South” Road.

The “North-South” Road is also planned to be part of the region’s open space network as a greenway and to provide bike paths as part of the region’s bikeway network. The Road should be designed to be consistent with the DP vision and policies for the open space network and bikeway network.

The final EA should address how the preferred alignment will address these DP strategies.

Sincerely,

Mr. Kazu Hayashida, Director
March 18, 1999
Mr. Kano Hayashida, Director

Page 3
March 18, 1999

11. For your information, references to the following City agencies should be changed as indicated below:

    Old                           New

    Department of Land Utilization   Department of Planning and Permitting
    Planning Department              Planning Division
    Department of Housing            Department of Community Services
    and Community Development

Thank you for the opportunity to comment. Should you have any questions, please contact Adin Show-Kim at 527-5349.

Very truly yours,

JANICE BELLVAN
Director of Planning
and Permitting

JHS 39
January 1999

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH KING STREET

February 8, 1999

Mr. Kano Hayashida
Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Mr. Hayashida:

We have reviewed the Draft Environmental Assessment for the North/South Road in Ewa and have the following comments:

Please refer to page 3-11 and note that the Kapolei/Waianae Station, District 8, currently provides police service to the Ewa Region.

Based on the document provided, we have no objection to the proposal. We do, however, anticipate that during the construction phases of the project, road and noise complaints, as well as traffic problems, will have an impact on calls for police services. We may have more comments to offer as the project progresses.

If there are any questions, please call Major Paal Pukulu of District 8 at 574-8906.

Sincerely,

LEE D. DOWRIE
Chief of Police

By EUGENE JUSWAPA
Assistant Chief
Support Services Bureau
BPNAS

January 3, 1999

Mr. K. Hayashi
Department of Transportation
Highway Division
State of Hawaii
533 South King Street
Honolulu, Hawaii 96813

ATTN: Mr. Endhuau

Re: Draft Environmental Assessment (EA) for North-South Road Corridor

Dear Mr. Hayashi,

We would like to be a consultant party for the Draft EA for the North-South Road Corridor. Our major concern is the development of Bailey Point Naval Air Station (BPNAS) after the Navy's military facility ceases to be used. We are concerned with any new or changed transportation facility in the Pauoa vicinity that would impact the BPNAS area.

In our discussions with City Council members, neighborhood board representatives, and State legislators, certain areas were noted as having potential for development near Bailey Point Naval Air Station. We are aware of new projects that will be undertaken to improve Bailey Point Naval Air Station's facilities and augment its operational capacity.

Our primary concern is with the project that will develop the North-South Road Corridor. This new transportation link will be critical for the future development of the Bailey Point Naval Air Station. Our concern is that the development plan will be made to minimize the impact on the environment and any noise or traffic disruption.

Please direct these concerns to the appropriate officials of the environmental assessment. If there are any questions, please call me at 808-523-3342 or information Development Manager, Bailey Point Security, at 808-524-3342.

Properly,

William M. Bose
Executive Director

Wynkooshie, Park & Recreation

January 21, 1999

HAND DELIVERED

Mr. Kenneth Au
Department of Transportation, Highway Division
810 Punchbowl Street
Honolulu, Hawaii 96813

Re: North-South Road Draft Environmental Assessment

Dear Mr. Au,

We appreciate this opportunity to submit comments to the Draft EA for the North-South Road. As the developer of the Ocean Point project (formerly known as Wai Mokii), we are interested in the potential environmental impacts of other projects within the Kaiola Guild Watershed.

According to the Draft EA, the project will be contained in the main drainage basin, and an existing drainage basin will be constructed along the north side of the project, and in particular, the potential environmental impacts of other projects within the Kaiola Guild Watershed.

However, for the Oahu Island project, we are concerned that the project will be contained in its drainage basin. HCIDC and HCIDC, in conjunction with the development of its East Kapolei project, plan to complete and improve Kaiola Guild and provide drainage basins to contain runoff from the North-South Road and HCIDC's East Kapolei project.

During the East Kapolei Master Plan Project approvals, we determined that regional drainage must be coordinated with all of the projects in the watershed. HCIDC, in conjunction with HCIDC, agreed that such coordination of regional drainage improvements is necessary, and confirmed that the East Kapolei project had been designed to ensure the additional drainage generated by the project would not impair adjacent property owners.

HCIDC's proposal application with the U.S. Army Corps of Engineers to relocate Kaiola Guild shows five detention basins along the proposed North-South Road, which we assume have been designed to accommodate all of the increased runoff from both the North-South Road and the East Kapolei project. In addition, all regional drainage improvements within the watershed must...
February 21, 1990

Mr. Abraham Wong
Federal Highway Administration
P.O. Box 50268
Honolulu, Hawaii 96850

Dear Mr. Wong:

Subject: North-South Road, Project No. HWY 6 81-04

Thank you for the opportunity to comment on your September 1990 Draft Environmental Assessment (DEA) for the North-South Road, as prepared by U.S. DOT and the State of Hawaii DOT. We appreciate for the kindness of the State of Hawaii and we did not receive the DEA until late January 1990. Hawaiian Electric's comments are as follows:

1. Figure 2-3 - Typical Sections - shows HECO's alignment and identifies the bike path as "3' Pedestrians and Bikes". This is correct. However, it is not clear how the bike path would be maintained. The proposed right-of-way for the bike path will be maintained as part of the proposed right-of-way for the railroad. This issue should be addressed in the final report. HECO had previously prepared alternative plans for this project. Attached in Exhibit 5 is the North-South Road SLD survey, 5040546. The SLD is based on the land use map and road layout for East Kapolei districts. 021117 and 021125.

2. Attached are several construction attendance reports concerning the project. We have submitted these reports to the Department of Transportation and the Department of Public Works.

HECO shall reserve further comments pertaining to the project. We will provide additional comments as this project moves forward. If you have any questions or concerns regarding this project, please contact Mr. John S. Tsuchiya, Project Manager, or Mr. Robert A. Wong, Principal Planning Engineer.

Sincerely,

[Signature]

Attachments
1. The proposed project will involve some modification to the existing grade. All grading work should be performed such that a minimum 13.8kV conductor to ground clearance of 11.5 feet is maintained at all times. In the design of the 13.8kV alignment, we had planned for a future 45kV conductor. The ground clearance at this span for the 45kV was assumed to be 36 feet at a conductor temperature of the 120 degrees F. Therefore, assuming a grade change of 4%, 13.8kV, the 45kV conductor will continue to remain above the O.D., a minimum ground clearance of 30 feet.

2. Related to the conductor clearance issue, we have some concerns regarding the proposed placement of the streetlight along North South Road. The streetlight place show that the streetlight will be placed along the right of the road right of way. This, for the north bound lane, the streetlight will be directly above the transmission line for a major portion of the alignment. The distance that the streetlight would range from the transmission line would be between 100 to 200 feet. At least a 9 feet clearance is required. To ensure proper G.L. clearance, we need to maintain a minimum 9 feet clearance between the bottom 45kV phase and the top of the structure. For example, assuming a clearance of 9 feet for the bottom 45kV phase, the structure cannot extend a height of 9 feet (2.7m). To mitigate this potential conflict we would recommend that the structure height be adjusted to provide a minimum 9 feet clearance or 10 feet the streetlight standards are relocated to the south side. If relocation is an option, we will have to determine that minimum clearance height at each specific location. The maximum height will be dependent on the transmission voltage and the lowest level of the bottom 45kV phase.

3. In reviewing the proposed drainage plans, we found that road drainage structures will be located relatively close to a few of the 13.8kV poles. We have a concern that, during construction of the underground drainage system, the soils around the conductors will be exposed and the lateral reactive pressures of the conductors may be increased. This would result in the failure of the poles which may cause the power to be lost. Of particular concern are the following poles:

   a. Pole 1: The base of this pole will be located approximately 2 feet from the edge of the driveway.
   b. Pole 2: The base of this pole will be located approximately 2 feet from the edge of the driveway.
   c. Pole 3: The base of this pole will be located approximately 2 feet from the edge of the driveway.
   d. Pole 4: The base of this pole will be located approximately 2 feet from the edge of the driveway.

4. Any equipment used during construction shall maintain a maximum road clearance of 13 feet from the energized conductors.

*Concerns raised by Clinton O. Nomura (343-7612) Electrical System Engineer and Paul Nakagawa (343-7612) Transmission Engineer.

March 6, 1999

Mr. F. Heineken, Director
Hawaii State Dept. of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Heineken:

In response to the January 21, 1999 Draft Environmental Assessment on the North-South Road in Ewa, we have the following comments.

The project of the North-South Road will not affect the Oahu Railway & Land Company (O.R.&L.) historic tracks, as Figure 3-4 shows an extension of Hawaiian Railway Company (H.R.C.) historic tracks, which will be a part of our rail line. Since there will be no interfering construction in that area, it is acceptable.

Our main line from the Museum to Kahe Point crosses about 10,000 feet per year, and is a part of Sunday traffic, but also including special runs during the week. This reference to the historic restoration values of our trains in the next paragraph is appreciated.

Figure 3-3 shows a special 100-year flood area in Kalihi Valley near the Kapolei Park. The figure shows the proposed railroad and railroad bridges which is the main State Park. The flood depth is shown in Figure 3-3 of July 30, 1998. This bridge will pass 8300 ft and reduce flooding.

We have previously reviewed plans for the Kalihi Valley Railroad Bridge and understand that the project has been advertised for bids by the City & County of Honolulu.

Thank you for the opportunity to comment on this assessment. Our point of contact is Ben Solis, at 836-8311.

Very truly yours,

Robert F. Fasman, President
Hawaiian Railway Society
A Copartner of the National Railway Historical Society
P.O. Box 2030, Ewa Station, Ewa Beach, Hawaii 96706
Ph: (808) 681-0411 Fax: (808) 681-0412

The Hawaiian Railway Society is a non-profit educational organization involved in the preservation and restoration of historic railroads in Hawaii.
February 19, 1999

Mr. Kana Hayashi
State of Hawaii
Dept. of Transportation
801 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Hayashi:

Subject: North-South Road - Draft Environmental Assessment

Thank you for the opportunity to review and comment on the draft environmental assessment document for the Proposed North-South Road. We have no comments to add to your document at this time.

If you have any questions or require assistance in the future, please call me at 848-1447.

Sincerely,

Paul Hamano
Design - Associate Design

A part of GIE Corporation

March 11, 1999

Mr. Kana Hayashi
State of Hawaii
Dept. of Transportation
801 Punchbowl Street
Honolulu, HI 96813

Re: Draft Environmental Assessment - North-South Road Project HFWY-0-01-92

Dear Mr. Hayashi:

We have reviewed the above-captioned document, which was received on February 6, 1999, and would like to offer the following comments:

1. Section 1.2 - Project Purpose and Need: It appears that, in assessing regional transportation and economic development needs, the primary focus was on accommodating the travel demand and traffic volumes associated with the region’s continued growth and employment growth. Since only cursory mention was given to the reevaluation of Barking Point (BFPAS), the West Oahu campus of the University of Hawaii, and the State of Hawaii port complex, it is unclear if any consideration was given to the anticipated traffic demands generated by students, academic, recreational groups, airport users, and spectators attending to the three major sporting venues planned for the region. An example of the potential magnitude of the impact from these developments is in the recently announced Hawaii Super Bowl, which is expected to attract 70,000 to 100,000 paying spectators to Barking Point this fall.

2. Section 2.1.3.1 Roadway Network Assumptions: Although a conceptual New Development Road and an existing Pelican Road were included in the assumptions, the planned road linkages for the BFPAS reevaluation were not, such as the connection of South-South Road to Coastal Road, Triolo Road to the Waiakeha Roadway System, Sanding Inlet Road to Saddle Road, and Leilehua and Hoapili Avenue to the City of Kapolei master network. Additionally, the plans for BFPAS do not include widening Fort Banneker to four lanes from Hoomaluhia Ave to Kapolei Parkway.

3. Section 3.1.2.1.4.1 Description of Preferred Alternative: Despite the assumption of key TOD actions recommended in the OHTP, such as an integrated TOD and park-and-ride system for the West Oahu area and the inclusion of bike lanes, it is surprising that the preferred alternative is still a general purpose lane - no HUV and no bike lanes. In fact, the incorporation of bike lanes was not even addressed.

94-320 Waialua Depot Road, #407 - Waialua, Hawaii 96797
Telephone Number (808) 637-3235 - Facsimile Number (808) 674-6741
4. Section 2.2.2.2 Arterial with HOV Lanes or Busway: The estimate for eliminating the HOV alternative, which would reserve two of the six lanes for high-occupancy vehicles, across the right, particularly when it would be "compatible with the long range future transportation plan." It appears that the upgrading determined in his decision was the high cost of an interchange configuration necessary to link the H-5 Road HOV lanes with HOV facilities on the H-3 Freeway. Doesn't this decision foreclose the only opportunity to design and implement a direct HOV connection that can further the GRTP's goal for an integrated HOV and park and ride system for the Ewa area? And, in view of the major activity centers planned for the area, a direct HOV linkage between the North South Road and the H-1 would be particularly advantageous in facilitating the accessibility and efficiency of public transit services in the Ewa area.

5. Section 2.2 Interchange Alteratives: It is stated that the evaluation of interchange alternatives were based on traffic operations, right-of-way requirements, and cost. Was any consideration given to the ability to further long-range system design goals? Both the Koola and Makaha interchanges are examples of conventional designs which have become inadequate to handle the demand, thereby requiring costly redesign and causing major traffic impacts during the construction period. Would it be prudent to plan to handle the region's continued growth from the beginning?

In summary, we are disappointed that the recommended build alternative does not propose to implement any TDR strategies recommended in the GRTP.

Sincerely,

[Signature]

[Name]
Executive Director

c. Ewa Region Transportation Master Planning Group
c. Oahu Metropolitan Planning Organization

---

PUBLIC COMMENT: NORTH/SOUTH ROAD CORRIDOR, 'EWA

March 11, 1999

Glenn J. Qamida
91-812 Kamehameha Avenue
Wai'anae, Hawaii 96792

MR. ERNST ET AL.
Department of Transportation, Highway Division
855 Kamehameha Avenue
Honolulu, Hawaii 96813

SUBJECT: THE NORTH/SOUTH ROAD CORRIDOR STUDY: DRAFT ENVIRONMENTAL ASSESSMENT: CHAPTER 2

Mr. Ernst, Mr. Kenneth An,

My name is Glenn Qamida. I presently reside in Ewa Beach; a community along the 'Ewa community is the oldest on the 'Ewa district. I am active in the community, serving on numerous boards and organizations. I was born and raised in Waipahu on the sugar plantation, coming from a family of over three generations of sugar workers with combined years of over a century of sugar employment. I had seen changes in Waipahu during my childhood years, yet I am still witnessing even more drastic population and physical transformations in the area now in my adult life. Like Waipahu, 'Ewa Beach has been a tremendous amount of population growth and physical changes in the surrounding areas and will soon experience it's own physical transformation.

In 'Ewa Beach, one of the real ongoing nightmares effecting the residents' 'well-being' and 'life-style' is traffic. Being at the end of the road, with only a one-way-in and one-way-out, and without an innovative comprehensive plan for population growth, development, and construction, traffic along the Ewa Freeway has increased and American at a phenomenal rate. From the point at which the Ewa Freeway reconnects to the H-1 Freeway, roughly 10 miles (16km) to the top of the city for every traffic signal, there are present on the H-1 Freeway, roughly one every half mile. And to top it off, segments of the city for more traffic signals are still being built. I have, for a long time, been an advocate against the "growth that affects the "well-being" and the "quality of life" of individuals living in the community. For the past fifteen to 20 years, I have been advocating for a north/south road; a straight, alternate, reliever road, within...
legal limits paralleling Port Hueneme Road to the I-101 Freeway. But as none of us in the community have seen, housing and more, has impacted a straight "true" route to the I-101 Freeway. I simply feel that an alternate north/south road is the real solution.

As you have been involved in the land use planning process for the 'Ewa Plains, one of me major concerns is the development of the community. Our concept for housing, a preservation district, along with a golf course, has impeded a straight "true" route to the I-101 Freeway. I simply feel that an alternate north/south road is the real solution.

I have been involved in the planning process for the 'Ewa Plains. We have been working with community leaders and developers to plan for the future. Our concept for housing, a preservation district, along with a golf course, has impeded a straight "true" route to the I-101 Freeway. I simply feel that an alternate north/south road is the real solution.

Mr. Au, I would like to comment on Sub-Alternative "A". This is the proposed route for the north/south road in the community. Our concept for housing, a preservation district, along with a golf course, has impeded a straight "true" route to the I-101 Freeway. I simply feel that an alternate north/south road is the real solution.

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Thank you for letting us speak and express our opinions on this important issue. As the landowner and developer, I would like to comment on Sub-Alternative "A". This is the proposed route for the north/south road in the community. Our concept for housing, a preservation district, along with a golf course, has impeded a straight "true" route to the I-101 Freeway. I simply feel that an alternate north/south road is the real solution.

P<span>esently submitted:

[Signature]
Dear Mr. Hayashi:

Subject: Draft Environmental Assessment (EA) for North-South Road, Ewa

A thorough discussion of the cumulative impacts on the North-South Road from the relocation of Kailua Gulch is missing from the draft EA. The discussion included on these impacts is brief and responsibility for their mitigation is assigned to HIPO. The EIS law requires a full discussion of cumulative impacts "regardless of what agency or person" undertakes past, present and reasonably foreseeable future actions, as noted in section 4.1.2 of the EIS.

Section 3.7.2 of the draft EIS also mentions the formation of the Kailua Gulch Task Force regarding the hardening of former stormwater retention areas in Ewa. The rerouting of Kailua Gulch necessitates modification of natural drainage pathways that begin in the Waianae Mountains. There are safety concerns attached to all major highway systems in this region that can be adversely affected by such modifications.

This section also states that the Gulch will be realigned prior to the proposed construction of North-South Road, and that the new alignment and added mitigation will mitigate the effects of 100-year floods. Regarding this, I have the following questions:

When was the Task Force formed and to what extent will it provide assurances concerning the safety of highway system users? To what extent will DOT be responsible for the safety of users in the event that highways are overwhelmed by flooding during extreme storms events and planned mitigation measures do not fully control impacts?

If you have any questions, call Henry Heishin at 586-4185.

Sincerely,

Amy Ogi

Att: Kenneth Au

March 3, 1999

Mr. Kazu Hayashi, Director
Department of Transportation
State of Hawaii
699 Punchbowl Street
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment for the North-South Road, Ewa, Hawaii, Project

March 3, 1999
Mr. Kazu Hayashi, Director
Department of Transportation
State of Hawaii
699 Punchbowl Street
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment for the North-South Road, Ewa, Hawaii, Project

March 3, 1999

Dear Mr. Hayashi:

Thank you for the opportunity to review the draft Environmental Assessment for the North-South Road project in Ewa, Hawaii. The State of Hawaii Department of Transportation and the Federal Highway Administration are proposing to construct a new north-south road and a new interchange with the H-1 Freeway near the Villages of Kapiolani and the future University of Hawaii West Oahu Campus.

The Office of Hawaiian Affairs has no concerns with the concept of the proposed project. However, the project will impact a colony of endangered Kiiwaiwai (cetaceans called toothed whales). The mitigation proposed for this impact is to remove approximately twenty Kiiwaiwaiplaints from the highway corridor and attempt to propagate them in a nursery setting.

The DREA has raised concerns over the proposed project. They have stated that a Conservation Plan must be worked out with the U.S. Fish and Wildlife Service (Service) after the completion of Biological Assessment. The Service has been required to propose a Conservation Plan containing the effect of the proposed highway on the plants which will remain within the highway corridor except to the extent that a level of care plan is prepared. Of key importance is how the remaining Kiiwaiwai can be expected to adjust to the impacts of automobile emissions.

Sincerely,

Wayne Yasui, Director
Office of Hawaiian Affairs

Date: March 3, 1999

Attach: Draft Environmental Assessment for the North-South Road, Ewa, Hawaii, Project

March 3, 1999

Mr. Kazu Hayashi, Director
Department of Transportation
State of Hawaii
699 Punchbowl Street
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment for the North-South Road, Ewa, Hawaii, Project

March 3, 1999

Dear Mr. Hayashi:

Thank you for the opportunity to review the draft Environmental Assessment for the North-South Road project in Ewa, Hawaii. The State of Hawaii Department of Transportation and the Federal Highway Administration are proposing to construct a new north-south road and a new interchange with the H-1 Freeway near the Villages of Kapiolani and the future University of Hawaii West Oahu Campus.

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Sincerely,

Wayne Yasui, Director
Office of Hawaiian Affairs

Date: March 3, 1999

Attach: Draft Environmental Assessment for the North-South Road, Ewa, Hawaii, Project
Mr. Kazu Hayashida, Director
Department of Transportation
March 3, 1999
Page two

The DSA states that the plants taken from the sight-of-way will be cultivated in an off-site botanical garden. Again, this is insufficient. While it may be reasonable to have plants in a botanical garden, it is more important to protect endangered plants in their natural setting. We would like to see mitigation measures which describe how the DOT will encourage, enhance and protect the plants that remain in the highway corridor.

Agata, thank you for the opportunity to review this document. If you have any questions, please contact Lyne Lee, EIS Planner at 94-1306.

Sincerely

Celia Kippen
Deputy Administrator
cc: Board of Trustees

23 March 1999
Kazu Hayashida, Director
Department of Transportation
860 Punchbowl St
Honolulu, HI 96813

Re: NORTH SOUTH ROAD DRAFT ENVIRONMENTAL ASSESSMENT

The Draft Environmental Assessment for the construction of the North-South Road says that construction of the road will have both direct and indirect impacts on an endangered plant colony with 61 individuals (p. 4-39). The DSA indicates that DOT is in the process of preparing a Habitat Conservation Plan to allow for the taking of these species.

Please note that Hawaii's Administrative Rules, 11-200-12 state in pertinent part: “In most situations, an action shall be determined to have a significant effect on the environment if it substantially affects a rare, threatened, or endangered species, or its habitat.” Moreover, because the construction of roads is generally associated with traffic generation and development, the project involves substantial secondary impacts.

An EIS should fully define what will happen to the endangered species and how construction of the road will increase the likelihood that the species will suffer. It should also more carefully assess the impact on its habitat. We look forward to studying the Draft Environmental Impact Statement because it is not obvious that the project will have a significant impact on the environment.

Yours,

Jeffrey Mikilina
Director

cc: Director, Office of Environmental Quality Control
Dear SEE ATTACHED LIST

Subject: North-South Road, Ewa, Oahu, Project No. HWY-O-01-92
1998 Draft Environmental Assessment

Thank you for your comments on the Draft Environmental Assessment for the proposed North-South Road in Ewa, Oahu. This Draft EA was circulated in September 1998 and several significant events have since occurred.

Our event was the discovery of an endangered plant species, the Ahainu Manania, a type of ferns along the proposed highway alignment. It has taken several years to resolve this issue, because it is a Federal and State protected species. This process was concluded in April 2004, when the State Board of Land and Natural Resources approved a habitat conservation plan (HCP), that will result in a net gain for this species, while allowing the proposed North-South Road to proceed.

Another critical event involved our decision to extend this project, to include a section of Kapolei Parkway, from Rabbit to the North-South Road intersection. The primary basis for this decision related to the requirement to complete both the Kapolei Parkway section and the North-South Road within the same relative time period. Consequently, with the completion of the environmental and planning process, the City and County of Honolulu (City) can continue its efforts to design and construct this section of Kapolei Parkway.

RICHARD J. SLATTERY
Director of Transportation

Page 2 JUL 21 2004

To accommodate the above-mentioned changes/conditions the Revised Draft EA (2004) will supersede the 1998 document. The Revised Draft EA is to be issued shortly. Your previous comments on the 1998 document were considered in the preparation of this new document.

You will receive a copy of the revised Draft EA for your review and comments. In addition, copies of the new document will be made available at public libraries and the Office of Environmental Quality Control.

We encourage your continued involvement in our planning process. Comments on the revised Draft EA will be due on August 22, 2004. We believe that the Final EA for this project will be issued in September 2004 and this document will address all comments received on the revised Draft EA.

If you have any questions or require additional information, please contact Ronald Tsuchi at 587-1830 or email at ronald.tsuchi@hawaii.gov.

Very truly yours,

RICHARD J. SLATTERY
Director of Transportation
PUBLIC HEARING
NORTH-SOUTH ROAD & KAPOLEI PARKWAY

Wednesday, September 1, 2004
6:00 p.m.
Ailing Park Meeting Room #1

(Transcript of meeting)

BEFORE: BARBARA ACORD, CSR No. 412, RPR
Notary Public, State of Hawaii

MR. HAYAGA: Thank you all for coming this
evening and, let's see. Let's take care of a little bit
of housekeeping before I do all of the things. The
restrooms are out there in the second building, and we
have refreshments in the back. Please help yourselves.
It's a rather warm evening.

Again, I'm back in the same room that we did
the previous hearings and glad to be back. My name is
Rod Hayaga. I'm the Director of Transportation for the
State of Hawaii. It is now 6:09, and I declare this
public hearing to be officially open. This is the
public hearing for the North South Road and Kapolei
Parkway project.

Before we begin, I would like to
introduce others that have been involved with the
project. Tonight we have present Representative Mnoes,
Mark Moses, there he is. And then from the neighborhood
board, Tonch Malama of the Ewa Neighborhood Board. And
Representative Mnoes Minda just walked in. We do have
the consulting firm in Parsons Brinckerhoff and the K.N.
Towll company, along with a number of State staff and
my famous guy over there, Scott Ishikawa.

Some of you may remember that we were actively
pursuing this project in the late 1990s. However, we
encountered an endangered plant species in the roadway
alignment and it has taken some time to address the
issues that resulted. At this point, we have full
approval from the U.S. Fish and Wildlife Service and the
State Department of Land and Natural Resources to
proceed with the roadway.

The public hearing is being held for several
reasons. First, this is a means of informing you of the
current plans of the State Department of Transportation
and the City’s Department of Transportation Services.
Our intent is to inform you how you may be affected
either beneficially or adversely by the proposed
project.

Secondly, we want to obtain facts that may not
have been previously brought to our attention in
connection with the location and design of the proposed
project. A Revised Draft Environmental Assessment, or
an EA, of the project that complies with the
requirements of the State law, Hawaii Revised Statutes
Chapter 343, was formally noticed in the Oahu notice on
July 23rd. The comment period for this Chapter 343 EA
was originally supposed to end on August 23rd, 2004, but
it has been extended to September 16th, 2004.

Another environmental assessment prepared for
the project in compliance with the Federal law, the
National Environmental Policy Act, called NEPA, will be
released soon. The comments received tonight are being
accepted for the State’s environmental review process
under HRS Chapter 343.

HDOF and the City BTS anticipate that the
proposed project would not have significant adverse
impacts on the communities or the environment in either
the long or short term. Therefore, we intend to issue a
Finding Of No Significant Impact, called a FONSI, on
this project which would allow the project to proceed to
the final design, permitting, and construction phases.
If you do not want to provide any comments
tonight, but would like to comment later before the
September 16th deadline, I’ll be providing information
on how to submit your comments shortly.

Talk a little bit about the format of this
particular public hearing. The project description.
First, I’ll provide a brief description and background
of the North-South Road and the Kapolei Parkway project.
At about 7:15, or let’s see, let’s make it 7:20, we will
break for a 15-minute recess. During this time I
encourage you to view the various display boards
situated right outside in the foyer there, talk to the
project team, and have some refreshments in the back.
The restrooms, again, are located outside behind in the
second building.
At about 7:30 our formal public testimony session will begin and will continue until everyone who has signed up to provide testimony has spoken.

Finally, I will close the meeting with a few remarks. And we -- just walked in Cheryl Soon, the Director of Department of Transportation. Hi, Cheryl.

Testimony cards are in the sign-in table in the back. If you're interested in providing oral testimony to the group, please fill out an intent to provide testimony card, this blue card. Some of you may have filled out this card when you arrived. Indicate your name in the imprint on the card and turn it in at the sign-in table back there. We will be accepting testimony cards throughout the evening. So if you did not put in one initially, please do not hesitate to do so later. You will be called up in the order that the cards are received, except for elected officials who will be given the courtesy of going first. When you're called, please come up here to the podium.

To ensure that everyone has a chance to speak, there will be a three minute time limit on providing testimony. If you are not done providing testimony, please indicate so and your card will be placed behind those who have not yet spoken and then you may speak after we have gone through the first round of testimonies.

I would like to emphasize that this hearing is to provide public testimony on the project. Please do not interrupt the person providing testimony or ask them questions while they are testifying. All testimony is being transcribed by a court reporter and a formal transcript of these proceedings will be prepared. Every comment will be addressed in the Final Environmental Assessment report. Any questions you have on the project may be asked after the formal meeting is concluded.

For those of you who would like to provide testimony and comments on the project but have to leave, or who would prefer not to speak up here using the mic, we are providing other means to provide testimony comments. The court reporter, located just outside the entrance and right there in that lighted room back there in the foyer is another court reporter. Please feel free to provide your comments about the project to that court reporter privately at any point during this hearing. These comments will have the same importance as comments made in front of the group and will also become part of the hearing transcript.

At the sign-in table in the back we are providing comment forms. Please provide your comments.
Kapolei Parkway ultimately will be a six-lane wide and
will be able to accommodate three lanes of traffic in
each direction separated by a raised landscaped median.
Sidewalks will be provided on both sides of the roadway.
North-South Road will also have a 10-foot paved outside
shoulder, and these are described in the plan that are
outside the foyer there. A bike facility will be
provided on the east side of the North-South Road and
the mauka side of Kapolei Parkway within the road’s
right-of-way.

The center median of this North-South Road is
reserved for future rapid transit corridor. The future
rapid transit corridor preserves options for transit
service improvements for the Kwa-Kapolei community and
other planned developments such as the University of
Hawaii’s West Oahu campus.

The project also includes drainage features
such as drainage canals and detention basins to handle
drainage associated with the proposed North-South Road.
Two culverts will carry the North-South Road over the
existing Kool Gulch.

In the construction phase, the interim phase of
the project consists of constructing the North-South
Road and the H-1 interchange, westbound off-ramp, and
eastbound on-ramp, and three lanes of the North-South
other planned developments such as the University of
Hawaii’s West Oahu campus.

The center median of this North-South Road is
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service improvements for the Kwa-Kapolei community and
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The project also includes drainage features
such as drainage canals and detention basins to handle
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Two culverts will carry the North-South Road over the
existing Kool Gulch.

In the construction phase, the interim phase of
the project consists of constructing the North-South
Road and the H-1 interchange, westbound off-ramp, and
eastbound on-ramp, and three lanes of the North-South
Road and the Kapolei Parkway. The construction schedule. The final design of
the project will be completed in October of this year. When a POMI, or the Finding of No Significant Impact,
is obtained, the project will be advertised to the contractor. We are anticipating that this will occur in
late October. Construction of the initial phase of the North-South Road is scheduled to begin early in
January 2005. Construction of the interim phase of the Kapolei Parkway will begin thereafter. Both facilities
are expected to be open for service in late 2007 and 2008.

The North-South Road and Kapolei Parkway will increase mobility and reduce delay on Fort Weaver Road
and Fort Barrette Road corridors by decreasing traffic in these two corridors. Increase mobility within the
Ewa plain by completing key pieces of the roadway network. It will maintain accessibility to the Ewa
region by reducing bottlenecks at the Koolia and Makakilo interchanges. And increase flexibility for future
regional and local transit routes through new interchange access at H-1 freeway, a more complete
roadway network, and space for a future rapid transit corridor.

Again, the comment period for the Revised Draft

Environmental Assessment ends on Thursday,
September 16th, 2004. Public testimony received this
evening and during the remainder of the comment period
will be documented and addressed in the final EA.

Thank you for your attention, and now we'll
have a 15-minute break before we start -- let's eat,
let's make it a 10-minute break before we start public
testimony. And as a reminder, if you are interested in
providing testimony, please fill out the intent to
provide testimony, the blue card, located at the sign-in
table in the back. Also at the sign-in table are the
project fact sheets and comment sheets. The court
reporter in the foyer is ready to note down any comments
that you may have at this point. So we're gonna take a
break, and before I do that, I would like to introduce
Senator Willie Espino. Senator, welcome. So with that,
let's take a 10-minute break, for those of you who want
to get introduced to the project outside and we have
staffers there to answer questions.

[Off the record at 7:21 p.m.]
[Back on the record at 7:33 p.m.]
MR. HARAHA: Okay. Again, the rules that we've
set up for this public hearing is you will have three
minutes. I will let you know when you have 30 seconds
left. The reason why we're gonna be very strict on the
three minutes is we have 40 people testifying tonight.
That's at least two hours and that's not counting going
ing up and down. So if you want to speak more than three
minutes, we're gonna put you at the end, but right now
we do have 40 cards for folks who want to speak.

And as I promised, we're gonna have Senator
Willie Espero. Okay Senator, if you'd like to come up
and testify, please.

SENATOR ESPERO: Thank you, Director Haraga,
for coming out to Ewa Beach and also Director Soon from
the City and County. On behalf of the people of Ewa
Beach, Ewa Villages, I'd like just state my complete
support for the North-South Road and everything you're
doing. I've been the senator for this district now for
two years and representative for three years and the
biggest issues out here, as we all know, are traffic and
education, and this is a project that everybody
supports.

I know there's been some discussion regarding
which way it would go, but at this point in time the
route that has been chosen appears to be the best route.
Any changes to that route would just cause delays in
time and cost us more money, but this area is the
fastest growing region on Oahu between Gentry homes and
the Makaha homes. Approximately 700 to a thousand now
homes are being built and people are utilizing Fort
Weaver Road. Right now Fort Weaver Road is at over
capacity in the morning. It is just too small for what
we have and the North-South Road will be a major, major
relief road, a major regional road for Ewa Beach and for
Kapolei. The Fort Weaver Road widening also will assist
in the problems that we have now, so that by early 2007
I expect, and the community does expect, major relief on
Fort Weaver Road.

This is a project that has been discussed for
25 years, from what I've told. I've lived here for 15
years and each year I've seen the traffic get worse and
worse, and finally the Government is catching up where
they should have been doing more work probably five or
10 years ago. And it's not gonna be changed overnight,
but we certainly appreciate all that you are doing.

This road will also assist in building UI West
Oahu. This is a four-year institution which is lacking
in our region. This will be an opportunity for more
children in our district to go to a university versus
having to drive into the traffic every morning towards
Manoa.

I'd like to make a suggestion that when
landscaping does occur on this roadway, that you do
consider the red ilima, the endangered plant, and see if
Mr. Haraga: Thank you. Senator. For those of you who did not get the information, there is a larger map version in the back. Some of us old folks can’t read that well. And again, there is a court reporter in the other room for those of you who don’t want to come up here and testify. You can go to that other room in the back and go one-on-one with the court reporter.

I'm gonna start calling up the people. The people that signed in first will go first. Patrick, I believe. Hange. Patrick.

Mr. Hange: Good evening. My name is Patrick.

Ralph Rosenberg Court Reporters
Honolulu, Hawaii (808) 524-2690
open forum here tonight to hear our testimony and ideas regarding this very important and much needed secondary road for our growing community. I look forward to working with you, Rod and Scott, at the neighborhood board level to complete our connection with other communities for one purpose, and that is to move forward and put our past differences aside. Thank you.

MR. HABAGA: Thank you, Tony Becker. Tony.
MR. BECKER: Again, my name's Tony Becker and I'd like to, again, thank the Director for coming out this evening and all the other representatives who are here this evening supporting this project. My concern, or my issue, is simple. I would like to see a contractor be given an award for getting this project done early. As they are doing with the H-1 project. Anybody who's looked at the Fort Weaver Road project in comparison with the H-1 project, which started at the same time, we've moved dirt and they have a wall built. So I'm looking at possibly awarding some extra money for getting this project done early. Thank you very much.

MR. HABAGA: Lyle Malvernon, Lyle.
MR. MALVERNON: Hi, my name's Lyle Malvernon and I fully support the North-South Road and the Kapolei Parkway. I got a couple things I think we need to work on, though. One is the Geiger Road and Kapolei Parkway.

We need a stoplight there now.
Also, on the Kapolei Parkway between Haseko and Gentry, there's a small portion there that doesn't belong to either one of them and on your map here it doesn't show who's going to build that.
And also on the North-South Road, when you're looking at it, we should drop it down from -- right down to Roosevelt Road. That would ease up traffic pull in a couple different ways there.
And the other issue that I got in your landscaping should be plants that don't take much water, don't take much maintenance, because they don't do very good on Fort Weaver Road. So I wouldn't expect any plants in this area to be maintained very well neither. That's all I have. Thank you very much.

MR. HABAGA: Thank you. Glenn Omalida.
MR. OMALIDA: Aloha everybody. Good evening. My name is Glenn Omalida. I live in Ewa Beach, and I've been a resident of this area for the last -- born and raised on the sugar plantation, Wai'ehu sugar plantation right down the street, and now I live in Ewa Beach. So I've been around a long time.
What I'm gonna do tonight is talk about two specific things. One, about the North-South Road, and I yielded my other half at the end to talk about the
My testimony was already submitted and it's in the EA, the revised statute of the EA, but let me go through the history of this North-South Road. Back in the '90s, I don't know if you guys remember that the Government wanted to move everybody west. So the Government said, let's build a second city, as simple as that. Which meant that population growth would move from town to the Ewa area, to the Kapolei area. So they said Kapolei is the second city, right. You know logical sense. In the logical thinking, population should never go back to town. That's the mind set of politicians and the Government today. They want a rapid transit system that goes back to town. They say they wanna widen the roads so that everybody gets out of town. They want this so everybody can converge to the North-South Road and head on to town. Is that a concept of what?

I think the Government -- if you look at Government, they have screwed the public royally. Population isn't -- jobs isn't coming down here, as you can tell. Everybody's going back to town. We had a proposed -- the North-South Road was a concept of the Ewa Beach community 20 years ago. Two tsunami we had experienced in Ewa Beach gave us the idea that we need a North-South Road out of Ewa Beach. Here's Fort Weaver Road right here. Here's the other road. We wanted a road that would parallel Fort Weaver Road all the way to the freeway within the Federal guidelines, which is a one mile between off-ramp. But what happened, we got a golf course over here and we got a storage center over here. Three minutes?

MR. HABADA: Yeah, three minutes. We have Louis Maria of Varano Village.

MR. MARIA: Hi. My name is Louis Maria representing the people of Varano Village. For many years now I have been working with them, and as I look at this North-South Road, as long as it does not do anything to hurt the people of Varano Village, as long as it doesn't interfere with their lives or isolate them in any way from any of the other historical villages, I can see nothing wrong with this. I know Glenn was saying a historical area. At one time Glenn was part of that. He was part of the Friends Forever, if I'm not mistaken, weren't you, Glenn?

MR. GAMIDA: Never. I wasn't in that organization, Louie.

MR. MARIA: Well, my apologies. I was told different by somebody else. But, you know, as long as they don't hurt, take away housing from these people, I
can see nothing wrong. This will give us another way
out of Ewa, a faster way. I know because I go to town
just about every day to see my wife in a nursing home,
so I know what the traffic is like. But I see nothing
wrong with going back the other way and coming back
around. Thank you.

MR. HABAGA: Thank you. Okay, Layne Nakela,
Layne Nakela. Might have done it over there. Remember
we have the other area in the back if you want to do it
over there. Yash Malama, concerned citizen. Tes.

MS. MALAMA: Aloha everyone. I speak in favor
of the current alignment for the North-South Road and
Kapolei Parkway. I have some major concerns, though, on
the section where it impacts Kenton Road, so as we cross
from Maliku to Kenton Road, so I'm happy I seen Cheryl
Soon, that we're gonna have to upgrade Kenton Road along
that particular area, the entire area of Kenton Road
because it's gonna be a major intersection. I did not
see any discussion about that in the EA and how it's
gonna impact the current Kenton Road and intersection
between Kapolei Parkway and Kenton Road.

Also the intersections between Kolowaka,
because now Kolowaka is gonna be a thoroughfare. Right
now it's blocked off. It's gonna be a thoroughfare
there. So we need some kind of measures there. And

also, this was mentioned before, at Geiger and Kapolei
Parkway.

Another section I wanted to bring to the DOT is
the section that DHHL is responsible
for, and that's the section that would connect Ewa to
Kapolei, the Villages of Kapolei. Actually, I support
the Villages of Kapolei. They don't really wanna see
this particular area built out. I support them. I
don't think this area should be built out either. I
think this should be a thoroughfare for Ewa Beach. I
think that that should be our accessing. Let then widen
their particular area and build their Interchanges and
have Post Weaver widening so we can secure this
particular route to that area. Thank you.

MR. HABAGA: Okay. Thank you. Tes. Cree
Malate from Varona Village.

MS. MALATE: I'm Cree Malate from Varona
Village and my concern about our place is as they build
that road, we have the bridge and we have that gonna be
a busy road after, so how you gonna cross if like three
lanes each gonna be like freeway, yeah. So I think we
need -- we need a stoplight. I don't mind if they build
like that, but, like, I think we need a stoplight for
that intersection once you cross the bridge for the
safety of the kids and us and everybody.
And one thing, my concern, too is like, you know, they open the railway over there, now it's very traffic. How much more to this if you have that road, new road they planning on build? So we like to close that gate, too, if possible.

So I'm for the road that they gonna make, too.

As long as, like just say Tenney and Varona gonna be divided, we have that road divide us. And before, the administration of Harris like said, Varona Village, you know, inaudible. We don't like that happen again. And we are a historical village in there. So, I hope they not going to separate us, segregate us from the other villages. That's my concern, too. Thank you.

MR. HAYASHI: Mr. Dudley.

MR. DUDLEY: Thank you very much. I'm Kiomi Dudley and I'm just representing myself tonight. I'm also concerned about the endangered species that are there and how those are gonna be taken care of. It's not that I'm against the road. It's that I am against taking endangered species and moving them when it's known that they're not going to survive. And if we're talking about endangered species that don't exist elsewhere, which I think we are, then, you know, we need to really give that some concern.

I wanna also tonight speak, though, about the freeway. I live, actually, in Mahakilo. I teach at Alea. Right now it's sometimes taking an hour and a half to go from Mahakilo to Alea, and that's about once a week. What are we going to do when we get this other road coming up there to the freeway? Now, it's not that I am against the road. It's that something has to be done to the freeway concurrently, and concurrently means at the same time. So, you know, we've got to do something about the freeway. We can't just make this road and put an extra lane on Fort Weaver Road. I'll never get to school. You know, and you'll never get to town. So it's just too much.

We've also got to start thinking about the fact that we, by plan, have made Hillani a bedroom community and this area a bedroom community. Now, you know, right now everybody has to go to town, as Glenn is saying. Do you know that when Kapolei is fully built out they only expect 25 percent of the cars in this area to go to Kapolei. Only 25 percent of the cars. That means every two houses, figuring that every house has two cars, every two houses that are built, three cars are going to town and one is going to Kapolei at the best of times years from now, okay. Now that's something we all have to keep in mind, folks. We're about to get into complete gridlock here on this island.
and this is the man that needs to help us out, so I'm glad he's here tonight to talk to us. Thank you very much.

MR. HARADA: Okay. Thank you, Todd Apo.

MR. AP: Aloha. My name is Todd Apo. I do speak in favor of this project. I think my thoughts echo a lot of what we've heard tonight. I think this is the very beginning. There's a lot of details that the DOT and the ultimate contractor need to take into account from the individuals at Varaona Village and other people in this area. I think the more important point is that I hope the DOT recognizes, I'm sure they do, that this is just one piece of a much bigger picture that needs to be taken care of in this region. And like I said, you've heard a lot of people testify about it and looking at the environmental impact and the overall impact of this project. We need to keep in mind that this is just a piece of the big puzzle that we need to solve for all of us. So, again, I speak in favor and I hope those considerations are taken into account. Thank you.

MR. HARADA: Thank you, Philwood Lee representing Rony Minda.

MR. LEE: Thank you, Director Harada.

Actually, I'm Philwood Lee. I'm actually speaking on my own behalf tonight. I'd like to thank everybody for coming, and I'd especially like to thank the DOT for putting this project in the forefront and finally getting something done for the North-South Road. Let's hear it for Harada and the DOT.

Also, our state legislators, Senator Willie Espera and Rony Minda for not just talking the talk, but walking the walk and delivering the money for this project. Without the money, we wouldn't have all this planning done, and so I'd like to thank the legislators for delivering the money and the DOT director and staff for putting this project in the forefront.

I'm in support of this project with the least amount of changes as proposed. We have a competent engineering firm in Parsons consulting firm, and they've done an excellent job in trying to find the most expedient route at the least cost and the least impact on the community. So I express our confidence in them and this project with as few changes as possible which would cause excess delays and cost run up. Thank you very much.

MR. HARADA: Thank you very much. I must apologize, I thought we had 40 people wanting to speak, but I believe we don't have that many. We have 42
people here in attendance this evening. So with that we
want to bring up Glenn Damids to finish what he
started. With that, Glenn.

MR. O'AMILDA: Thank you again. Bear with me.
This testimony on the endangered species was presented
in January and it hasn't been included in the EA, the
draft. So I was wondering why. Anyway, the relocation
plan, or without question, is a remnant of past
administration. In my opinion, I don't think this
administration should take the time and run with it, the
plan, or should burden or arbitrarily assume total
responsibility without listening first to all the
arguments, pro and con, weighing all the issues before a
final decision is made. My testimony focuses, of course,
you heard earlier on the North-South Road alignment and
also our in on the endangered species.

For the past 15 years, the people in Ewa lived
through two political administrations. They also
witnessed elected city-state representatives as well as
public officials come and go. Those were seen as status
quo years and business as usual. The game of politics
played in their own arena on an uneven field with no
public consultation or public participation. These
politicians were engaged in party politics and political
gamemanship to the extreme. Some politicians wanted to
be super stars by promoting their own goals and
interests. Others were always accused and seen as dirty
players, closely tied and deeply embedded in the belly
of the beast, the land owners and the developer.

I cannot dissemble, Mr. Haraga, the real purpose
of why I'm here this evening, nor can I go home without
expressing my thoughts on the State's plan to relocate
this little red lime, or the Ko'olau'a flower, an
indigenous native Hawaiian species, to its original
habitat. As everyone heard, my discussion was centered
largely on the North-South Road alignment, but I think
this Ko'olau'a flower was God sent and now I'm concerned
about this little flower.

As attitudes slowly change extending beyond
human relationships, beyond political gamemanship, so
should our feelings and compassion for environment and
for all living things. It is unquestionably a God given
responsibility to take care of the earth on which we all
live on and to protect and respect the sanctity of our
surroundings, the land, air, animals, and plants.

MR. HARAGA: Wrap it up.

MR. O'AMILDA: I can remember back five years
ago when Senator Representative Abercrombie was here and
he said, Glenn, look, I done a lot for you guys.
Appropriate money in Congress to give you guys a
North-South Road. You know what was reply, oh, thank you. But that road isn't even pertaining -- even convenient for the people in Ewa Beach. And be say, well, somebody should have told me.

MR. HABAGA: Glenn. Okay.

MR. ONOLOA: See, that's politics for you guys.

MR. HABAGA: Thank you, Glenn. Okay. We've got Ed Tagovailoa-Ano. Mrs. Tagovailoa-Ano: Aloha and good evening everyone. In such a pleasure to meet everyone here and so nice to see concerned people about the project that's going on.

I'm in support of this project. Basically, because it has been many, many years we've been trying to find another way and we haven't quite done that nor have we completed that. We've been stuck here in Ewa Beach with one way out and one way in. You're pretty much creative, you can go all the way down to Kapolei into Kahe and then out to where you live. But you know what, it's been long awaited and we really need to support this project.

People are complaining about the red lines. There's a lot of complaining going on here, but you know what, we weren't there. Senator Espino also appeared for the red lines and testified in support of this red lines, that they needed to do something. We, too, did the same thing. We went out to testify that they needed to support this red lines and what are they going to do about it. But you know what, a lot of our own constituent, our own community here in Ewa and Ewa Beach, the majority of us, did a lot of complaining, but no one showed up.

So please, I know that there's a lot of complaining going on here. The Department of Transportation is doing the best that they can, as well as the legislative here at the State capital, they're doing the best that they can, but they need our support. We cannot just be complaining here. We need to be a doer. Let's not sit here and bring out our complaints. We have to take a more active role in this. It isn't easy. Because I know the Department of Transportation is doing the best that they can, but you know what, every time a complaint comes out, it holds them back with the project. It holds the representatives and the senators from even trying to do anything, because we're trying to work together. We as a community have to come together.

If we don't come together, nothing's gonna ever be done and we're still gonna be stuck with one way in, one way out. Much mahalo.
MR. HARAGA: Thank you, Mr. Moses. Is there anyone else who would like to testify that hasn't signed up? Okay.

Representative Moses: Thank you very much. I know a lot of you have been working on this for many, many years, Dicky Beamer, Glenn Hamada. Many of you here, Kamehameha Village, Friends of Ewa. I know what you've been trying to do. It's about time we have this access because we need it.

Now, like Glenn said, we shouldn't have to have all of this care going to town. I wish I was the only one who had to drive to town. Maybe Pono and the Senator, too. Maybe we can all drive to town together, but the rest of the people I hope could work out here. Not yet. More jobs are coming, but not yet. Todd Afo from Koolina. But that's what we need to do. But in the meantime we need roads out here, okay.

This has been one of the things I've been working for at least 15 years now, not as long as many of you, but fortunately since 96-97 I've been on the State Transportation Committee, so I'm able to push it, with the help of the Senator and the Representative and I'm on the Policy Committee which approves these things. I want to tell you, there's only 13 of us on that committee and Rod Haraga is one and Cheryl Suen is another and I'm one. So there's already three out of 13. Without the votes, this wouldn't be approved and wouldn't get the federal money. So you can thank them very much for getting the money for this.

Now the red ilima. You know, I wanna move things, too, and make sure they grow. I hear Kioni say, you know, it's not gonna grow. I just want to remind you, this was sugar cane. There was nothing there. It was sugar cane. Every time it was burned, there was nothing there. No red ilima, no nothing, except for the black ash. And out of the ashes, the red ilima sprang. I believe it's a very hardy plant. I don't believe we can kill it off if we wanted to, and it has been transplanted at least three places. Are all three growing now, Rod?

MR. HARAGA: Yeah.

Representative Moses: Three different locations and they're all growing, and that's the federal guidelines. You have to have three outplantsing of it that survive. So that's been done. Red ilima is not gonna go away. Thank you.

ME. HARAGA: Thank you. Do we have any other people to testify? Okay, Kioni.

MR. DUDLEY: I thought we were at the end. I'll just take one second. I just wanted to say that...
KAPOLEI: And Clare, you got three minutes.
KAPOLEI: You heard Kapolei say they don't want this addition right here. They don't want that.

What does that make this road now? It becomes Ewa Beach's road. Doesn't it make sense? This road here, this proposed road, only would affect Ewa Beach people. It's clear. It's common sense. They don't want this portion, so there's nothing that links Ewa Beach with Makakilo and the west side. The alternative, and Mark and I sit -- we sat on the Ewa Development Plan, the plan was to have -- because of the golf course and the historic district, we want it inserted into the Ewa Development Plan that from this point there would be a finger coming up here as another alternative to the...
these two options right here so that it'd be convenient
for us. Thank you.
MR. HARAHA: Thanks, Glenn. Okay. Well, one
additional person. No. Same person. Louis Maria.
MR. MARIA: I'm just curious as to what Glenn
meant. You mean you wanted the road to run through Ewa
Town? 'Cause I know at one time you asked me to help
get rid of the historical designation.
MR. O'AMILDA: Yeah.
MR. MARIA: Okay. So I'm sorry, we cannot have
people from Ewa Beach saying that a road will run
through our town, the same as you wouldn't like us
telling us where you want -- we want a road through your
town. I don't think that's proper.
MR. O'AMILDA: Okay. Let me rebut that.
MR. MARIA: I'm talking, Glenn. You sit down
and you wait and then you can have your chance.
MR. O'AMILDA: Okay. I'll explain.
MR. MARIA: You know, we in Ewa have our towns
and we do not appreciate people from outside. Now the
same way you guys was gonna walk for Cal Kawamoto's
light, the people of Ewa can do the same thing with the
proposal to run a road through our villages. Thank you.
MR. O'AMILDA: Can I respond to that, Rod?
MR. HARAHA: No. There is no response on that.

There is no response to public testimony. Thank you.
Okay. With that, Representative Moses.
REPRESENTATIVE MOSES: It's not a response. I
just want to add, one of the key reasons we were able to
get the North-South Road funded is because of the plans
to build a University West Oahu campus right next to the
golf course. Right in here, okay. It's gonna be right
in there, and the North-South Road will go right up next
to it with a freeway access for people to come to it,
but also it'll have some interconnecting roads into the
campus. So that's one of the major reasons we're able
to get the funding for this road.
So it's not that Kapolei-Makahiki doesn't want
to use the road. We just don't want all of Ewa Beach --
excuse me, we don't want all of Ewa Beach to go right in
front of the middle school and the high school and
that's what will happen if it's open too soon before the
other roads around it.
MR. HARAHA: Thank you, Representative,
MR. O'AMILDA: Comment, Rod.
MR. HARAHA: Just a comment.
MR. O'AMILDA: Back in the '70s and '80s, these
two islands were not here. We wanted a road to go through
the village which was all that the people wanted. The
people in Ewa, all the villages wanted a road. The road
was proposed to go through the villages up to within a
mile limit. How we have these two, one historical site,
one the golf course, and it's 2004. We can't go through
here. We cannot. But here's the proposal that we go
from here to finger along here. I'm gonna put the
college here -- if they gonna put the college on the
west side of the proposed freeway, let's be equal
distance. Let's share the road halfway between these
two points. Let's share it. Let's share it. Let's
come out here so we don't have to go this way and this
way. All we doing is losing 10 miles every time we take
this North-South Road and come back to Port Weaver Road,
we've lost 10 miles. Understand that. People, we've
lost.

MR. HARAGA: Thank you, Glenn. So with that,
if there are any other folks that wanna speak. Okay.
Thank you for your time and testimony this evening.
Again, should you have any questions or comments on this
project after this evening, please send them to the
contact information located on either the big sheet or
the little sheet, that looks like this, by

So I want to thank you on behalf of the
Department of Transportation and the Department of
Transportation Services for coming out and giving us

your feelings about the North-South collective road,
thank you very much.

(Meeting concluded at 8:56 p.m.)
CERTIFICATE

STATE OF HAWAII

CITY AND COUNTY OF HONOLULU

I, BARBARA ACORA, Certified Shorthand
Reporter and Notary Public, State of Hawaii, do
hereby certify:

That on Wednesday, September 1, 2004, at
7:09 p.m., the foregoing meeting was taken down by me in
machine shorthand and was thereafter reduced to
typewriting under my supervision, that the foregoing
represents, to the best of my ability, a true and
correct transcript of the proceedings had in the
foregoing matter.

I further certify that I am not an attorney
for any of the parties hereto, nor in any way concerned
with the cause.

Dated this 3rd day of September, 2004,
In Honolulu, Hawaii.

BARBARA ACORA, CSR NO. 412
Notary Public, State of Hawaii
My Commission Exp: 10-23-2004

RALPH ROSENBERG COURT REPORTERS
Honolulu, Hawaii (808) 924-2090
STATE OF HAWAII

NORTH-SOUTH ROAD and KAPOLEI PARKWAY
PUBLIC HEARING
ASING PARK, EWA, HAWAII

WEDNESDAY, SEPTEMBER 1, 2004

BEFORE: Patricia Rivera, CSR 176
Notary Public, State of Hawaii
Mr. Philwood Lee: Okay. I am Philwood Lee.

And I would like to testify in support of the North-South Road as proposed. And I would like -- I am in support of as few changes as possible and to proceed at a minimum of excess cost with regard and concern for the environment.

I would like to see the North-South Road and Kapolei Parkway proceed with all deliberate speed, with as few changes as possible in the current design. That's all. Thank you.

Ms. Curry: My comments is going to be extremely brief. I'm C. C. Curry with Intergency Coordination Council Organization is a voting member of GON, O-H-P-O, Oahu Metropolitan Planning Organization.

And I have an extremely brief comment regarding the North-South Road is that as a voting agency within the Citizens Advisory Committee, we are very appreciative of the fact that mayoral candidate Nui has Hana's talking about an alternative to the North-South Road being an interisland -- intrasland ferry.

In other words, the restoration of the Wikiwii ferry, which we had for 5-million-dollar pilot program, and it took all the tons of traffic off Fort Weaver Road and it would continue to do so.

It is the best alternative. And the appropriation of the funds that are going to the North-South Road would be much better reappropriated to restore the Hawaii super ferry alternative to the Wikiwii ferry. It would be more cost efficient and a better alternative to more land traffic.

And I just guess I better add a little footnote. They need to rename it from North-South Road because that's a real misnomer. It is not a north-south road. It's perpendicular east-west road, not a north-south road. And it goes the opposite direction of going Diamond Head. It goes Koa-Kapolei direction which is not the direction anybody wants to go.

So that's it. Bring back the ferry.

(Proceeding concluded.)
CERTIFICATE

STATE OF HAWAII

CITY AND COUNTY OF HONOLULU

I, PATRICIA RIVERA, Notary Public, State of
Hawaii, do hereby certify:

That on Wednesday, September 1, 2004;
That the proceeding was taken down by me in
machine shorthand and was thereafter reduced to
typewriting under my supervision; that the foregoing
represents, to the best of my ability, a true and correct
transcript of the proceedings had in the foregoing
matter.

I further certify that I am not attorney for
any of the parties hereto, nor in any way concerned with
the cause.

DATED this 12th day of SEPTEMBER 2004, in
Honolulu, Hawaii.

PATRICIA RIVERA, CSR 175
Notary Public, State of Hawaii
My commission expires 4/08/08
COMMENTS AND RESPONSES ON

2004 REVISED DRAFT ENVIRONMENTAL ASSESSMENT
August 19, 2004

Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
609 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga,

We have reviewed the project in question and have found that the concerns we had over this project in the 1999 Draft Environmental Assessment have been adequately addressed. Therefore, we have no further comments to make at this time.

Thank you for your opportunity to review this project.

Sincerely,

[Signature]

Lawrence T. Yamamoto
State Conservationist

For the Natural Resources Conservation Service

---

Ms. Lawrence T. Yamamoto
State Conservationist
Natural Resources Conservation Service
Department of Agriculture
P.O. Box 590041
Honolulu, HI 96850

Dear Ms. Yamamoto,

Subject: North-South Road and Kapolei Parkway
       Rev. Rd. of Oahu
       Project No. HWY-O-00-92
       Revised Draft Environmental Assessment

Thank you for your letter of August 19, 2004, which mentions that your concerns regarding this project have been adequately addressed in the project's Revised Draft Environmental Assessment.

We sincerely appreciate your review of this document, and if any other questions or issues arise, please feel free to contact us at your earliest convenience.

Very truly yours,

[Signature]

Rodney K. Haraga
Director of Transportation
Civil Works Technical Branch

August 16, 2004

Mr. Rodney K. Harag, Director
Department of Transportation
State of Hawaii
859 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Thank you for the opportunity to review and comment on the Revised Draft Environmental Assessment (RDEA) for the North-South Road and Kapolei Parkway, Ewa, Oahu. The following comments are provided in accordance with Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on the information provided, a DA permit may be required for the project; however, additional information will be required to make a final determination. Please contact Ms. Connie Ramsey of our Regulatory Branch for further guidance at (808) 438-0268 and refer to file number 20040444.

b. The flood hazard information provided on page 3-5 of the RDEA is correct.

Should you require additional information, please contact Ms. Jessie Dobrowick of my staff at (808) 438-8878.

Sincerely,

James Penaau, P.E.
Chief, Civil Works
Technical Branch

Mr. James Penaau, P.E.
Chief, Civil Works
Technical Branch, Department of the Army
U.S. Army Engineer District, Honolulu
Building 223
Fort Shafter, HI 96850-1440

Dear Mr. Penaau:

Subject: North-South Road and Kapolei Parkway
Re: Island of Oahu
Project No.: HWW-0-91-92
Revised Draft Environmental Assessment

Thank you for your letter of August 16, 2004, which commented on the Revised Draft Environmental Assessment for this project.

Our responses to each of your comments are provided below:

a. Two bridges will be required to span the Kahului Gulch, and we anticipate that a Clean Water Act (CWA), Section 404 permit will be required. In any event, we will contact your Regulatory Branch for further guidance and file number 20040444 will be used. For your information, in a letter dated February 23, 1998, the U.S. Army, Corps of Engineers, has indicated their jurisdiction over the Kahului Gulch.

b. Your verification of our flood hazard information is appreciated.
We very much appreciate your participation in this project, and if any questions or problems arise, please feel free to contact us at your earliest opportunity.

Very truly yours,

[Signature]

[Name]
Director of Transportation

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August 22, 2001

Mr. Rodney F. Hauge, Director
State of Hawaii
Dept. of Transportation
680 Punchbowl Street
Honolulu, HI 96813

Re: Reviled DEA, North-South Road Project
County of Honolulu, HI

Dear Mr. Hauge,

This letter serves to respond to your request for Agency input with respect to the referenced Revised Draft Environmental Assessment for the North-South Road and Kapolei Parkway Project, planned for development within the County of Honolulu, Hawaii.

Please review the current effective Flood Insurance Rate Maps (FIRM) for the referred area Community and any other jurisdictional impacts that are previously. The County of Honolulu is a participant in the National Flood Insurance Program (NFIP) and the current Flood Insurance Rate Maps (FIRM) are on file and available for review within the Planning & Permitting Division. Any development within this jurisdiction must comply with the requirements of the County floodplain ordinance, which regulates development within the High Risk Special Flood Hazard Area (SFHA) and meets the minimum Federal requirements established in Vol. 44, Code of Federal Regulations (44CFR). The NFIP floodplain management building requirements are described in Sections 59 through 65 of the Code.

A Floodplain Determination must be made which classifies each of the proposed project areas within any SFHA shown on the current FIRM. This determination must be performed in accordance with the standards and criteria established in the National Flood Insurance Program (NFIP) and must be performed prior to the start of development and prior to obtaining an ULV. The NFIP floodplain management building requirements are summarized as follows:

- The term development means any new change in improved or unimproved real estate, including but not limited to buildings, other structures, mining, excavation, filling, grading, paving, conversion of drilling operations, and storage of equipment or materials.
• If the area of development is located within a Regulatory Floodway as delineated on the FIRM, any development must not increase base flood elevations. A hydrologic and hydraulic analysis must be performed prior to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. Notice is permitted within regulatory floodways.

• If implementation of the proposed project would result in a rise of the RFE, the requirements for reviewing the FIRM must be implemented (44CFR § 133.31). These requirements may include obtaining a Conditional Letter of Map Revision (CLOMR) from FEMA prior to the start of any development that will cause any rise within a floodway so that it will alter or release a watercourse.

• Until a regulatory floodway is designated on the SFHA maps pertaining to this project site location, the Community shall assume that no new development (including FD) shall be permitted within the SFHA unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated developments, will not increase the water surface elevation of the 100-year base flood more than one foot at any point within the community.

• Upon completion of any development that results in physical changes that increase or decrease the RFE or otherwise changes existing special flood hazard areas, the FIRM directs all participating communities to retain the appropriate technical, hydrologic and hydraulic data to FEMA for a floodplain map as soon as practicable, but not later than one month after such data becomes available, in accordance with CFR 61.4.1. To obtain copies of FEMA’s Flood Map Revise Application Packages, please refer to the FEMA website at: http://www.fema.gov/forwrl欧阳 map

• All buildings constructed within a coastal floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through AO) as delineated on the FIRM, must be elevated so that the lowest floor of a residential building is at or above the RFE in accordance with the effective Flood Insurance Rate Map.

• Coastal developments: All buildings constructed within a coastal high hazard area, (any of the "C" Flood Zones as delineated on the FIRM), must be elevated or other structural solutions, such as the lowest basement structural element, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the site and pilings foundation and the structure attached herein, is designed to maintain flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.

• Public Utilities: Proposed new developments in a flood-prone area shall be reviewed to ensure that all public utilities and facilities, such as sewer, gas, electrical, and water systems are located and surrounded to minimize or eliminate flood damage, and

• Sewerage systems: The Community (County of Honolulu) shall require within flood-prone areas new and replacement sewerage systems to be designed to minimize or eliminate infiltration of flood waters into the system and discharge from the system to flood waters and, where tank or disposal systems are located to avoid equipment to items, or contamination from them during flooding.

• Altering a watercourse: The NFIP participating community (County of Honolulu) shall notify, in advance, the local utilities, adjacent communities and the Hawaii State Coordinator prior to any alteration or relocation of any watercourse, and submit copies of such notifications to the FEMA

Administrator and;

• Ensure that the flood-erosion capacity within the altered or relocated portion of any watercourse is maintained.

The full text of Volume 46, Code of Federal Regulations (44CFR) may be found on the Internet at: http://www.fema.gov/forwrl欧阳 map

In addition, compliance with Executive Order 11988 on Floodplain Management and Executive Order 11930 on Protection of Wetlands should be considered with respect to the project site map, including a review of impacts associated with restrictions identified under federal, state or local floodplain regulations. These Orders are implemented under FEMA’s regulations at 44CFR Part 61 Floodplain Management and Protection of Wetlands.

Please Note:

Many communities participating in the NFIP have adopted building requirements and regulations that are more restrictive or comprehensive than the minimum federal criteria set forth in CFR 61 for purposes of floodplain management and regulation of development in the floodplains. You can review the County of Hawaii’s Floodplain Administrator at (808) 523-4547 for further information on local permitting requirements.

If you have any questions, or if you need further assistance, you may contact Cindy Mollinedo of this office by telephone at: (808) 671-7777, or by e-mail at: Cindy.Mollinedo@gov

Sincerely,

Claire C. Pulehale
Natural Hazards Program Specialist
Environmental Review Coordinator
Molokai Division, Region IX
(808) 677-2056

Cc: Saule Amane, Region IX Environmental Officer
department of Environmental Control
235 S. Beretania, Suite 102
Honolulu, HI 96813

Page 3 of 3
Ms. Clare Polansky  
Hawai'i Hazards Program Specialist  
Environmental Review Coordinator  
Mitigation Division, Region IX  
Federal Emergency Management Agency  
U.S. Department of Homeland Security  
1111 Broadway, Suite 1300  
Oakland, CA  94607-4052

Dear Ms. Polansky:

Subject: North South Road and Kapolei Parkway  
Ewa, Island of Oahu  
Project No: HWY-00-01-92  
Revised Draft Environmental Assessment

Thank you for your letter of August 22, 2004, which commented on Revised Draft Environmental Assessment for this project.

For each of your comments, we have the following responses, which are generally in a corresponding order:

1. We have reviewed the latest Flood Insurance Rate Maps (FIMs) for the region in the vicinity of this project. Several Letters of Map Revise (LOMR) and Conditional Letters of Map Revise (CLORs) have been coordinated with and approved by Federal Emergency Management Agency. Accordingly, portions of the project are located within a designated floodplain, and in addition, the project does not extend upon any regulatory floodway. Most of the project is located within areas designated as "undetermined" or "undetermined".

2. An embankment for the proposed highways will be provided and a major section of the proposed North South Road will be located within the areas which have been designated as "undetermined," other portions of the project and highway embankments are located within a designated floodplain. Excavation for a detention basin would occur within the designated floodplain, thereby increasing floodwater storage capacity. Drainage channels and other features would also be implemented, which would reduce the flooding of existing areas. In summary, we believe that this project will not increase base flood levels.

It should be noted that the project conforms with the requirements of a Memorandum of Understanding issued by the Civil Defense Task Force and the project's drainage plans have been approved by the City and County of Honolulu, Department of Planning and Permitting.

In addition, a risk analysis is currently being developed to confirm the above-referenced findings. This risk analysis will be finalized and approved, prior to a FONSI determination by FHWA.

3. This project will comply with relevant floodplain management building requirements of the National Flood Insurance Program.

4. As indicated in the Revised DEA, there are no identified wetlands in the project area. The floodplain management requirements of Title 23, Code of Federal Regulations 650, Subpart A, will be addressed in the Final EA and will be detailed in more detail in the forthcoming risk analysis and location hydraulic study, which will also be submitted to FEMA.

We understand your concern for this project and are hopeful of your continuing assistance.

Very truly yours,

RODNEY K. HARADA  
Director of Transportation
Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
465 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Haraga:

SUBJECT: NORTH-SOUTH ROAD AND KAPOLEI PARKWAY I-1 FREEWAY TO BRISTOL ROAD, I-51, OAHU PROJECT NO. DOT-0-02-92

In response to your letter (OCT-94 3.4685) dated July 23, 2004, the Navy has no comments to the Revised Draft Environmental Assessment for the subject project.

Should you have any questions regarding this matter, please contact Mr. Jeff Sekehichi at (808) 471-1170 extension 261, fax (808) 471-1140, or email jeffrey.sekehichi@navy.mil.

Sincerely,

D. C. Lewis
LDRM, CNE, U. S. Navy
Deputy Program Manager for Facilities, Environmental, Safety, and Passenger Transportation

By direction of
Commander, Navy Region Hawaii

LCOR D. C. Lewis
Navy Region Hawaii
Department of the Navy
830 Punchbowl Street, suite 110
Pearl Harbor, HI 96840-5101

Dear Commander Lewis:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 24, 2004, regarding the Revised Draft Environmental Assessment for this project.

We sincerely appreciate your review of this document.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation
August 9, 2004

Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Haraga:

Your letter of July 22, 2004, requested our review and comment on the Revised Draft Environmental Assessment (Revised DCA) for your project "North-South Road and Kapolei Parkway H-1 Freeway to H-101 Road", Ewa, Oahu, Hawaii (Project No. HWY-0301-92).

The Federal Aviation Administration has no objections or comments regarding the subject project.

We appreciate this opportunity to comment. If there are any questions, please contact us at 841-1234.

Sincerely,

Darice B. N. Fong
Realty Contracting Officer

cci:
State of Hawaii
Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813

Ms. Darice B. N. Young
Real Estate Contracting Officer
Federal Aviation Administration
U.S. Department of Transportation
P.O. Box 30109
Honolulu, HI 96850-5000

Dear Ms. Young:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-0301-92
Revised Draft Environmental Assessment

Thank you for your letter of August 9, 2004, which commented on this project and its Revised Draft Environmental Assessment.

We sincerely appreciate your review of this document, and if any problems or questions arise, please feel free to contact us at your earliest convenience.

Very truly yours,

Rodney K. Haraga
Director of Transportation
TO: The Honorable Russ K. Saito, Controller
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

FROM: Rodney K. Haraga
DIRECTOR OF TRANSPORTATION

SUBJECT: NORTH-SOUTH ROAD AND KALO PILAl PARKWAY
EWA, ISLAND OF OAHU
PROJECT NO. HWY-0-93-92
REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for your memorandum of August 23, 2003, regarding the Revised Draft Environmental Assessment for this project.

We appreciate your review of this document, and if any questions or problems arise, please feel free to contact us at your earliest convenience.

Ms. Gertrude Salomonsen, OSQC
TO: MAJER TRACEY QMORI DEPARTMENT OF DEFENSE
FROM: RODNEY K. HABAGA DIRECTOR OF TRANSPORTATION
SUBJECT: NORTH-SOUTH ROAD AND KAPOLEI PARKWAY EWA, ISLAND OF OAHU PROJECT NO. HI-WY-0-01-92 REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for your mail of August 7, 2004, which requested a copy of the project’s Revised Draft Environmental Assessment (DEA) for the Construction and Facilities and Management Office, of the Hawaii Army National Guard.

We believe that a copy of the Revised DEA has been forwarded as requested, and if any questions or problems arise, please feel free to contact us at your earliest convenience.

Roderick M. Hoesly
Chief Engineer
Honolulu District
U.S. Army Corps of Engineers
PO Box 2443
Honolulu, HI 96816-0405

Rodney K. Habaga
Director of Transportation
Hawaii Army National Guard
1776 Kaahumanu Avenue
Honolulu, HI 96817-3601
MEMO TO: The Honorable Rodney K. Haraga, Director
      Department of Transportation
FROM: RODNEY K. HARAGA
      Director of Transportation
SUBJECT: Revised Draft Environmental Assessment for North-South Road and Kapolei Parkway

The Department of Education (DOE) has reviewed the Revised Draft Environmental Assessment (Revised D EA) for the North-South Road and Kapolei Parkway from the H-1 Freeway to Waiawa Road. The DOE believes that the route selected in the North-South Road and Kapolei Parkway from the H-1 Freeway to Waiawa Road. The DOE believes that the route selected in the Revised D EA may be acceptable to the DOE.

The DOE appreciates the Revised D EA's recognition of the benefit of providing an educationally sound environment for students and the need to accommodate the needs of the future.

We are, however, concerned about the potential impact of the Revised D EA on the DOE facilities and the students of the DOE. We have not made a final decision on the Revised D EA, but we welcome the opportunity to review it.

If you have any questions, please contact me at 643-3344 or e-mail me at rodley_haraga@hawaii.gov.

Thank you for your interest.

Rodney K. Haraga

Attachment:

- Revised Draft Environmental Assessment
- DOE Facilities and Support Services Branch

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER
Mr. Ronald Tsuzuki  
September 16, 2004  
Page 2

It is also noted that the 50-foot wide utility corridor, which was once situated on the west side of North-South Road has shifted to the east side, thus placing the travelway even closer to our proposed development and thereby creating a greater impact than that stated in the EA.

We also question the need to address traffic, noise, and air quality impacts along Farrington Highway if this is not part of the proposed action. Further, it is assumed that the setback requirements for Kapolei Parkway only applies to the City's portion through Verona Village and not DHHL's portion - that between the Villages of Kapolei and the North-South Road intersection.

To alleviate this problem, we are requesting that DOT construct the sound attenuation barrier or wall within its right-of-way fronting Parcel B. This will allow our Department to fully utilize the limited lands we have available to meet our goals in serving the Native Hawaiian community.

If there are any questions regarding these comments, please feel free to contact me at 586-3861.

Mahalo and aloha,

Mick A. Kane, Chairman  
Hawaiian Homes Commission
TO:  
THE HONORABLE MICAH A. KANE, CHAIRMAN  
HAWAIIAN HOMES COMMISSION

FROM:  
RODNEY K. HARADA  
DIRECTOR OF TRANSIT  

SUBJECT:  
NORTH-SOUTH ROAD AND KAPOLEI PARKWAY  
EWA, ISLAND OF OAHU  
PROJECT NO. IHW-O-03-95  
REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for your letter dated September 16, 2004, which commented on the Revised Draft Environmental Assessment for this project.

We have the following responses to each of your comments and these responses have been placed in a corresponding order:

1. In accordance with our “Noise Analysis and Abatement Policy”, as approved by the Federal Highway Administration, after a project’s environmental analysis and documentation is finalized, the State Department of Transportation (DOT) will no longer be responsible for providing noise abatement for new developments. This document also defines “existing” developments (as opposed to “new” developments) as improvements that have received building permits.

Hence, the proposed development in Ewa Kapolei, by the Department of Hawaii Homes Lands, is considered a “new” development, and the DOT is not responsible for noise abatement measures which may be necessary for this development.

2. The residential setback, which are reflected in the Revised DEA, are recommended, not required. Beyond these setbacks, noise abatement measures are not necessary. Within the highway setbacks, noise impacts should be further evaluated, to determine if feasible and reasonable courses of action are possible.

3. Because the project will intersect Farrington Highway, the potential effects of the proposed intersection should be addressed. Potential traffic, noise and air quality impacts in the vicinity of Farrington Highway, which are caused by the proposed North-South Road/Farrington Highway intersection, are indicated in the Revised DEA and may only involve the immediate area of this intersection.

In addition, we agree that the setback recommendation for Kapolei Parkway applies only to the portion under the jurisdiction of the City and County of Honolulu. The DHHL portion of Kapolei Parkway, which is located entirely of the North-South Road/Kapolei Parkway intersection, was not included in the noise analysis for this project.

4. Your request for a sound wall housing Parcel D warrants our further evaluation and consideration. The construction of the western half of this project is several years away, and the installation of noise reduction features may be incorporated into this project phase. However, more discussions are needed and the detailed plans for your development of Parcel D should be submitted for our justification studies and programming requirements.

We appreciate your concern for this project and our Native Hawaiian community, and we look forward to hearing from you.
The Honorable Rodney K. Haraga,
Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

SUBJECT: North South Road and Kapolei Parkway
15-1 Freeway to H1 Freeway, Ewa, Oahu
Project No. H-WY-06-92

The following are our comments to the above Revised Draft Environmental Assessment:

1. The Office of Solid Waste Management recommends the development of a solid waste management plan that encompasses all project phases including demolition, construction, and occupation of the buildings.

Specific examples of elements that the plan should address include:

- Recycling green waste generated during clear and grub activities;
- Recycling construction and demolition waste, if applicable, and;
- The use of locally produced compost in landscaping.

2. Hawaii Revised Statutes Chapter 153-3 states that all highway and road construction and improvement projects funded by the State or a county or any roadways that are to be occupied by the State or a county or roadways that are to be utilized for public roads shall utilize crushed glass aggregate as specified by the Department of Transportation in all basecourse (treated or untreated) and subbase when the glass is available at the quantity and contractor at a price no greater than that of the equivalent aggregate.

3. The developer shall ensure that all solid waste generated during project construction is directed to a Department of Health permitted solid waste disposal or recycling facility.

Should there be any questions, please contact Mr. Lane Cho at 688-4228.

Sincerely,

STEVEN K. KAM,
Chief
Office of Environmental Quality Control

TO: STEPHEN Y. K. CHANG, CHIEF
SOILD AND HAZARDOUS WASTE BRANCH
DEPARTMENT OF HEALTH

FROM: ROYDEN K. HABAGA
DIRECTOR OF TRANSPORTATION

SUBJECT: NORTH SOUTH ROAD AND KAPOLEI PARKWAY
EWU, ISLAND OF OAHU
PROJECT NO. H-WY-06-92
REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for your letter of August 3, 2004, which commented on the Revised Draft Environmental Assessment for this project.

We appreciate receiving your information regarding solid waste disposal and the use of recycled glass materials for this project. Please also assure that your recommendations and requirements will be considered in our construction contract and plans.

If any other questions or problems arise, please feel free to contact us at your earliest convenience.
The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject application and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9259 to identify whether a Federal license or permit (including a Department of Army permit) is required for this project. Pursuant to Section 401(A)(1) of the Federal Water Pollution Act (commonly known as the "Clean Water Act"), a Section 401 Water Quality Certification is required for "prior applicant for Federal license or permit to construct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters..."

2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:
   a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Section 122.26(4)(A)(ii) and 122.26(4)(A)(iv). Construction activities, including clearing, grading and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple square and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the commencement of the construction activities.
   b. Discharge of treated effluent from leaking underground storage tank remedial activities.
   c. Discharge of storm water less than one (1) million gallons per day.

The Honorable Rodney K. Hara
August 19, 2004
Page 2

a. Discharges of hydrotreating water.

b. Discharges of construction dewatering effluent.

g. Discharges of treated effluent from petroleum bulk stations and terminals.

h. Discharges of treated effluent from well drilling activities.

i. Discharges of treated effluent from recycled water distribution systems.

j. Discharges of storm water from a small municipal separate storm sewer system.

k. Discharges of storm water from decorative ponds or lakes.

The CWB requires that a Notice of Intent (NOI) be served by an NPDES general permit for any of the above activities. The NOI forms may be picked up at our office or downloaded from our website at [http://www.environmental.state.hi.us/permitting/permitapplications/index.html](http://www.environmental.state.hi.us/permitting/permitapplications/index.html)

3. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into storm water and/or coverage of the discharge(s) under the NPDES general permit is not permissible. (i.e. NPDES general permits do not cover discharges into Class 1 or Class AA storm water). An application for the NPDES permit is to be submitted at least 180 days before the commencement of the corrective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at [http://www.environmental.state.hi.us/permitting/permitapplications/index.html](http://www.environmental.state.hi.us/permitting/permitapplications/index.html)

4. Hawaii Administrative Rules (HAR), Section 15-55-34, also requires the applicant to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD.

5. The DOH is in the process of finalizing HAR, Chapters 15-54 and 15-55 to regulate the application of pollutants to surface waters of the State. This may include oversight of the application of pollutants to surface waters of the State. Therefore, the applicant may be required to disturb the revised regulations before the commencement of the construction activities.

If you have any questions, please contact Ms. Kaie Poots of the Engineering Section, CWB, at 808-639-
The Honorable Rodney K. Hamana
State Department of Transportation
150 Punchbowl Street
Honolulu, Hawaii 96813-5077
Attention: Mr. Ronald Yonemura
Head Planning Engineer

September 3, 2004

Dear Mr. Hamana:

Subject: Review and Comment on Revised Draft Environmental Assessment (DEA) for
North-South Road and Kapolei Parkway
I-1 Freeway to H不同iale Road, Paio, Oahu
Project No. HWT-0-019-92

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the Revised DEA, dated July 2004. Further work being the proposed right-of-way (ROW) is classified as Class 3, Island Waters (Hawai‘i Administrative Rules (HAR), Section 11-34-61.1(a)). The CWB has the following comments:

1. Pursuant to Section 401(a)(1) of the Federal Water Pollution Control Act (commonly known as the “Clean Water Act,” a Section 401 Water Quality Certification is required for “All projects for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters.”

2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:
   a. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the commencement of the construction activities.
   b. Discharges of hydromulching water.
   c. Discharges of construction decontaminating effluents.

The Honorable Rodney K. Hamana
September 3, 2004

Page 2

The CWB requires that a Notice of Intent (NOI) be submitted to an NPDES general permit for any of the above activities to be submitted at least 30 days before the commencement of the respective activities. The NOI form may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/planning/npdes/noi-direct.html.

The applicant may be required to apply for an individual NPDES permit if there is any type of discharge into waters is discharged from the project into State waters and/or coverage of the dischargers under the NPDES general permit(s) is not permissible. An application for the NPDES permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/planning/npdes/noi-direct.html.

The EA, Section 11-35-18, also requires the applicant to either submit a copy of the new NOI or NPDES permit/application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project activity, as it covers by the NOI or application has been or is being reviewed by SHPD. Please submit a copy of the request for review by SHPD or SHPD’s determination letter for the project.

Please note that, in general, anyone causing or contributing to a violation of the State water quality standards must apply for an NPDES permit coverage. Discharges which are not an integral and normal part of the operation, but are caused by heavy rains, floods, or other events outside the reasonable control of the owner or operator must also be permitted. Point sources include vehicle wash discharges or a discharge of treated wastewater from your construction activity. If there is a discharge of any pollutants to State waters, Hawaii Revised Statutes, Section 143G-11, provides for penalties of up to $5,000 per day for each violation. The CWB reserves its right to seek penalties for all violations.

Sincerely,

Cheryl Leimana Fukumoto, M.D.
Director of Health

City of Hawaii, Office of Environmental Quality Control, 235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813
Mr. Ronald Yonemura, Head Planning Engineer, State Department of Transportation
- via email to crileimana@gmail.com only
Mr. Dean Yoo, State Department of Transportation, Highways Division, Oahu District - via fax (808) 471-5233 only
Mr. Gerald Takayama, Head, Storm Water Quality Branch, City Department of Environmental Services, Division of Environmental Quality - via fax (808) 579-5730 only
TO:       THE HONORABLE CHIYOMI LENAAI FUKINO, M.D.
          DEPARTMENT OF HEALTH

FROM:     RODNEY K. HARAGA
          DIRECTOR OF TRANSPORTATION

SUBJECT:  NORTH SOUTH ROAD AND KAPOLEI PARKWAY
          EWA, ISLAND OF OAHU
          PROJECT NO. HWY-O-01-92
          REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for your letter of September 3, 2004 and your memorandum of August 19, 2004, which
commented on the Revised Draft Environmental Assessment for this project.

Please be assured that we will fully comply with the requirements of Sections 401 and 404 of the
Federal Water Pollution Control Act, and with Hawaii Administrative Rules (HAR), Section 11-55-38.
We will also be requesting a National Pollutant Discharge Elimination System (NPDES) general permit,
for stormwater discharges due to our construction activities, and we anticipate submitting a Notice of
Intent for this permit.

In addition, there are no surface waters in the vicinity of this project, and we do not believe that the
spraying of pesticides will be necessary; consequently, HAR, Chapters 11-54 and 11-55 may not be
applicable to this project.

If any other questions or problems arise, please feel free to contact us at your earliest convenience.

Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
699 Punchbowl Street
Honolulu, Hawaii 96813

August 23, 2004

Dear Mr. Haraga:

This is in response to your letter of July 22, 2004, requesting a departmental review on the
Revised Draft Environmental Assessment of Project No. HWY-O-91-92.

Mr. Larry Hiha, Oahu Section 2 Administrator of our Department oversees five offices of
approximately 50 employees in the Kahului State Office Building in Kapolei. An informal
poll was conducted and many of the staff felt that this project would not have any impact on
the way work is accomplished. However, a small minority felt that possibly this project may add
to the traffic and that may have an impact on both employees and clients, especially in the
afternoon hours.

Thank you again for allowing us to comment. If there are any further questions, please feel
free to call Mr. Hiha at 974-3309.

Sincerely,

Henry Chen
Deputy Director

c. SOH, Office of Environmental Quality Control

ANALOGY, DEPARTMENT OF HUMAN SERVICES

STATE OF HAWAI\n
DEPARTMENT OF TRANSPORTATION
HEWALU STREET
EWA, ISLAND OF OAHU

HIWY-PA
2.5311

STATE OF HAWAI\n
DEPARTMENT OF HUMAN SERVICES
RHEV, EMPLOYMENT AND SUPPORT SERVICES DIVISION
699 Punchbowl Street, Suite 900
Honolulu, Hawaii 96813

August 23, 2004

Refer to: 04-0682
TO:  
THE HONORABLE HENRY OLIVA, DEPUTY DIRECTOR  
DEPARTMENT OF HUMAN SERVICES

FROM:  
RODNEY K. HAKAGA  
DIRECTOR OF TRANSPORTATION

SUBJECT:  
NORTH-SOUTH ROAD AND KAPOLEI PARKWAY  
EWA, ISLAND OF OAHU  
PROJECT NO. HWY-0-01-92  
REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for your letter of August 31, 2004, which commented on this project and its Revised Draft Environmental Assessment.

We appreciate receiving the results of your informal survey. Contrary to your findings, we are hopeful that this project will significantly improve travel for your personnel and clients.

If any other questions or problems arise, please feel free to contact us at your earliest convenience.

Mr. Rodney K. Hanusa
Director
State Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Subject: North-South Road and Kapolei Parkway, H-1 Freeway to Renton Road, Ewa, Oahu, Project No. HWY-0-01-92, Revised Draft Environmental Assessment.

We appreciate the opportunity to comment on your subject request. DOWA has been involved with developing a Habitat Conservation Plan (HCP) to mitigate the impacts that this project will have on the Aloha. The partnership between DOE, DOWA, USF, West Oahu, and DLNR DOWA has produced an agreed working plan (AGW) to prevent the endangered plants in the area. DOWA will continue to work with DOE and we thank you for the opportunity to comment on the revised draft EA.

Sincerely yours,

[Signature]

Paul J. Waring
Administrator

C: GECO  
Vickie Casway, DOWA Administration  
Bill Stanfill, DOWA Administration  
DOWA, Oahu Branch
TO:  PAUL J. CONRY, ADMINISTRATOR  
DIVISION OF FORESTRY AND WILDLIFE  
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM:  RODNEY K. HARAGA  
DIRECTOR OF TRANSPORTATION

SUBJECT: NORTH-SOUTH ROAD AND KAPOLEI PARKWAY  
EWA, ISLAND OF OAHU  
PROJECT NO. HWY-O-81-92  
REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for your letter of August 24, 2004, which commented on the Revised Draft Environmental Assessment for this project.

We sincerely appreciate your continuing support of this project, and if any questions or concerns arise, please feel free to contact us at your earliest opportunity.
Mr. Rodney Hagesa, Director
State of Hawaii
Department of Transportation
859 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hagesa:

Thank you for allowing us to comment on the Revised Draft Environmental Assessment for the North-South Road and Kapolei Parkway, Project No. HWY-G-01-92.

The only watercourse this roadway project crosses is Kailo Gulch. This gulch is not considered to be a stream as defined in the Hawaii Water Code, therefore this project will not require a stream channel alteration permit pursuant to Hawaii Revised Statutes 517C-71.

The roadway project may require other agency approvals regarding water quality, wetlands, grading, grubbing, stockpiling, and roadway and drainage maintenance. This letter does not constitute or imply compliance with other Federal, State or county rules.

If you have any questions regarding this letter, please call David Higa at 587-0240.

Sincerely,

[Signature]

YVONNE Y. IZU
Deputy Director

Office of Environmental Quality Control
MEMORANDUM

TO: Dieudone S. Maniya, Administrator Land Division
FROM: Robert M. Ing, Land Agent
SUBJECT: North-South Road and Kapolei Parkway

Please review the document pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

*Note: One copy of the document is available for your review in the Land Division Office, Room 202.

Should you need more time to review the subject matter, please contact HCC Vescaro at 647-3384. If this office does not receive your comments by the suspense date, we will assume these are no comments.

I) We have no comments.

Date: August 6, 2004

Comments Attached

[Signature]
[Handwritten: Robert M. Ing]
Memorandum
N-S Road &
Kapolei Parkway Extension

August 9, 2004

1. This area for the roadway will require a disposition or consent from DHHL, depending on when the conveyance occurs; and

2. (1) 1-017-71, 68 & 88.
   (Parcel 71) - Unencumbered DLNR land. Site of native Abutilon plants.
   (Parcel 88) - DLNR land encumbered by month-to-month revocable permit (RP7329).
   (Parcel 88) - DLNR land encumbered by month-to-month revocable permit (RP7152).

Proposed Kapolei Parkway Extension

This proposed extension will cross over State lands identified as TMK No. (1) 9-1-016/106. Any dispositions from DLNR and/or DHHL will need to be obtained prior to any use of this parcel for the proposed extension.
MENORAH:

TO: XXX Division of Forestry & Wildlife
    XXX Engineering Division
    XXX Division of State Parks
    XXX Commission on Water Resource Management
    XXX Office of Conservation and Coastal Lands
    XXX Land-Oahu District Land Office
    XXX Land-Planning and Development

FROM: Diane E. Mania, Administrator
       Land Division

SUBJECT: North-South Road and Kapolei Parkway

        H-1 Freeway to Pohiha Road, Ewa, Oahu

        Project No. SH-00-120-Residential

        Please review the document pertaining to the subject matter and
        submit your comments (if any) on Division letterhead signed and
dated by the suspense date.

        Notes:
        One copy of the document is available for your review in the
        Land Division Office, Room 220.

        Should you need more time to review the subject matter, please
        contact Ms. broccoli at 687-0324. If this office does not receive
        your comments by the suspense date, we will assume there are no
        comments.

        We have no comments.

        Date: JL-0-028
        Signed: [Signature]
        Division: State Parks
        Name: Daniel L. Quan

        Comments attached.
July 21, 2004

Rodney Haraga

Department of Transportation
Highways Division
801 Punchbowl Street
Honolulu, HI 96813

Attn: Helen Sagen

Subject: Draft environmental assessment (EA), North-South Road & Kapolei Parkway

We have the following comments to offer:

Significance criteria: The analysis for this criterion is individually limited but collectively has considerable effect upon the environment or involves a commitment for larger actions, should be expanded in the final EA. It does not appear that a proposed project will lead to cumulative impacts, thus an environmental impact statement must be prepared. If you find this is not the case for this project include an additional analysis giving your reasons why.

Finding: In the final EA indicate the percentage of federal, state and local money involved.

Terminology: Section 3.3.1.1.6 Traffic Conditions, contains the terms “wearing pavement” and “wearing portion.” In the final EA define those terms.

Exclusion of farms: Where will the farms be relocated to?

If you have any questions, call Nancy Steinhart at 586-4181.

Sincerely,

Genevieve Salminger

Director

cc: Wayne Yoshida, Patricia Bracknoff
The Honorable Genevieve Salmonson
Page 2

The analysis provided in Chapter 5, regarding whether the project would cause a significant cumulative impact on the environment, will be revised. The proposed action is a complex project with logical terminus and does not lead directly to other highway projects. The proposed action will not cumulatively have a considerable effect on the environment.

2. The requested information will be included in the project’s Final Environmental Assessment. Eighty percent of the rights-of-way and construction costs for the North-South Road would be provided by the Federal government and twenty percent would be provided by the State. Eighty percent of the construction costs for Kapolei Parkway would be provided by the Federal government and twenty percent would be provided by the City and County of Honolulu.

3. The text in Section 3.3.1b will be revised in the following matter so that it would be easier to understand (new text underlined) *Northbound traffic . . . weave (vehicles

We appreciate your continued assistance, and if any other questions or problems arise, please feel free to contact us at your earliest convenience.
MEMORANDUM

TO:        John T. Harrison
            Director, UH Environmental Center

FROM:      Pano D. Prevedouros, Ph.D.
            Associate Professor

SUBJECT:   North-South Road Study - Revised Draft EA

The study was reviewed by two PhD students specializing in traffic engineering and myself. The traffic component of this Environmental Assessment and the detailed analyses in the Appendix Volume are properly done and documented. There is abundant evidence in this analysis (and in many reports) about traffic levels of service E and F on movements that carry over 2,000 vehicles per hour. This project is overly needed for the Kapolei, Ewa and Ewa Beach communities at the present time. The 2035 projections are unnecessary proofs of necessity, so any possible concerns about forecasting errors or assumptions are mute. Incidentally, this highway development will benefit any future expansion of the UH in central Oahu by providing an interchange abutting the proposed site of the new UH campus.

Ms. Panos D. Prevedouros, Ph.D.
Associate Professor
Department of Civil and Environmental Engineering
University of Hawaii
2540 Dole Street, Holman Hall 383
Honolulu, Hawaii 96822-2332

Dear Dr. Prevedouros:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. IHW-0-06-95
Revised Draft Environmental Assessment

Thank you for sending us a copy of your memorandum dated August 18, 2001, which commented on this project and its Revised Draft Environmental Assessment, as prepared pursuant to Chapter 343, Hawaii Revised Statutes.

We appreciate your support of this important project and your assessment regarding the potential benefits of the proposed highways to the West Oahu Campus of the University of Hawaii.

If any other concerns or problems arise, please feel free to contact us.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation
August 16, 2004

Mr. Rodney K. Haraga, Director
Department of Transportation
State of Hawaii
809 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Subject: Your Letter of July 22, 2004 on the Revised Draft Environmental Assessment for the North-South Road and Kapolei Parkway, HI-1 Freeway to Kapolei Road.

Thank you for the opportunity to comment on the subject document.

The construction drawings should be submitted for our approval.

If you have any questions, please contact Joseph Kanua 748-5442.

Very truly yours,

S. Clifford S. Jamil
Manager and Chief Engineer

cc: Office of Environmental Quality Control

Mr. Clifford S. Jamil
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96813

Dear Mr. Jamil:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-0-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 16, 2004, which commented on this project and its Revised Draft Environmental Assessment.

As you have indicated, our final plans for this project will be submitted to the Board of Water Supply, for review and approval.

If any questions or problems arise, please feel free to contact us at your earliest convenience.

Very truly yours,

Rodney K. Haraga
Director of Transportation
August 16, 2004

Mr. Michael T. Amii
Director
Department of Community Services
City and County of Honolulu
715 South King Street, Suite 311
Honolulu, HI 96813

Dear Mr. Amii:

Subject: Draft Environmental Assessment
North-South Road and Kapolei Parkway
Project No. HWY 0-01-92

Thank you for your letter of August 16, 2004, which commented on this project and its Revised Draft Environmental Assessment.

Pursuant to Section 106 of the National Historic Preservation Act, we have consulted with several agencies and individuals, including the State Historic Preservation Division of the Department of Land and Natural Resources, the Office of Hawaiian Affairs, and the Oahu Island Burial Council. Documentation of this consultation will be provided in the project’s final environmental assessment.

We appreciate your support of this project, and if any questions or problems arise, please feel free to contact us at your earliest convenience.

Very truly yours,

Michael T. Amii
Director

Office of Environmental Quality Control
Department of Transportation
August 23, 2004

Mr. Rodney Hauage, Director
Department of Transportation
State of Hawaii
650 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hauage:

Subject: North-South Road and Kapolei Parkway
H-1 Freeway to Nimitz Road, Ewa, Oahu
Project No. HWY-01-01-62

Thank you for the opportunity to review and comment on the Revised Draft Environmental Assessment for the subject project.

Our only comment regarding the project at this time is to increase the proposed 4-foot wide planting strip area noted on the Kapolei Parkway Typical Section, Figure 8-3, to a minimum of 8 feet. In time, the brush and roots of planted trees will overtake the narrow strip and damage the adjacent sidewalks, curbs and gutters.

Should you have any questions, please call Charles Pignataro of our Division of Road Maintenance, at 484-1697.

Very truly yours,

Larry Leopardi, P.E.
Director and Chief Engineer

cc: Office of Environmental Quality Control

Mr. Larry Leopardi, P.E.
Director and Chief Engineer
Department of Transportation
City and County of Honolulu
1600 Leilehua Street, Suite 215
Kapolei, HI 96707

Dear Mr. Hauage:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 23, 2004, which commented on this project and its Revised Draft Environmental Assessment.

Your comment has been submitted to the Department of Design and Construction, City and County of Honolulu, for their review and response. They have indicated that appropriate foliage and groundcover will be planted. In addition, the proposed 4-foot planting strip is consistent with other planned and existing sections of Kapolei Parkway, and because of the limitations of the proposed right-of-way, a wider planting strip may not be possible.

We appreciate your coordination efforts, and if any other problems or questions arise, please feel free to contact us.

Very truly yours,

Rodney Hauage
Director of Transportation
August 12, 2004

Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
809 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Subject: Revised Draft Environmental Assessment (DEA)
North-South Road and Kapolei Parkway
H-1 Freeway to Station Road
Ewa, Oahu, Hawaii
Project No. HWY-03-01-92

We received your letter dated July 22, 2004, requesting our review and comments on the above-mentioned DEA.

The Honolulu Fire Department has no objection to the proposed revisions.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 831-7778.

Sincerely,

JOHN CLARK
Acting Fire Chief

cc: Generoso Salomon, Director
Office of Environmental Quality Control

Mr. John Clark
Acting Fire Chief
Fire Department
City and County of Honolulu
3175 Koapaka Street, Suite H425
Honolulu, HI 96819-1669

Dear Chief Clark:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-03-01-92
Revised Draft Environmental Assessment

Thank you for your letter dated August 12, 2004, which commented on the Revised Draft Environmental Assessment for this project.

We appreciate your review of this document, and if any problems or questions arise, please feel free to contact us.

Very truly yours,

RODRIGUEZ, Director
Office of Transportation
July 28, 2004

Mr. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
868 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Subject: Draft Environmental Assessment North-South Road
and Kapolei Parkway H-1 Freeway to Renton Road, Ewa,
Oahu Project No. HWY-6-01-92

Thank you for the opportunity to review and comment on the Draft Environmental Assessment relating to the North-South Road and Kapolei Parkway.

The Department of Parks and Recreation has no comment on the proposed highway improvements.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-6454.

Sincerely,

WILLIAM D. BALFOUR, JR.
Director

cc: Office of Environmental Quality Control

---

Mr. William D. Balfour, Jr.
Director
Department of Parks and Recreation
City and County of Honolulu
1600 Ulusa Street, Suite 309
Kapolei, HI 96707

Dear Mr. Balfour:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-6-01-92
Revised Draft Environmental Assessment

Thank you for your letter of July 28, 2004, regarding the Revised Draft Environmental Assessment for this project.

We appreciate your review of this document, and if any problems or questions arise, please feel free to contact me.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation
August 12, 2004

Mr. Rodney K. Haraga, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Thank you for the opportunity to review and comment on the Revised Draft Environmental Assessment for the North-South Road and Kapolei Parkway, H-1 Freeway to Rantin Road, Project No. HWY-O-01-92.

This project will have an overall positive impact on the community and services provided by the Honolulu Police Department, as it will alleviate some of the existing traffic congestion in the area.

If there are any questions, please call Captain Gregory Lafont of District B at 692-4253 or Ms. Carol Sodalani of the Support Services Bureau at 529-3658.

Sincerely,

GLEN K. KAJIYAMA
Acting Chief of Police

By

KARL GODDREY
Assistant Chief of Police
Support Services Bureau

cc: CIEOC

Serving and Protecting with Aloha

Mr. Bolsa Correa
Chief
Police Department
City and County of Honolulu
869 South Beretania Street
Honolulu, HI 96813

Dear Chief Correa:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-O-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 12, 2004, which commented on this project and its Revised Draft Environmental Assessment.

We agree with your comment and are appreciative of your support for this project.

If any questions or problems arise, please feel free to contact us.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation
July 29, 2004

Mr. Rud Herring, Director
Department of Transportation
838 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Herring,

I have been in receipt of the:

NORTH-SOUTH ROAD and KAPOLEI PARKWAY
H-1 Freeway to Hanion Road,
Ewa, Oahu, Hawaii

Revised Draft Environmental Assessment

In a perfect world, this thoroughfare would have been completed as soon as possible. The city and state are lagging behind in the design, planning, and construction for the infrastructure required to accommodate the growth in housing, industrial, and commercial expansion proposed.

It is of absolute necessity, that the North-South Road and Kapolei Parkway be completed as soon as possible. Traffic relief is overdue as our area needs are at, or exceeding their carrying capacity.

After careful review of the Revised Draft Environmental Assessment, it is apparent that numerous parties and individuals came together to put this road on the map with the best of intentions and usefulness as soon as it could be done. I applaud the efforts of all those who contributed to bring us to this point and will do everything in my position to assist and ensure funding to make the roadway a reality.

Respectfully,

Willie C. Espero
State Senator

The Honourable Willie C. Espero
State Senator, 26th District
The Twenty-Seventh State Legislature
State of Hawaii
State Capitol
Honolulu, HI 96813

Dear Senator Espero:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-D-01-92
Revised Draft Environmental Assessment

Thank you for your letter of July 29, 2004, which commented on this project and its Revised Draft Environmental Assessment, as prepared pursuant to Chapter 343, Hawaii Revised Statutes.

We agree with your assessment regarding the necessity of the North-South Road and Kapolei Parkway in Ewa and are anxiously anticipating the start of construction. For the North-South Road, in January 2005. The project was recently delayed due to federal requirements involving floodplain management and impacts on the Ewa Village Historic District. These requirements have been met, and consequently, the environmental assessment, as prepared in accordance with the National Environmental Policy Act, will soon be approved and processed.

Your support of this project throughout its development, has been monumental and is sincerely appreciated. In the years ahead, the level of construction funding for this project will be significant and your continuing assistance at the State Legislature will again be needed to assure the completion of the North-South Road and Kapolei Parkway.

If you have any questions or problems, please feel free to contact us at your earliest convenience.

Very truly yours,

Rodney B. Haragá
Director of Transportation
August 20, 2004

Mr. Rodney K. Haraga, Executive
State of Hawaii
Department of Transportation
661 Punchbowl Street
Honolulu, HI 96813

Re: North-South Road and Kapolei Parkway
11-1 Freeway to Pali Road, Ewa, Oahu
Project No. HWY-D-01-92

Aloha,

On behalf of the residents of the Ewa by Gentry Community Association, I appreciate the opportunity to comment in support of Project No. HWY-D-01-92, as described in the Revised Draft Environmental Assessment July 2004.

Our Community has grown very quickly in the past fifteen years, and the additional traffic development in our area has increased the capacity of the service streets to move commuters to, off, and around Ewa Beach. A project to construct the existing sections of Kapolei Parkway, and to begin the North-South Road connection to the H-1 in many years is overdue. While I was aware that our developer, Gentry Homes, is responsible for the construction of Kapolei Parkway through our community, approval for such things as stop lights, stop signs, and pedestrian signals are dependent on the City and State Department of Transportation. I want to call to your attention that the subdivisions of Hi‘ilani, Sun Tanu on the Park, Sun Tana South, Kualani, Del Vida, and Koko Kai are Kapolei Parkway as their way to and from state roads. Additionally, Genter Park is bordered on one side by Kapolei Parkway, utilizing our children and families in such a manner, and now to be placed on the same block, I must express to the strongest possible terms that our community, as you know, expect that approved for stop lights, stop signs, and pedestrian signals will be forthcoming so that those essential safety measures can be placed before the traffic begins to flow along Kapolei Parkway. The residents of Ewa by Gentry do not want repairs of the accidents and injuries that have occurred before Gentry Homes could get approval for traffic safety measures like Genter and Kapolei.

Logic dictates that the traffic flow will support the need for lights, so please facilitate coordination of the approved installation of these essential safety measures so that they can be operational with the opening of new section of Kapolei Parkway.

Sincerely,

[Signature]

Ewa By Gentry Community Association
91-1795 A Kealohala Drive • Ewa Beach, HI 96706 • Tel: (808) 683-0111 • Fax: (808) 683-0114

---

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

Ms. Susan York
Board President
Ewa By Gentry Community Association
91-1795 A Kealohala Drive
Ewa Beach, HI 96706

Dear Ms. York:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-D-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 20, 2004, which commented on this project and its Revised Draft Environmental Assessment.

Since Kapolei Parkway is under the jurisdiction of the City and County of Honolulu, your letter has been forwarded to their Department of Design and Construction, and hence we believe that they are indeed aware of the concerns of your community. They have indicated that a traffic signal for the Kapolei Parkway/Genter Road intersection is currently under design and is expected to be installed soon. Traffic signals at other intersections along Kapolei Parkway, such as at Kualakai Drive, will be implemented when warranted.

We are appreciative of your support for this project, and if any questions or problems arise, please feel free to contact us at your earliest convenience.

Very truly yours,

[Signature]

RODNEY K. HARAGA
Director of Transportation
Mr. Rodney K. Hanaga, Director
Department of Transportation
699 Punchbowl Street
Honolulu, HI 96813

August 23, 2004

Mr. Hanaga:

Re: Project No. HWY-O-01-92

Thank you for allowing Garst Seed Co. to comment on the Revised DEA for the North South Road and Kapolei Parkway. Garst Seed’s interest in the project stems from our cooperative grower agreement with Mr. Larry Jiao and Sugenlal Paniya.

We believe the impact on agriculture as detailed in chapter 3.3 Geology, Soils and Farmland is understated. Actual farmland displaced by the roadway may be minimal but potential negative effects are great.

There appears to be a discrepancy between the two sections of chapter 3. Section 3.2.2 POTENTIAL IMPACTS states that “If it was determined that Pohakua Road will be maintained for vehicle access by ranches, at work the 3-14 Freeway...”

Section 3.2.3 MITIGATION MEASURES states that “Existing unimproved agricultural vehicle crossings of the North South Road will be maintained during construction...”

What appears lacking is a clear statement regarding the Operational Phase, which simply states, “Unimproved agricultural vehicles will be allowed on Pohakua Road...” However, if the project cuts off Pohakua Road at the freeway it effectively sever a critical link between farm locations. This will render several hundred acres of farmland less accessible to our operations.

Sincerely,

Thomas K. Hill
Hawaiian Farms Seed Supervisor
Garst Seed Co.

Cc: Office of Environmental Quality Control
Mr. Thomas Hill
HIWY-PA
2.5571

We trust that your concerns have been addressed, and if any other questions or problems arise, please feel free to contact us at your earliest convenience.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation

Mr. Thomas R. Hill
Hawaii Postal Service
Geor. P. Box 8
Kauai, HI 96719

Dear Mr. Hill:

Subject: North-South Road and Kapolei Parkway

Ewa, Island of Oahu
Project No. HIWY O-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 23, 2000, which commented on the Revised Draft Environmental Assessment (DEA) for this project.

As stated in the Revised DEA, during the project's construction and interim phase, access to Palihuia Road will be maintained, and travel between farms just make and/or make at the H-1 Freeway could be accomplished via Palihuia Road. However, during the ultimate phase of this project, Palihuia Road will be served by proposed improvements for the North-South Road and interchange, and access to farming areas, which are located on either side of the H-1 Freeway, would be accomplished via the North-South Road. The final environmental assessment will be appropriately revised to clarify this issue.
September 7, 2004

State of Hawai‘i
Department of Transportation
808 Punchbowl Street
Honolulu, Hawai‘i 96813-5081

Attention: Mr. Rodney K. Haraga
Director

Gentlemen:

Subject: Draft Environmental Assessment for
North-South Road and Kapolei Parkway
H1 Freeway to Eelele Road, Ewa, Oahu.

Please be advised that The Gas Company, LLC maintains underground utility gas mains in the project vicinity, which serve commercial and residential customers in the area and is interconnected with the utility network in Ewa. We would appreciate your consideration during the project planning and design process to minimize any potential conflicts with the existing gas facilities in the project area.

Thank you for the opportunity to comment on the Draft Environmental Assessment. Should there be any questions, or if additional information is desired, please call Chris Anderson at 594-1564.

Sincerely,

[Signature]

Charles R. Calvet, P.E.
Manager, Engineering

cc: State of Hawai‘i, Office of Environmental Quality Control

Mr. Charles R. Calvet, P.E.
Manager, Engineering
The Gas Company
P.O. Box 2000
Honolulu, Hawai‘i 96802-2000

Dear Mr. Calvet:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY O-91-92
Revised Draft Environmental Assessment

Thank you for your letter of September 7, 2004, which commented on this project and its Revised Draft Environmental Assessment.

We realize that the proposed North-South Road will be crossing your gas mains. At the appropriate time, our project personnel will be contacting you to determine the precise location of these mains and whether they can be avoided.

We are appreciative of your continued support of this project, and if any other questions or problems arise, please contact us at your earliest convenience.

Very truly yours,

[Signature]

RODNEY K. HARADA
Director of Transportation
August 24, 2004

Mr. Rodney Hanaoa
Director
State Department of Transportation
160 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hanaoa:

We have reviewed your Revised Draft Environmental Assessment on N-S Road and Kapolei Parkway, Ewa, Oahu. We agree that your project would not negatively affect the ORAI Right of Way and appreciate the department’s consideration of the best interest of the “well preserved” corridor of the railroad track.

We met a couple of years ago with the City and County’s design and planning on the railroad crossing at Kapolei Parkway. The County agreed to include automated crossing gates in the future project and we agreed to maintain them.

We wonder if Kamehameha will be extended in the future to Pali Road. The maps in the revised EA do not show the connections between Kamehameha and Kamehameha which was put in place about two years ago.

Thank you for the opportunity to comment.

Sincerely,

ROBERT YATCHENOFF
President

HAWAIIAN RAILWAY SOCIETY
A Chapter of the National Railway Historical Society
P.O. Box 32085 • Ewa Beach, Hawaii 96775 • (808) 681-3481 • Fax (808) 681-4500

Mr. Robert Yatchenoff
President
Hawaiian Railway Society
P.O. Box 63159
Ewa Beach, HI 96706

Dear Mr. Yatchenoff:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-O-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 24, 2004, which commented on the Revised Draft Environmental Assessment for this project.

For your information, the Kapolei Parkway section that includes the railroad crossing is not a part of this project. However, we have been in contact with the City and County of Honolulu, Department of Design and Construction, and they have indicated that supporting infrastructure for the automated crossing gates will be provided in Phase 3A of their Kapolei Parkway project; the automated gates will be installed when warranted.

In response to your second comment, the State of Hawaii and City and County of Honolulu do not currently have plans to extend Kamehameha to Fort numbers Ewa. In addition, due to map size and scale and the lack of an official designation, it was decided to omit the connector road between Kamehameha and Franklin D. Roosevelt Avenue.
We are appreciative of your confirmation that this project will not negatively impact the O‘ahu & L.E. right-of-way. If you have any other questions or concerns, please feel free to contact us at your earliest opportunity.

Very truly yours,

RUDOLPH K. HIRAGA
Director of Transportation

August 18, 2004

Mr. Rodney K. Hiraga, Director
State of Hawaii
Department of Transportation
609 Punchbowl Street
Honolulu, HI 96813

Re: Revised Draft Environmental Assessment North South Road and Kapolei Parkway

Dear Mr. Hiraga,

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Proposed North-South Road and Kapolei Parkway. We would like to offer the following comments:

- Park-and-ride high occupancy vehicle (HOV) lanes should be included to maximize occupancy, which would result in higher average vehicle occupancy and, therefore, more efficient use of the roadway system.

- More details should be provided regarding the bicycle facilities. How wide will the paths be? Will they be paved? Where will they be located and how will they connect? Will a separate crossing be required?

- The proposed Park & Ride lot at the H-1 interchange should be constructed as part of this project, rather than waiting for the regional BRT project which is at least 10 years away from fruition.

Thank you again for the opportunity to comment on this document. We are hopeful that this project will include important transportation demand management facilities to encourage and promote alternative transportation choices for the area community.

Sincerely,

Mindy Norris
Transportation Manager
Ms. Mindy Norris  
Program Manager  
Kawainui-Oahu Transportation Management Association  
200 Bishop Street, Suite 1976  
Honolulu, Hawaii 96813  

Dear Ms. Norris:  

Subject: North-South Road and Kapoli Parkway  
Ewa, Island of Oahu  
Project No. HWY-O-01-92  
Revised Draft Environmental Assessment  

Thank you for your letter of August 9, 2004, which commented on the Revised Draft Environmental Assessment (DEA) for this project.  

We have the following responses for each of your comments, and these responses have been placed in a corresponding order:  

1. Peak hour High Occupancy Vehicle (HOV) lanes are not currently being considered for this project. However, the design of the completed North-South Road and Kapoli Parkway would be very conducive to the implementation of HOV lanes, and HOV lanes could be provided when warranted.  

2. Information on the width and location of the proposed bike path along North-South Road was provided in Section 2.1.2.1 of the Revised DEA. As will be indicated in the final environmental assessment, the bike path will be paved and no special crossings for the bike path are anticipated.
August 23, 2004

Mr. Rodney Haraga, Director
Department of Transportation
State of Hawaii
800 Punchbowl Street
Honolulu, Hawaii 96813

Ms. Cheryl Soon, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

SUBJECT: NORTH SOUTH ROAD AND KAPOLEI PARKWAY

Dear Mr. Haraga and Ms. Soon:

We have reviewed the Revised Draft Environmental Assessment (EA) for the subject project and offer the following comments:

1. We support implementation of the subject project.
2. We advocate the Final EA include a Finding of No Significant Impact, thus eliminating the need for preparing a State Environmental Impact Statement. This project has been studied and reviewed for 20 years, and the benefits far outweigh the adverse impacts.
3. This project is clearly needed for our Region and we strongly support the expedited construction of this important Road and Parkway.

We appreciate you providing us the opportunity to comment, and trust you will move this project to completion as fast as possible. We look forward to a cooperative working relationship with both your agencies in striving to resolve the transportation issues in the West Honolulu region.

Sincerely,

Randall K. Fujiki, FAIA
Executive Vice President
Ko Olina Development, LLC

cc: Office of Environmental Quality Control
OFFICE OF CAPITAL IMPROVEMENTS

September 16, 2004

Mr. Rodney H. Hara, Director
State of Hawai‘i
Department of Transportation Services
53 Punchbowl Street
Honolulu, HI 96813

Ms. Cheryl Suen, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 9th Floor
Honolulu, HI 96813

Dear Mr. Hara and Ms. Suen:

SUBJECT: NORTH-SOUTH ROAD AND KAPOLEI PARKWAY, H-1 FREEWAY TO RENTON ROAD REVISED DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for providing the University with an opportunity to comment on the Revised Draft Environmental Assessment (EA) for the North-South Road and Kapolei Parkway, H-1 Freeway to Renton Road project. The University recognizes the importance of the North-South Road as a key component in the successful development of a transportation network within the West region. For these reasons, the University is very supportive of this project.

Based on our review of the Draft EA, we offer the following comments:

1. Land Dedication for Right-of-Way Requirements (Section 2.1.2.2.3.1.1.b): The Draft EA identifies an area of 7.7 acres in the north-east quadrant of the North-South Road interchange that will be acquired from the University of Hawaii by the Department of Transportation (DOT) for the right-of-way to construct the roadway. The Draft EA also identifies the following Tax Map Key parcels 9-1-16129, 9-1-16130, and 9-1-16127 that are under the ownership of the University and potentially affected by the land acquisition. Please identify on the map the area required from the University so that we can incorporate this information into our planning efforts.

2. Presentation of the UH West Oahu Campus (Section 3.1.1.2): In July 2004, the University of Hawaii’s Board of Regents adopted, in principle, the Long Range Development Plan for the UH West Oahu campus. The initial phase of the campus, anticipated to be completed in the Fall of 2008, has an initial student population of 1,520 students and a staff of 350. The LRDP identifies an ultimate phase of campus development with a student population of 7,500 and a staff of 1,000, occupying approximately 97 acres of land. To help finance construction of the campus, the University is considering a public/private partnership to develop up to an additional 120 acres of land adjacent to the campus. The land uses envisioned include a mixed-use village, commercial, and residential uses. By rezoning 23 acres of land is allocated for roads, open space, parks, an elementary school and other one-income generating land uses. The development of all or a portion of the 120 acres of land included in the public/private partnership could commence prior to, or about the same time as, development of the initial 1,520 student campus.

Thank you for providing the opportunity to comment on the Draft EA. We look forward to further collaboration with you on this project. If there are any questions regarding these comments, please feel free to contact me at 956-7935.

Sincerely,

[Signature]

Assistant Director
Office of Capital Improvements
Ms. Jan Yokota  
Director of Capital Improvements  
Office of Capital Improvements  
University of Hawaii  
1951 East West Road  
Honolulu, Hawaii 96822  

Dear Ms. Yokota:  

Subject: North-South Road and Kapolei Parkway  
Ewa, Island of Oahu  
Project No. HWY-O-61-92  
Revised Draft Environmental Assessment  

Thank you for your comments in your letter of September 16, 2004 on the Revised Draft Environmental Assessment for the North-South Road and Kapolei Parkway Project. Our proposed project extends from the H-1 Freeway to Mission Road in the Ewa region of Oahu, Hawaii.  

Enclosed is a copy of your written comments, which have been numbered. We would like to provide the following responses to these comments.  

Response 1: As part of the ongoing design efforts, we will work directly with you and your agency to convey information about land acquisition requirements from the University of Hawaii.  

Response 2: Thank you for this information. We will update Section 3.1.1.2 of the Final EA to include this information.  

We will be completing a Finding of No Significant Impact for this project, and will be completing the project's Final Environmental Assessment.
Mr. Rodney K. Haraga, Director
State Department of Transportation
September 9, 2004

Revised Draft Environmental Assessment
For North-South Road and Kapolei Parkway

Here are our comments on the above project, as requested by your letter dated July 22, 2004. First, our traffic engineers have the following comments:

1. The roadway cross-section for the City’s portion of Kapolei Parkway should be consistent with the sections of the roadway that have already been constructed. This means providing a wider shoulder or sidewalk area on the outside of the roadway. Your proposed cross-section reflects an eight-foot shoulder with a four-foot concrete sidewalk. Yet, based on the current subdivision roadway standards, the width of the shoulder should be twenty feet. Thus, the road right-of-way should proportionately increase to 128 feet.

2. At the intersection of Kapolei Parkway and North-South Road, there should be a double right turn in the southbound direction, exclusive of the three through lanes. The ultimate design of the intersection should include raised and channelized islands to facilitate pedestrian movement. The anticipated jurisdiction of this intersection should also be specified.

3. Consideration should be given to the possible extension of North-South Road tracts of Kapolei Parkway to provide an additional point of connectivity in the Kalaeloa area, and provisions for the design of the intersection should be made accordingly.

4. Interchange connection and access points to North-South Road should be identified and the roadway sections specified, since these intersections will most likely be constructed at the time the North-South Road is built. The spacing between these

5. On Kapolei Parkway at its approach to North-South Road, a forty-mile-per-hour design speed should be utilized for design purposes with regard to horizontal and vertical curvature and taper lengths for all exclusive turning lanes.

6. Preliminary roadway plans for the entire length of the facility should be submitted for review prior to preparing subdivision applications for these roadways. These plans should generally identify lane widths, lengths of right-turn auxiliary lanes and left-turn storage lanes, bicycle facilities, pedestrian walkways and access points and crosswalks and/or stop lines.

Second, we note the following minor errors and inconsistencies:

- The report should be revised to reflect the fact that the State Land Use designation in the 570 acre area of Kalaeloa was changed from agricultural to urban in 1999 under Docket AS-726, on page 3-9, line 10-14, and 3-10, line 7-13.

- The report should be revised to indicate that a Special Area Plan for the former Barbers Point Naval Air Station has in fact been adopted (p. 3-71 upper). The Honolulu City Council adopted the Kalaeloa Redevelopment Plan by Resolution 01-06.

- The report should make clear that the section of the secondary urban center, on pages 1-4, 3-3, and 3-3. As shown on the General Plan map adopted by Resolution 03-205, CBD, the secondary urban center includes the City of Kapolei, Koa Olana Phase 1 and 2, the Barbers Point Harbor area, Kapolei Business Park, and Campbell Industrial Park. Also, the five aviation serving the City of Kapolei are located in Makakilo and the Kapolei Business Park (pages 3-13).

- The Ewa Development Plan should be dated August 1997, and was amended May 2000 (p. 3-5, line 10). Page 3-14 correctly states that the Ewa DP was revised in 2000. The changes provided for a Five-Year Review of the Ewa DP.

- The DPU should discuss the accommodation of a planned transit corridor along the North-South Road as shown and discussed in the Ewa DP.

- Ewa also has its own green belt, in addition to the green belt mentioned on p. 3-17 upper.
The executive summary (pages 5.10 to 5.11) should be updated to match the text on the type of interchange being proposed (“modified partial cloverleaf”), the location of the intersection of North-South Road and Kapolei Parkway, and the State's ownership of a portion of the North-South Road right-of-way.

The report should be revised to make pages 2-20 and 2-23 consistent on how familiar the selected type of interchange is to drivers.

For the No-Build Alternative, the Makaha Drive extension can only feed into Pennington Highway, since there is an interchange under this alternative (page 5.12, 2.3 bottom, etc.). Also, the No-Build write up should indicate the lack of access to UH West Oahu and other nearby uses, in Section 3.1.4.

The median strip for the North-South Road is shown on the drawings on page 2-8 as 22 feet wide, not 20 feet wide as stated on page 2-7.

Should you have any questions, please call Mike Watkins of our staff at 533-4406.

Sincerely yours,

Mr. Eric G. Crispin, AIA
Director of Planning and Permitting

Department of Transportation Services
Office of Environmental Quality Control

Mr. Rodney K. Hara, Director
State Department of Transportation
September 9, 2004
Page 3

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
809 POINCIANA STREET
HONOLULU, HAWAI'I 96813

Mr. Eric G. Crispin, AIA
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Crispin:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. HWY-O-81-02
Revised Draft Environmental Assessment

Thank you for your letter of September 9, 2004, which commented on this project and its Revised Draft Environmental Assessment (DSEA).

We have the following responses to each of your comments, which have been placed in a corresponding order:

1. We agree that the typical section for the proposed Kapolei Parkway segment should be consistent with the typical sections of existing portions of Kapolei Parkway. The roadway cross section in Ewa by Green has a total right-of-way width of 116 feet, which matches the roadway cross section for Phase 8a of the Kapolei Parkway project, from the Oahu WAH right-of-way to Hilden Road. It should be noted that the 116-foot right-of-way for Kapolei Parkway was established as early as 1994.

In addition, the American Association of State Highway Transportation Officials have indicated that design elements should be maintained throughout a facility. Consequently, since the existing mainline segments of Kapolei Parkway have 5-foot shoulders and 4-foot sidewalks, the proposed segment of Kapolei Parkway should...
also have 8-foot shoulders and 4-foot sidewalks. If it is required, a modification of the new roadway standards will be requested.

2. Based on the year 2035 traffic analyses for the Build Alternative, the proposed North-South Road/Kapolei Parkway intersection would operate satisfactorily during peak hours, with the westbound approach configured with two through lanes and two exclusive right-turn lanes. We believe that the intersection will be channelized and under the jurisdiction of the State of Hawaii.

3. Although an extension of the North-South Road is reflected in the Ewa Development Plan (Revised 2000), the purposes of proposed extension are not consistent with the purposes of this project, and consequently, the proposed extension of North-South Road should be examined separately. We believe that an access for the proposed extension can be accommodated at the North-South Road/Kapolei Parkway intersection; however, the project should also be coordinated with the Department of Hawaiian Home Lands, whose lands the proposed extension would directly impact.

4. At grade intersections along the North-South Road will be provided at crossings for Kapolei Parkway, the future East-West Connector Road, the development access roadway, mainline of Farrington Highway, and Kapolei Parkway.

5. Your design speed of 60 miles per hour for Kapolei Parkway is reasonable.

6. Preliminary plans for the project section of Kapolei Parkway are being prepared by the City and County of Honolulu (City), Department of Design and Construction. These plans will identify lane widths, lengths of right-turn auxiliary lanes and left-turn storage lanes, bicycle facilities, pedestrian walkways and access points, and mass transit and/or bus stop locations and will be submitted for review.

7. We appreciate receiving this information regarding the change of State Lane Use designation for State owned areas of East Kapolei, from agricultural to urban. It should be noted that our land use development analysis is based on the Ewa Development Plan, which also designates the area's land use as urban. For your information, the GIS information of Department of Planning and Permitting indicates that the East Kapolei area is classified as agriculture.

8. Section 3.4.1.4 of the North-South Road and Kapolei Parkway, Final Environmental Assessment, has been revised to reflect the adoption of the Kalakaua Redevelopment Plan by the Honolulu City Council.

9. As requested, the extent of the Secondary Urban Center will be described in Sections 1.1 and 3.1 of the project's final environmental assessment. In addition, the text of the final environmental assessment will clarify the locations of the area's fire station.

10. As requested, Section 2.1.2.1 of the North-South Road and Kapolei Parkway, Final Environmental Assessment, will be revised to note both the August 1997 publication date of the Ewa Development Plan and the approval of an amendment of this document in May 2000.

11. The North-South Road and Kapolei Parkway, Final Environmental Assessment contains a description of the proposed transit corridor. An exclusive rapid transit corridor will be located within the 26-foot section of the North-South Road. This transit corridor will begin at the H-1 Freeway and proceed north to Kapolei Parkway. At Kapolei Parkway, the transit corridor of the North-South Road will connect to the east-west rapid transit corridor designated for the median of Kapolei Parkway. At various locations along North-South Road, the median may be widened to provide for transit stops.

12. We appreciate receiving this information, which concerns the existence of wells in Ewa.

13. The executive summary of the Revised DEIA and other reports have been updated to reflect the currently proposed interchange configuration, which is a diamond interchange. As indicated in your letter, the description of the location of the North-South Road/Kapolei Parkway intersection will be corrected and the State's ownership of a portion of the North-South Road right-of-way will be indicated.

14. The referenced sections of Chapter 2 of the project's final environmental assessment have been modified to improve the consistency of the description of the preferred interchange configuration. Consequently, driver familiarity with the proposed diamond interchange will be consistently described in various portions of our environmental document.

15. Figure 3.1-1 and Section 2.1.1.1 has been modified to indicate that for the No Build Alternative, there is no access planned from the Makakilo Drive Extension to the H-1 Freeway. We also agree that under the No Build Alternative, access from the H-1 Freeway to the proposed ULI, West Oahu Campus, and other nearby facilities/developments would be improved. However, developments in the Ewa plains area maintain that access to their parcels is still available from Kapolei Parkway, Farrington Highway and etc., under the No Build Alternative, and in
consonance with these statements, the Department of Transportation intends to restrict access along the North-South Road.

The proposed typical section for the North-South Road has been revised and is shown in Figure 2.1.3 of the North-South Road and Kapolei Parkway, Final Environmental Assessment. The North-South Road will be a divided roadway with the medians on both sides separated by a 28 foot wide raised median. At intersections where double turn-arounds are anticipated, the median width will be 6 feet.

We appreciate your thorough review of our Revised DEA, and if any other problems or questions arise, please feel free to contact us at your earliest convenience.

Very truly yours,

RODNEY K. HANAGA
Director of Transportation

91 1315 Hanaa Street
Ewa Beach, Hawaii 96704
23 August 2004

Mr. Rodney K. Hanaga, Director
State of Hawai‘i Department of Transportation
801 Punchbowl Street, Honolulu, Hawaii 96813

SUBJECT: NORTH SOUTH ROAD AND KAPOLEI PARKWAY

Dear Mr. Hanaga:

I will now claim to have reviewed all the pages of the Revised DEA dated July 2004. Here are my quick thoughts about our need for North South Road and Kapolei Parkway:

1. There seems to be more detail about them and fewer in the DEA than there are in almost unrelated demographic details. It is likely that if one examines the demographics more carefully by age cohort and proportion to workforce available, one will project much higher net employment for the proposed roads. My demographic field observations show that Kapolei has a very young population, and the population of elementary schools is increasing by large numbers of elementary schools. In our Ewa Village neighborhood, I see that our elementary school grades of five years ago are now driving cars on familiar streets, and they are driving cars on familiar streets. The property of these younger populations in drive and own cars will be much higher than those parents or grandparents.

2. There is great potential value in keeping the integrity and connectedness of the Ewa Village to O‘ahu Railway landscape (including Hanaa Valley) historic church. This is a case where the present value of the whole historic district is much higher than the reconstruction of historic parks. Any road building should therefore try to help the people of this renowned community save such higher value.

3. I was surprised to learn that the areas which Alcon Farms and another company are leasing right now are not going to be agricultural in the Ewa Long Range Development Plan. When we have to drive through heavy traffic each morning and evening, it is definitely placing the need to use the changing agricultural landscape brought about by the activities of Alcon Farms. Such landscapes have tremendous value in the context of attitudes especially for driving and at your face the day for work or the evening for your family. I hope that these open spaces are kept intact.

I am reminded of the 193 Highway. Many said we did not need it and that it would destroy many things. It is hopeful that the North-South Road and Kapolei Parkway can be built like 193, a boon without heavy toll on the historical and open space landscapes.

Thank you.

Carolyn H. Kauai
Ewa Village Resident
Ms. Carolyn Hibbard
91-1159 Hapuna Street
Ewa Beach, HI 96706

Dear Ms. Hibbard:

Subject: North-South Road and Kapolei Parkway
Ewa, Island of Oahu
Project No. IHWY-O-01-92
Revised Draft Environmental Assessment

Thank you for your letter of August 23, 2004, which commented on this project and the Revised Draft Environmental Assessment.

We have the following responses for each of your comments, which have been placed in a corresponding order:

1. We are appreciative of the information contained in your letter regarding Ewa’s changing demographics, which, in fact, confirms the need for this project and other transportation improvements.

2. Your perspective of the Ewa Sugar Plantation Villages Historic District is shared by many residents of Ewa. The proposed Kapolei Parkway will intersect Renton Road between Waena and Tonney Villages, and the State Historic Preservation Division, of the Department of Land and Natural Resources has indicated the importance of maintaining the “brand view corridor” and feeling of cohesiveness of this community and historic resource. The City and County of Honolulu, Department of Design and Construction, is aware of this objective for the historic district and will undertake appropriate measures.

3. The proposed North-South Road will have minimal direct impact to farmlands. However, other planned regional development for this area will considerably alter land use and the general landscape of Ewa Kapolei. For your information, just east of the North-South Road, between the Ewa Golf Course and Flamingos Highway, large drainage channels and detention basins are planned, and these basins must be kept “open” to control flooding.

We trust that we have satisfactorily addressed your immediate concerns, and if any other questions or problems arise, please feel free to contact us at your earliest convenience.

Very truly yours,

RODEN Y HIL AGA
Director of Transportation
The residents of Varona Village are concerned over the "fire" being drawn between the two villages. The Patuu Road South road will divide Varona from the rest of the village, thus making it easier to forget about Varona Village. The residents will have been able to purchase their homes and have dealt with numerous eviction threats to date. This would make it easier for the City and County to deal Varona Village off to Kapolei. The residents need reassurance this will not be the intent or scope of the project in question. Traffic is a concern, but not the main concern of the residents, that would be losing their homes over this deal.

Please mail/fax/e-mail all comment forms to:
Mr. Rodney K. Harasa, Director, Attn: Mr. Ronald Tsuiki, Department of Transportation, 819 Punchbowl Street, Room 501, Honolulu, Hawaii 96813, Fax No. (808) 587-1197, E-mail Address: ronald.tsuiki@hawaii.gov

Please mail/fax/e-mail all comment forms to:
Mr. Rodney K. Harasa, Director, Attn: Mr. Ronald Tsuiki, Department of Transportation, 819 Punchbowl Street, Room 501, Honolulu, Hawaii 96813, Fax No. (808) 587-1197, E-mail Address: ronald.tsuiki@hawaii.gov
Please make any comments below:

1. I am not going to say anything because  
2. I am not sure what to write about  
3.  
4.  
5.  

Please mail/fax/e-mail all comment forms to:
Mr. Rodney K. Haraga, Director, Attn: Mr. Ronald Tsuzuki, Department of Transportation, 689 Punchbowl Street, Room 301, Honolulu, Hawaii 96813, Fax No. (808) 587-1787, E-mail Address: ronald.tsuzuki@hawaii.gov
Summary of Public Hearing Comments

A public hearing was conducted pursuant to Chapter 343, Hawaii Revised Statutes, on Wednesday, September 1, 2004, 7:00 PM, at the Asing Park Recreational Center in Ewa, Oahu, Hawaii. The following is a summary of the comments received at or in conjunction with the public hearing, and the responses to those comments, which were provided by letter to the individuals listed below. Most of the public testimony, even from those having comments and concerns, was supportive of the project. The specific comments and concerns expressed are categorized by topic, so the names of individuals making more than one comment may appear more than once.

Alternative Alignment for North-South Road

Mr. Glenn Osmilda
91-1179 Puameale St, Apt. V
Ewa Beach, Hawaii 96706-1895

Comment: Suggested an alignment for North-South Road / Kapolei Parkway that would bisect the Ewa Villages Historic District, and have an interchange with the H-1 Freeway one mile west of Kunia Interchange.

Response: The suggested alternative alignment was considered, but was rejected in Section 2.2 of the Revised Draft EA, because it would bisect the Ewa Villages neighborhood, displace several residences in Ewa Villages Historic District, and adversely affect a publicly owned park (Ewa Villages Golf Course).

Mr. Lyle Halverson
91-1145 Kaipu Street
Ewa Beach, Hawaii 96706

Comment: Suggested the extension of North-South Road to Roosevelt Avenue.

Response: While this extension is shown as part of the Ewa Development Plan (Revised 2000), the extension would be beyond the purposes and needs of this project, as stated in the Revised Draft EA. The extension would be rightfully addressed as part of the Kalaæoa Redevelopment Plan with input from the State of Hawaii Department of Hawaiian Home Lands whose land the extension would traverse.

Mr. Will Briones
91-1478 Renton Road, #5
Ewa Beach, Hawaii 96706

Comment: Suggested two “bridges” alternatives to North-South Road – one between Ford Island and Aiea, and the other connecting Aloha Tower, Ewa, and Waianae.

Response: Your first suggested bridge appears to already have been completed: Admiral Clarey Bridge (Ford Island Bridge). Regarding your second suggestion, it is unclear how one would construct such a bridge. Nevertheless, both suggestions would not address the purposes and needs of our project, as stated in the EA.
Endangered Plant - Kooloaula (Abutilon menziesii)

Dr. Kioni Dudley
91-1385 Hauone Street
Kapolei, Hawaii 96707

Comment: Expressed concern about the survival of the endangered Kooloaula found along the road corridor.

Response: The habitat conservation plan (HCP) prepared with the cooperation of several resource agencies is anticipated to propagate the genetic stock of the Kooloaula plants found in the project area. The HCP was approved by the Board of Land and Natural Resources in March of this year, and the U.S. Fish and Wildlife Service concluded in August of this year that implementation of the HCP would result in a net conservation benefit for Kooloaula. Section 3.7 of the Revised Draft EA provides further information on this topic.

Mr. Glenn Oamilda
91-1179 Puamaole St, Apt. V
Ewa Beach, Hawaii 96706-1895

Comment: Asked why testimony provided in a January public hearing was not included in the Revised Draft EA.

Response: The public hearing in January was held by the Department of Land and Natural Resources (DLNR) to obtain comments on the draft habitat conservation plan (HCP) for the endangered Kooloaula (Abutilon menziesii) at Kapolei. The Board of Land and Natural Resources later approved the HCP. The hearing was not conducted by HDOT for environmental review purposes under Chapter 343 of the Hawaii Revised Statutes. Therefore, public testimony provided at the HCP public hearing in January while related to the North-South Road and Kapolei Parkway project, did not need to be documented in the Revised Draft EA.

Varona Village Issues

Ms. Cres Malate
91-1024 Manakuke Street
Ewa Beach, Hawaii 96706

Comment: Suggested closure of the back gate next to the Railway Museum.

Response: Once Kapolei Parkway between Ewa Villages and the Villages of Kapolei is completed, access to and from the back gate may no longer be needed. Residents’ concerns about the connection between the west end of Renton Road and Roosevelt Avenue have been noted by the City, and the City will determine the disposition of that connection at a later date.

Comment: Expressed concern that Kapolei Parkway would isolate Varona Village from the rest of Ewa Villages.
Response: The alignment of Kapolei Parkway will be within the vacant open space area between Varona and Tenney Villages, which also contains a section of Kaloi Gulch. Therefore, construction of Kapolei Parkway will not introduce any more of a gap than already exists. However, when the project is completed, Varona Village residents would have to cross a new intersection when traveling on Renton Road where none exists today. Due to projected traffic volumes, we anticipate the Kapolei Parkway / Renton Road intersection will be signalized when warranted. On the other hand, Varona Village residents would benefit from better access to Kapolei, the H-1 Freeway, and Ewa Beach.

Mr. Patrick Hange
91-1028 Manakuke Street
Ewa, Hawaii 96706

Comment: Expressed concern that Kapolei Parkway would isolate Varona Village from the rest of Ewa Villages.

Response: See response to same comment above from Ms. Cres Malate.

Comment: Wanted to know whether Kapolei Parkway will cause traffic noise impacts in Varona Village.

Response: Based on the noise analysis conducted for this project, as disclosed in Section 3.6 of the Revised Draft EA, we do not anticipate that current Varona Village residents will experience traffic noise impacts from Kapolei Parkway.

Kapolei Parkway Issues

Mr. Lyle Halverson
91-1145 Kaipu Street
Ewa Beach, Hawaii 96706

Comment: Suggested installation of traffic signals at Kapolei Parkway / Geiger Road intersection.

Response: Gentry Homes is scheduled to install a signal at the Kapolei Parkway / Geiger Road intersection within the near future, as a part of a separate project, subject to approval by the City and County of Honolulu.

Comment: Requested information of the party responsible for constructing the segment of Kapolei Parkway between Ocean Pointe and Ewa Gentry.

Response: This segment of Kapolei Parkway will be constructed by Gentry Homes as part of the first phase of the Ewa by Gentry Makai project.

Ms. Tesha Malama
91-818 Lawalu Place
Ewa Beach, Hawaii 96706

Comment: Suggested upgrading Renton Road at its intersection with the future Kapolei Parkway.
Response: The City and County of Honolulu is currently constructing Kapolei Parkway from the OR&L Right-of-Way to Renton Road, as part of a separate project. That project will construct the Kapolei Parkway / Renton Road intersection, including the supporting infrastructure for future traffic signals. When warranted, traffic signals will be installed at this intersection.

Comment: Suggested implementation of traffic measures at intersection of Kolowaka Street and Kapolei Parkway, and at the intersection of Kapolei Parkway and Geiger Road.

Response: The Kapolei Parkway and Kolowaka Street intersection will be signalized when warranted. Gentry Homes is scheduled to install a signal at the Kapolei Parkway / Geiger Road intersection within the near future as part of a separate project, subject to approval by the City and County of Honolulu.

Ms. Cres Malate
91-1024 Manakuke Street
Ewa Beach, Hawaii 96706

Comment: Suggested installation of traffic signals at the Kapolei Parkway / Renton Road intersection.

Response: The City and County of Honolulu is currently constructing Kapolei Parkway from the OR&L Right-of-Way to Renton Road, as part of a separate project. That project will construct the Kapolei Parkway / Renton Road intersection, including the supporting infrastructure for future traffic signals. When warranted, traffic signals will be installed at this intersection.

Landscaping of North-South Road and Kapolei Parkway

Mr. Lyle Halverson
91-1145 Kalpu Street
Ewa Beach, Hawaii 96706

Comment: Suggested that roadway landscaping use plants that do not use very much water or require a lot of maintenance.

Response: Details of the highway landscaping plan will be developed during the project's design phase. Use of plants that would minimize water requirements will be considered.

Systemwide Traffic Congestion Issues

Dr. Koni Dudley
91-1365 Hauone Street
Kapolei, Hawaii 96707

Comment: Suggested that improvements to the H-1 Freeway be done concurrently with construction of the North-South Road / Kapolei Parkway project.
Response: The inclusion of capacity enhancement alternatives for the H-1 Freeway with the proposed project would be beyond the project's purpose and need. There are other projects that are incrementally addressing congestion issues on H-1 Freeway. An example is the widening project for the Waimalu Viaduct near the Waioua Interchange. Moreover, the EA discloses that traffic on the H-1 Freeway, within the study area, is projected to operate at an acceptable level-of-service with the proposed project. Section 3.3 of the Revised Draft EA provides further information.

Ms. Rosemary Angelo
91-1698 Burke Street
Ewa Beach, Hawaii 96706

Comment: The North-South Road and Kapolei Parkway project would contribute to the abundance of traffic signals in the area and related traffic congestion.

Response: Traffic signals are necessary for the safe and efficient operation of intersections along North-South Road and Kapolei Parkway. We agree that unnecessary traffic signals should not be installed, and any traffic signal will be installed only after warrants are satisfied.

Comment: Concerned about pedestrian safety.

Response: Pedestrian and bicyclist safety is a high priority in the planning of roadways. Pedestrian-friendly features have been incorporated into the proposed roadway designs, including sidewalks, traffic signals, and bike facilities.

General Support for the Project

The Honorable Senator Willie Espero
State Capitol, Rm 96813

The Honorable Representative Mark Moses
State Capitol, Rm 310
Honolulu HI 96813

Mr. Philmund Lee
Representative Romy Mindo
State Capitol, Rm 303
Honolulu HI 96813

Mr. Todd Apo
92-1461 Aliinui Dr 23C
Kapolei HI 96707

Mr. Tony Becker
91-1073 Kaiko Street
Ewa Beach HI 96706
Ms. C.C. Curry
IACC Organization
91-1476 Renton Rd #10
Ewa Beach HI 96706

Mr. Coby Lynn
91-1139 Hanakahi Street
Ewa Beach HI 96706

Mr. Louis Maria
91-1216 Renton Road #Z
Ewa Beach HI 96706

Ms. Sai Tagovailoa-Amosa
91-1145 Ha'ano Place
Ewa Beach HI 96706

Other - No Substantive Comments

Mr. and Mrs. Demetrios Balala
91-1034 Manakuke Street
Ewa, Hawaii 96706
APPENDIX B

CORRIDOR ALTERNATIVES REPORT
# NORTH-SOUTH ROAD/KAPOLEI PARKWAY CORRIDOR STUDY

Ewa, Oahu, Hawaii
Project No. HWY-0-01-92

# CORRIDOR ALTERNATIVES STUDY

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May 1998

PARSONS BRINCKERHOFF KAKU ASSOCIATES R.M. TOWILL CORPORATION
1. INTRODUCTION

The designation of the Ewa region as the "second city" of Oahu in the General Plan provides an alternative area for the growth of population and employment outside the Primary Urban Center and the Central Oahu Development Plan areas. Figure 1 illustrates this area. Within the past ten years, there has been significant growth in population and, to a lesser extent, in employment as development, sometimes aided by government, responded to the policy directive.

As a result, existing traffic analyses of the Ewa region indicate that there are currently, major instances of traffic congestion occurring at the Makaha and Kauai Interchanges on the H-1 Freeway during the peak traffic periods of the day. This congestion extends down the Kauai Road/Fort Weaver Road corridor into Ewa. Roadway improvements are clearly needed today to lessen the impact of this congestion.

Planning for the Ewa region has also identified infrastructure needs to support the projected growth in population and employment yet to occur. Planning studies such as the Ewa Regional Transportation Master Plan and the Oahu Regional Transportation Plan identified the need for major new transportation facilities within the Ewa region.

The proposed North-South Road is one of the elements identified through these studies. It has the potential for relieving both current and projected traffic congestion in the region and provides an important element in the sub-regional transportation circulation.

This study evaluates three alternative corridors that have been identified through the public participation process and determines that at least one of these corridors is a viable proposal and should be further developed.
II. DEFINITION OF SYSTEM ALTERNATIVES

Three system alternatives were identified:

- **No-Build Alternative**
- **Transportation Systems Management (TSM) Alternative**
- **Build Alternative**

The **No-Build Alternative** represents a minimal approach to satisfying the purposes and needs of the project. It assumes that the proposed North-South Road is not constructed between the H-1 Freeway and Kapolei Parkway, and that no additional access is provided to the H-1 Freeway between the Kona and Makakilo Interchanges. It does assume long-range improvements to H-1 Freeway, Fort Weaver Road, Fort Baretto Road, Farrington Highway, and Kapolei Parkway as documented in the **Hawaii Regional Transportation Plan**, entered by the Oahu Metropolitan Planning Organization in November, 1979.

The **Transportation Systems Management (TSM) Alternative** in this study is defined as the provision of a higher level of transit service to the Ewa region. The No-Build alternative assumes a 715-bus fleet by the year 1980, while the TSM alternative assumes a larger fleet of 1,000 buses with much of the increased bus fleet emanating service in the Ewa and Leeward areas.

The **Build Alternative** assumes that a transportation corridor and access to H-1 Freeway would be constructed between the Kona and Makakilo Interchanges. There are three corridor alignment alternatives identified through community and governmental agency input:

- Fort Weaver Road Corridor,
- Ewa Village Corridor, and
- Pearl City Corridor.

Figure 2 illustrates the corridor alignment alternatives. This study report focuses on the evaluation of these three corridor alignment alternatives with the intent to identify at least one corridor which would be representative of the Build alternative for comparison with the No-Build and TSM system alternatives.
III. DESCRIPTION OF CORRIDOR ALIGNMENT OF THE BUILD ALTERNATIVE

The three corridor alignment alternatives were identified through discussions with community organizations representing the Ewa region and through discussions with government agencies responsible for planning in this area. The alternatives are:

- Fort Weaver Road Corridor.
- Ewa Villages Corridor.
- Pali High Corridor

A. Fort Weaver Road Corridor Alternative

This alternative would utilize the existing Fort Weaver Road corridor by upgrading the existing four-lane divided roadway to a four-lane divided road from Farrington Highway to Geiger Road. The alternative was developed in response to public and agency comments that suggested maximizing capacity within the Fort Weaver Road corridor as an alternative to constructing a new north-south roadway within the study area.

Future plans already recommend increasing the number of lanes on Fort Weaver Road from 4 to 6 lanes. This widening improvement is included in the Oahu Regional Transportation Plan in addition to constructing a separate North-South Road. Clearly, utilizing this corridor as an alternative to constructing a new North-South Road would require an enhancement above and beyond the 6-lane widening. Consequently, a 4-lane freeway with access regulated by grade-separated interchanges was identified as a way to accomplish this without major property acquisition along the Fort Weaver Road corridor. The 4-lane freeway configuration provides more traffic-carrying capacity than a 6-lane arterial roadway and can provide this within a comparable right-of-way except at interchanges.

In this alternative, grade-separated interchanges would be constructed at Geiger Road, Rani Road, a new East-West Development Road, and Lualaulu Drive (West Loch Estates). No new access point would be provided on the H-1 Freeway between the Koolau and Makaha Interchanges.
Additional right-of-way would be needed at these four interchange locations to accommodate the on and off ramps. Figure 3 shows the proposed corridor configuration and identifies some preliminary issues within the Fort Weaver Road corridor.

**B. Ewa Villages Corridor Alternative**

This corridor alignment provides a direct route from the Ewa and Ewa Beach areas to the proposed new North-South Road interchange with the H-1 Freeway. It is assumed to be a 6-lane arterial roadway with at-grade intersections. This alternative resulted from Ewa and Ewa Beach community requests to evaluate a "more direct" alignment of North-South Road than the alignment shown in the Ewa Regional Transportation Master Plan and the Oahu Regional Transportation Plan (ORTP). Two specific alignments were suggested by the public in meetings of the Ewa Neighborhood Board and the Ewa Beach Community Association.

One of the Ewa Villages Corridor alternative alignments identified through the public involvement process provides the most direct route from Ewa Beach through the Ewa Villages development to H-1 Freeway. For discussion purposes, this is labeled Sub-Alternative A. It would begin at the tangent portion of existing Kapolei Parkway between Gage Road and Kalaewa Drive, adjacent to the Ewa by Century development. The alignment would continue to the northwest, cutting through the Ewa by Century development and the Ewa Makanu Park. The alignment would then enter the Ewa Villages Historic District and parallel Pepper Row, cutting across the existing Ewa Villages Golf Course and the currently vacant Ewa Villages housing lots.

Another alignment, labeled Sub-Alternative B, would begin where the extension of Park Row would intersect Kapolei Parkway. The Oahu Railway & Land (OR&L) Right-of-Way passes through this intersection. The alignment would then follow the Park Row alignment north through the Ewa Villages Historic District and cross the existing Ewa Villages Golf Course freeway.
Both sub-alternative alignments would join together upon leaving the Ewa Villages Historic District and proceed towards the existing Palahoa Road and the proposed interchange location on the H-1 Freeway. Figure 4 shows the two sub-alternatives and highlights areas of concern. These two sub-alternatives are both evaluated in this analysis.

C. Palahoa Corridor Alternative

This corridor alternative would intersect Kapolei Parkway in the vacant area between the existing "Villages of Kapolei" development and the Ewa Villages development. The alignment would proceed north to the proposed interchange at H-1 Freeway. As much as possible, the alignment would utilize an existing easement that was set aside for a major north-south roadway as part of sub-regional planning efforts in the Ewa region. This easement also accommodates existing Hawaiian Electric Company (HECO) 128 kV transmission towers and is planned to accommodate a realigned Kalo Gulch. A 6-lane, divided arterial with at-grade intersections is assumed for this alternative.

This corridor has been included in many development plans. The Kapolei Urban Renewal Master Plan, the original planning documents for the University of Hawaii - West Oahu Campus, and the current planning efforts of the Housing Finance and Development Corporation (HFDC) consistently show this conceptual alignment for the road. The ORTP, while not specific with regard to alignment, also indicates a North-South Road within this area. All of the lands traversed by this corridor alignment are currently undeveloped. Figure 5 shows the corridor alternative configuration.
IV. EVALUATION OF CORRIDOR ALTERNATIVES

The three corridor alignment alternatives were compared in four areas: 1) Community Impacts, 2) Right-of-Way Needs, 3) Construction Cost and 4) Travel Benefits. Community impacts refer to the physical impacts to buildings, properties, and special features of the corridor alignment alternatives. Right-of-way needs identify the right-of-way required to implement an alternative. Preliminary construction cost estimates facilitate the comparison of implementation cost between the alternatives. Travel benefits reflect the usefulness of the alternative in regard to transportation circulation and congestion relief.

A. Community Impacts

Four community impact elements were evaluated: 1) Property, 2) Access, 3) Aesthetics, and 4) Recreational/Historic. Property impacts refer to the number of structures impacted by a corridor alignment. Access impacts identify access implications of a corridor alignment. Aesthetic impacts consider the visual and community impacts as a result of developing an alignment alternative. Recreational/Historic impacts identify facilities protected by law that are impacted by a corridor alignment.

1. Fort Weaver Road Corridor

Property Impacts

This corridor alternative was configured to minimize physical impacts to properties adjacent to Fort Weaver Road by keeping the east-west cross streets at grade, while grade-separating Fort Weaver Road over them. This minimizes disruption to access points along the cross streets. However, even using a Y-shaped interchange configuration which utilizes as little as 250-foot spacing between ramp terminal intersections, it appears that about 8 residential units would be displaced on the north side of Fort Weaver Road at Geiger Road. Additionally, 1 business is likely to be displaced on the north-east quadrant of the Fort Weaver Road/Geiger Road interchange.
Access impacts

The implementation of interchanges for access to Fort Weaver Road will impact access to Fort Weaver Road. The number of interchanges along Fort Weaver Road will be constrained by minimum interchange spacing criteria. As a result, two existing east-west cross streets will lose direct access to Fort Weaver Road: Kelawai Drive and Ota Fort Weaver Road. Grade separations are proposed to provide cross-street continuity, and access to Fort Weaver Road will be regained to cross streets with interchanges.

Aesthetics

The construction of massive grade-separated interchanges along Fort Weaver Road will have visual impacts within the heavily built Ewa Plain area.

Recreational/historic impacts

This corridor alternative is not likely to have either recreational or historic impacts as it is mostly contained within an existing roadway right-of-way.

2. Ewa Villages Corridor Alternatives

Property

The Ewa Villages Corridor Alternatives would have significant property impacts. Sub-Alternative A would displace at least 118 existing residential dwellings within the Ewa by Gentry subdivision and 10 residences within the Ewa Villages Historic District along Pohakulane Street. Thirty-four vacant residential lots along the Ewa Villages Golf Course will also be displaced. This option would also impact a recreational center in the Ewa by Gentry development. A commercial building on the south side of Renton Road that houses the Friends of Ewa organization will also be impacted. Sub-Alternative B also has fewer direct physical impacts to the Ewa by Gentry and Ewa Villages developments. It would impact 6 existing residences within the Ewa Villages Historic District along Park Row and 24 vacant residential lots along the Ewa Villages Golf Course.

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North-South Road Corridor Study Ewa Alternatives Study

Access

In both sub-alternatives, access to adjacent properties will be modified. Intersection spacing requirements for a principal arterial road will limit the frequency of access to the proposed North-South Road. This will require that cross-street access to North South Road be closed within the Ewa Villages Historic District neighborhoods.

Aesthetics

Locating a principal arterial roadway in a neighborhood and recreational area is likely to impact the area aesthetically, especially in the areas of noise and change in character.

Recreational/historic impacts

Both sub-alternatives will pass through the Ewa Villages Historic District which is currently on the State of Hawaii Register of Historic Places and has been nominated for the National Register of Historic Places. This will trigger Section 106 of the National Historic Preservation Act of 1966 and Section 4(f) of the Department of Transportation Act.

Both Sub-Alternative A and Sub-Alternative B will impact the Ewa Villages Golf Course thereby triggering Section 4(f) relating to impacts on recreational facilities. Mitigation will require major modifications to the existing Ewa Villages Golf Course including grade separation of North South Road below grade under the freeway. Sub-Alternative A will also directly impact Ewa Mahana Park, creating a Section 4(f) impact there as well.

3. Kaneohe Corridor Alternative

Property

The Pali Highway Corridor Alternative does not have property impacts since the land through which the alignment is proposed is vacant.

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Access

Proposed access along the Paepaeu Corridor is appropriate for a principal arterial
Fanning Highway and Kapolei Parkway will be major intersections. Intersections
between these two points are being planned as part of future development of the area
and their frequency and location can be adjusted to appropriate points along the
proposed North-South Road.

Aesthetics

There is sufficient land available to implement appropriate landscaping along the
Paepaeu Corridor to create a pleasant driving environment.

Recreational/Historic Impacts

There are no recreational or historic sites within the Paepaeu Corridor.

Table 1 summarizes the community impacts associated with the Fort Weaver, Eva
Villages, and Paepaeu Corridors.

Table 1

Corridor Alignment Alternatives
Community Impacts

<table>
<thead>
<tr>
<th>Corridor Alternative</th>
<th>Property-Residential Units</th>
<th>Property- Businesses</th>
<th>Access - Cross- Streets Affected</th>
<th>Recreational/ Historical Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Weaver Road Corridor</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eva Villages Corridor, Sub-Alternative A</td>
<td>422</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Eva Villages Corridor, Sub-Alternative B</td>
<td>22</td>
<td>0</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Paepaeu Corridor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

As shown in Table 1, the Paepaeu Corridor Alternative has the fewest community
impacts.

B. Right-of-Way Needs

Right-of-way needs refer to additional right-of-way that needs to be acquired above
and beyond what exists today.

1. Fort Weaver Road Corridor Alternative

The Fort Weaver Road Corridor will require additional right-of-way at the proposed
interchange locations. The mainline should be able to fit within the right-of-way already
reserved in anticipation of widening Fort Weaver Road from 4 to 6 lanes. The
interchange right-of-way impacts were determined assuming right of way
interchanges with 200-foot spacing between ramp terminal intersections. Right-of-way
requirements were minimized by shifting the alignment within the existing corridor and
by eliminating the median area. Relocating vaults were assumed where necessary to
reduce the amount of right-of-way needed.

2. Eva Villages Corridor Alternative

The Eva Villages Corridor is the greatest right-of-way requirements. Both sub-
alternatives will require additional right-of-way in the existing Eva Villages. The
crossing of the Eva Villages Golf Course may require some type of grade separation
under the golf course faraway. If the grade separation is needed, the approaches to 4
will also impact existing cross streets, requiring additional access roadways and then
associated right-of-way to maintain access to areas served by the cross streets.

Sub-Alternative A will also require right-of-way acquisition from the Eva by Deady
development.

Demand of the Eva Villages development, both sub-alternatives would pass through a
land parcels designated for use by the Department of Hawaiian Home Lands (DHHL). While
this land is owned by the State of Hawaii, the use of this land for a major
transmission corridor is not consistent with the current DHHL plans for its use. North
of the DHHL parcel, the land is owned by the Estate of James Campbell from whom
this land would need to be acquired.
3. Palihu'a Corridor

The southern half of the Palihu'a Corridor alignment is owned by the State of Hawai'i and the northern half is owned by the Estate of James Campbell. The State of Hawai'i position needs only to be transferred to the State of Hawaii Department of Transportation by Executive Order. The Campbell land needs to be acquired, but the land has already been set aside for infrastructure purposes.

Table 2 summarizes the right-of-way requirements of the corridor alignments. The right-of-way required for the interchange with H-1 Freeway is not included.

<table>
<thead>
<tr>
<th>Corridor Alternative</th>
<th>Right-of-Way Needs - hectares (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Weaver Road Corridor</td>
<td>6.24 (15.4)</td>
</tr>
<tr>
<td>Ewa Villages Corridor, Sub-Alternative A</td>
<td>4.9 (12.1)</td>
</tr>
<tr>
<td>Ewa Villages Corridor, Sub-Alternative B</td>
<td>3.6 (9.3)</td>
</tr>
<tr>
<td>Palihu'a Corridor</td>
<td>3.97 (9.8)</td>
</tr>
</tbody>
</table>

As shown, the Palihu'a Corridor requires the least amount of right-of-way acquisition, followed by the Ewa Villages Corridor, Sub-Alternative B, and the Fort Weaver Road Corridor. The Ewa Villages Corridor, Sub-Alternative A requires, by far, the most right-of-way acquisition.

C. CONSTRUCTION COST

Construction cost does not include the costs of right-of-way acquisition and compensation for displaced residents or businesses.

1. Fort Weaver Road Corridor Alternative

The Fort Weaver Road Corridor is the most expensive in terms of construction cost. To minimize impacts to the cross-streets, Fort Weaver Road was assumed to be grade-separated over them. This resulted in large and expensive interchange structures.

Table 2 Corridor Alignment Alternatives Right-of-Way Impacts

The light diamond interchange configuration was assumed to minimize property impacts at the interchange locations. This required relaxing ramps at the mainline and interchange ramps, again increasing cost. Therefore, much of the cost of this corridor alternative is the cost of the interchanges on Fort Weaver Road. The interchange for the Lualualei Street area will be especially expensive due to its close proximity to the existing Farrington Highway interchange. This close distance will require ramp building with the Farrington Highway interchange ramps, requiring expensive ramp structures.

2. Ewa Villages Corridor Alternative

The Ewa Villages Corridor Alternatives are also expected to have significant construction cost, due to the mitigation measures required through the Ewa Villages Historic District. It is expected that some type of grade separation will be required to convey the future North-South Road under the Ewa Villages Golf Course fairways. Significant noise abatement walls will probably be required within the Tenny and Kekaha Village areas. This corridor, unlike the other two, will cross the future realigned Koko Gulch, requiring a significant drainage structure. Sub-Alternative B has the additional cost of constructing the existing Ewa by Gentry residential units and re-aligning Kapolei Parkway to intersect the new roadway. Sub-Alternative B has the additional cost of constructing a service road for Park Row east of the future North-South Road to provide access to parcels landlocked by the closure of existing cross streets that now access Park Row.

Sub-Alternative B will probably have lower construction costs than Sub-Alternative A due to the need for a shorter grade separation under the Ewa Villages Golf Course fairways and shorter roadway length. Demolition costs are also lower for Sub-Alternative B.

3. Palihu'a Corridor Alternative

The Palihu'a Corridor Alternative is projected to be the least expensive corridor alternative. It will be constructed in relatively flat topography with no major physical constraints. Because the corridor penetrates an area that is currently undeveloped, no
D. Travel Benefits

Projected peak period travel times were used to help quantify travel benefits of the corridor alternatives. Travel times were computed from four origin areas to a point of the H-1 Freeway just west of the Kapolei Interchange. The most logical path was utilized for each travel time estimate.

The four origin areas are:

1. Ewa Beach Area - from the Fort Weaver Road/Papapi Road intersection
2. Ewa Villages Area - from the Kapolei Park/Park Row intersection
3. Kapolei Area - from the Kapolei Park/Kamehame Avenue intersection
4. HFDG Development Area - from the new Ewa West Development Road/Kaloa Gulch intersection

For the purposes of this travel time assessment, the two Ewa Villages sub-alternatives were assumed to behave similarly and were consolidated into one alternative.

Table 3

<table>
<thead>
<tr>
<th>Corridor Alternative</th>
<th>Construction Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Weaver Road Condo</td>
<td>619 million</td>
</tr>
<tr>
<td>Ewa Villages Condo, Sub-Alternative A</td>
<td>310 million</td>
</tr>
<tr>
<td>Ewa Villages Condo, Sub-Alternative B</td>
<td>310 million</td>
</tr>
<tr>
<td>Papahana Condo</td>
<td>39 million</td>
</tr>
</tbody>
</table>

Using measured distances and the posted speed limits, the free flow travel times were computed and then the intersection and interchange delays were added. Table 5 summarizes the travel path lengths and the resulting travel times for the corridor alternatives.

Table 4

<table>
<thead>
<tr>
<th>Area Origin</th>
<th>Corridor/Alternative</th>
<th>YDi</th>
<th>Travel Path Length (meters/miles)</th>
<th>Total Travel Time (mins/hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewa Beach Area</td>
<td>Fort Weaver Road Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Ewa Villages Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papahana Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ewa Villages Area</td>
<td>Fort Weaver Road Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Ewa Villages Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papahana Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kapolei Area</td>
<td>Fort Weaver Road Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Ewa Villages Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papahana Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFDG Development Area</td>
<td>Fort Weaver Road Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
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</tr>
<tr>
<td>Ewa Villages Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papahana Condo</td>
<td>6.600 (2.56)</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Fort Weaver Road Corridor Alternative will have limited usefulness for the Kapolei area, requiring traffic originating in this area to utilize east-west cross-streets for significant distances to access the improved Fort Weaver Road corridor.

2 Eva Vilages Corridor Alternative

The Eva Villages Corridor Sub-Alternatives provide much better travel times than the Fort Weaver Road Corridor Alternative during the AM peak period. It provides similar travel times to the Pali Highway Road Corridor Alternative, differing by only 3 minutes.

3 Pali Highway Corridor Alternative

The Pali Highway Corridor Alternative also provides much better travel times than the Fort Weaver Road Corridor Alternative during the AM peak period. Its travel times are similar to the Eva Villages Corridor Alternative travel times, differing by about 3 minutes.

V. SELECTION OF PREFERRED CORRIDOR ALTERNATIVE

A. Evaluation Summary

The criteria elements examined include:

1 Community Impacts
2 Right-of-Way Impacts
3 Construction Cost
4 Travel Benefits

Community Impacts - The Eva Villages Corridor Alternatives had the largest community impacts. Property impacts, recreational (R) impacts, and historical (Section 106) impacts were greatest for this corridor. The Fort Weaver Road Corridor Alternative community impacts were significant mostly in the area of disruption of existing access to Fort Weaver Road. The Pali Highway Corridor Alternative community impacts are minimal.

Right-of-Way Impacts - The right-of-way impacts for the Eva Villages Corridor Alternatives are the greatest as they will require acquisition of property not currently identified for roadway use. The Fort Weaver Road Corridor Alternative will require additional right-of-way primarily around its proposed interchanges. Much of the Pali Highway Corridor Alternative has been identified for roadway use, and a significant portion of the land is already owned by the State of Hawaii.

Construction Cost - The Fort Weaver Road Corridor Alternative has the highest construction cost due to the cost of the proposed interchanges and the retaining walls required between the mainline and the interchange ramps. The Eva Villages Corridor Alternatives also have high construction costs due to the grade separation needed to convey North-South Road under the Eva Villages Golf Course fairways and the drainage structure needed to cross the realigned Kaho'ohāl slips. The construction costs for the Pali Highway Corridor Alternative are the lowest of all the alternatives.

Travel Benefits - The Fort Weaver Road Corridor Alternative results in the worst travel time performance during the AM peak period due to projected congestion at the Kunia Interchange at the H-1 Freeway if no alternative access to H-1 is provided.
Ewa Vitakas Corridor Alternatives and the Palihau Corridor Alternative provide similar travel time performance.

B. Recommendation

Because it has no community impacts, requires the least amount of right-of-way acquisition, has the lowest construction cost, and provides a travel time advantage, the Palihau Corridor Alternative is a viable proposal and should be further evaluated. The Fort Weaver Road Corridor Alternative and the Ewa Vitakas Corridor Alternative are not recommended for further evaluation.

The Palihau Corridor Alternative will be used as the Build system alternative for further evaluation against the No-Build and Transportation System Management (TSM) system alternatives in the environmental assessment.
APPENDIX C

INTERSTATE ACCESS MODIFICATION REQUEST
DRAFT
INTERSTATE ACCESS MODIFICATION REQUEST

NORTH-SOUTH ROAD STUDY

Ewa, Oahu, Hawaii
May 2004

NORTH-SOUTH ROAD CORRIDOR STUDY
Ewa, Oahu, Hawaii
Project No. HWY-001-92

DRAFT
INTERSTATE ACCESS MODIFICATION REQUEST

Prepared by:
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May 2004

RIDC Reference: 16218A – Product 11.1
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CHAPTER 1
INTRODUCTION AND PURPOSE

A. Introduction

In 1977, the City & County of Honolulu approved a new General Plan that designated the Ewa plan as the location for a secondary urban center for Oahu, focused on the new town of Kapolei. The Secondary Urban Center was to be the focus of major economic activity and housing development, and a center for government services. While the General Plan promoted full development of the Primary Urban Center, it also encouraged development of the Secondary Urban Center at Kapolei, and residential development of the urban fringe areas in Ewa and Central Oahu. Since the concept was first adopted, significant progress has been made in implementing the vision of the Second City in the Ewa plan.

In Ewa, the West Loch Estates and West Loch Farmlands, Ewa by Gentry, and Ewa Villages, and Ocean Pointe residential developments with associated support commercial and educational facilities have all proceeded substantially into their planned buildout programs.

In Makaha and Kapolei, development is also proceeding as planned. The Housing Development Corporation of Hawaii (HDC) has completed a substantial portion of the Villages of Kapolei including the Kapolei Elementary School, Kapolei Middle School, and Kapolei High School. Within the City of Kapolei, the Estate of James Campbell has developed an office building complex, Bank of Hawaii has constructed an office building, and the State of Hawaii and the City and County of Honolulu have constructed new office buildings for their agencies. There is a new medical center, and support commercial uses such as shopping centers, a cinema multiplex, and big box retail development have occurred.

The Ewa Development Plan, adopted by City Council in 1997, confirms the role for the Ewa community outlined in the General Plan. As an extension of the plan, the Ewa Public Facilities Map identifies existing and future infrastructure needs for the Ewa Development Plan Area. Included in the Ewa Public Facilities Map is a new central...
roadway and associated interchange on Interstate H-1 Freeway. This new roadway is
called the North-South Road, and its associated interchange is proposed to be
located between the existing Kualoa and Makanekai interchanges. Figure 1-1 illustrates
the Ewa area and the proposed North-South Road and interchange.

As the Secondary Urban Center is implemented, transportation facilities identified in the
Ewa Public Facilities Map are needed to maintain regional and sub-regional access and
mobility for the Ewa Development Plan area. The North-South Road and
Interchange on Interstate H-1 Freeway will play an integral part in providing regional
access to this important Secondary Urban Center.

B. Purpose

The purpose of this report is to provide the rationale for approval of an additional
access to the Interstate System at its junction with proposed North-South Road in Ewa,
Oahu, Hawaii as outlined in Title 23, Code of Federal Regulations 630. The new
Interchange is proposed to be located between the existing Makanekai and Kualoa
Interchanges at a distance of approximately 2 miles from each

This report will detail the existing and anticipated future conditions in the study area,
and analyze the anticipated impact to the Interstate and local roadway system.

C. Need for North-South Road Interchange

The designation of the Ewa area as the location for a secondary, urban center for Oahu
and the Ewa Development Plan support the General Plan policies by:

- Providing for an employment center outside of Downtown Honolulu to help
direct commuter traffic from Downtown and nearby areas;
- Concentrating employment activities at industrial and resort areas in Ewa, and

government service and higher education centers near the city of Kapolei,
so new markets are created outside Downtown and nearby areas for office
and retail activities;
- Providing for significant residential development throughout Ewa – including a
variety of housing types from affordable units and starter homes to mid-size


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CHAPTER 2
DESCRIPTION OF EXISTING CONDITIONS AND PROPOSED ACTION

A. Project Identification
The proposed North-South Road Interchange will be a new interchange located approximately midway between the existing Makakilo and Kaunia Interchanges on Interstate HI Freeway. The spacing between the existing Makakilo and Kaunia Interchanges is approximately 4 miles and, therefore, the resulting distances between these Interchanges and the proposed North-South Road Interchange are approximately 2 miles. These interchange spacing distances are consistent with guidelines published in the publication entitled, A Policy on Geometric Design of Highways and Streets, 2000 by the American Association of State Highway and Transportation Officials (Green Book) and current guidelines promulgated by the Federal Highway Administration (FHWA). Figure 1-1 in the previous section of this report illustrates the proposed location for the North-South Road Interchange, while Figure 2-1 illustrates the spacing distances between the North-South Road Interchange and the existing adjacent Interchanges on Interstate HI Freeway.

B. Project Evolution
In 1977, the City & County of Honolulu approved a new General Plan that designated the Ewa Plain as the location for a secondary, urban center for Oahu, located on the new town of Kapolei. The Secondary Urban Center was to be the focus of major economic activity and housing development, and a center for government services. While the General Plan promotes full development of the Primary Urban Center, it also encourages development of the Secondary Urban Center at Kapolei, and residential development of the urban fringe areas in Ewa and Central Oahu.

The Ewa Development Plan, adopted by City Council in 1997, reaffirms the role for the Ewa community outlined in the General Plan. The Ewa Public Facilities Map identified existing
and future infrastructure needs for the Ewa Development Plan area. Included in the Public Facilities Map was a new arterial roadway and associated interchange to the H-1 Freeway. This new roadway is referred to as North-South Road, and it is located between the existing Kaaia and Makaleo interchanges.

Even before inclusion into these plans, a roadway and associated interchange parallel to Fort Weaver Road had been discussed. Previous and current versions of the Oahu Regional Transportation Plan and the Ewa Transportation Master Plan have identified the North-South Road and its associated interchange on Interstate H-1 Freeway as a desired component of the transportation system for the Ewa plan.

In 1994, the State of Hawaii Department of Transportation (DOT) initiated the planning stage of the North-South Road and Interchange and retained a consultant team to develop the environmental documentation, obtain the necessary clearance from the FHWA for modification of interstate access, and to update the Ewa Transportation Master Plan.

During environmental documentation, two issues surfaced that required extended consultation: detection of Abution mammary arid endangered plant, and regional drainage within the Kaiolani Slough. The latter required considerable discussion and coordination to produce a Final Conservation Plan (FCP) as required under Chapter 195D, Hawaii Revised Statutes, as amended. The latter issue required considerable discussion with landowners and governmental agencies.

These two issues are now approaching closure and a revised Environmental Assessment is now being prepared. Other potential environmental impacts will be addressed in the EA for the North-South Road project desires to initiate the implementation of both the North-South Road and Interchange, and consequently is seeking approval to access the H-1 Freeway.

May 2001
C. Existing Conditions and Proposed Project Modifications

1. Transportation Conditions, Deficiencies, and Engineering Considerations

a. Functional Classification and National Highway System (NHS)

The H-1 Freeway is on the National Highway System and is approximately 72 miles inland.
The proposed North-South Road will be a principal arterial highway, under the jurisdiction
of HDOT and will extend from the Kapolei Parkway to the H-1 Freeway a distance
approximately 9.2 miles.

b. Climate, Terrain, and Geologic Conditions

The land that will be traversed by the proposed North-South Road was formerly used to
cultivate sugar cane. In 1977, the City and County of Honolulu designated the Ewa plain
as the Secondary Urban Center, and the area has been transitioning from agricultural to
urban uses.

The terrain is generally flat, with the land sloping gradually from Interstate H-1 Freeway, which
runs in the east-west direction, to the south shoreline.

The climate in the Ewa plain is usually and, with infrequent winter thunderstorms that create
major drainage events.

c. Control of Access

In Kapolei/Ewa area, the H-1 Freeway has limited control of access with interchanges located
at Kamehameha Highway, Kamehameha Highway (Hwy) and Kamehameha Highway /Kapolei
Pike

The proposed North-South Road will be a limited access arterial roadway with at-grade
intersection access regulated by the HDOT.
The proposed North-South Road will ultimately be a six-lane, principal arterial roadway between Kapolei Parkway and Interstate H-1 Freeway. North of Interstate H-1 Freeway, there will be a connection from the Makakilo area to the North-South Road interchange. This roadway is expected to be a collector roadway.

1. Existing Public Transit Routes

Figure 2-3 illustrates the existing public transit routes within the Ewa region. A full range of transit service is provided for the Ewa area. Express buses provide peak hour commuter service to both Downtown Honolulu and Waikele. There is also hop-on and regular transit service along the major arterials with circulator bus service providing access to the neighborhoods.

2. Speeds and Delay

The posted speed limit of the H-1 Freeway is 50 miles per hour (mph) between Kapolei and Makakilo Interchanges. East of Kapolei Interchange and west of Makakilo Interchange, the posted speed limit is 55 mph.

Vehicles traveling on Interstate H-1 Freeway within the study area are usually unconstrained in terms of speed, even during peak periods. There is slight slowing associated with the on-ramps, but these usually do not cause major disruption to the freeway traffic.

The arterial roadways that serve to access the Interstate H-1 Freeway do experience delay during peak periods. The Farrington Highway/Makakilo Drive/Foil Weave Road intersection is a bottleneck for vehicles accessing the Kapolei/Makakilo area at the existing Makakilo Interchange. The intersection has already been significantly improved with double-turn lanes provided where appropriate. The Foil Weaver Road corridor provides access to Interstate H-1 Freeway for the Ewa and Ewa Beach areas. Currently, vehicles experience almost zero minutes of delay during the AM peak period attempting to access Interstate H-1 Freeway.
h. Existing Traffic Volumes

Figure 2-1 summarizes the existing peak hour traffic volumes within the study area.

Significant peak hour traffic volumes are observed during the AM peak hour on the H-1 Freeway bound off ramps of the Kapolei Interchange. The total AM peak hour volume on the Kamehameha Highway on ramps is 3,034 vehicles per hour (vph), while the Molokai on ramps total 1,772 vph. These volumes approach the capacity of lane pickup and merge ramps, respectively. The PM peak hour Waianae bound volumes are also significant with a total of 2,853 vph exiting at Kvaney Interchange and 1,498 vph exiting at Kapolei Interchange.

i. Level of Service

Improvements to the Kvaney Interchange were completed recently increasing capacity and efficiency to process traffic at on and off ramps. The Waianae bound to H-1 Freeway off ramp was widened from a single lane to a two lane loop ramp, and the ramp terminal intersection at the Waianae bound to H-1 Freeway off ramp was modified to allow free flow right-turn movement. Both actions reduced queuing on the off ramps, thereby reducing congestion on H-1 Freeway. The H-1 Freeway bound lanes were re-configured to create a lane drop at the Kvaney Interchange off ramp and to create a two lane pickup at the Waianae bound Kvaney Interchange on ramp increasing the ramp capacity to handle traffic joining H-1 Freeway at this interchange. During the morning peak period, traffic originating at Kvaney Interchange is allowed to utilize the shoulder lane on Interstate H-1 in the Kvaney bound direction until the Panola Interchange located approximately two miles downstream from the Kvaney Interchange. This provides an additional lane pickup, further increasing interchange capacity.

At the Kapolei Interchange, the Waianae bound off ramp was widened from a single to a double lane off ramp with channelization and signalization at Makakilo Drive. Traffic originating from Makakilo and headed in the Kaveney bound direction, via the H-1 Freeway has been provided with an exclusive lane to bypass the signal at Makakilo.
2. Freeway Operations

Table 2-1 and Figure 2.5 summarize the existing freeway operations from Poki'o Interchange to Pali Interchange.

Table 2-1

<table>
<thead>
<tr>
<th>Freeway Segment</th>
<th>Lane Usage</th>
<th>Direction</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poki'o IC - Kualo IC</td>
<td>4 (1)</td>
<td>WB</td>
<td>B</td>
<td>D</td>
</tr>
<tr>
<td>Kualo IC - Makakilo IC</td>
<td>4 (1)</td>
<td>VB</td>
<td>B</td>
<td>D</td>
</tr>
<tr>
<td>Makalapa IC - Pali IC</td>
<td>3 (0)</td>
<td>VB</td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>Pali IC - Makalapa IC</td>
<td>3 (0)</td>
<td>KBHD</td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>Makalapa IC - Kualo IC</td>
<td>4 (0)</td>
<td>KBHD</td>
<td>B</td>
<td>D</td>
</tr>
<tr>
<td>Kualo IC - Poki'o IC</td>
<td>6 (0)</td>
<td>KBHD</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

In Table 2-1, the AM peak flow is for the time period from 6:00 AM to 9:00 AM. The PM peak flow is for the time period from 4:00 PM to 7:00 PM.

As shown in Table 2-1 and Figure 2.5, these recent improvements result in good in-service operations on H-1 Freeway in both directions during the AM and PM peak periods. As Koko Head bounds traffic approaches the Pali Street interchange, AM peak period operation declines to LOS C, due primarily to downstream congestion at the H-1-M2 merge. The remaining segments all operate at a LOS of C or better.

3. Freeway Merge/Diverge Operations

The existing ramp conditions at the Kualo, Makalapa, and Pali Interchanges are summarized in Table 2-2.
The results shown in Table 2-2 indicate that all of the ramps at the Kapolei, Kaukapalapala, and Fort Weaver Interchanges operate very well. The worst case being the on ramp at Fort Weaver Road/Kaumualii Road interchange headed northbound, which operates at LOS E during the AM peak period due to congestion in the segment of Kaumualii Road located between Farrington Highway and HI-1 Freeway. The remaining ramps all operate at LOS B or better.

### Table 2-2

<table>
<thead>
<tr>
<th>Interchange Ramp</th>
<th>AM Density</th>
<th>PM Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kapolei Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SB Ramps Off Ramp Diverge</td>
<td>A 4.4 B 13.5</td>
<td></td>
</tr>
<tr>
<td>SB Exit Off Ramp Diverge</td>
<td>B 14.6 C 25.0</td>
<td></td>
</tr>
<tr>
<td>SB Kaukapalapala On Ramp Merge</td>
<td>B 15.5 B 17.8</td>
<td></td>
</tr>
<tr>
<td>NS/Kaumualii Off Ramp Lane Drop</td>
<td>C 11.4 B 10.4</td>
<td></td>
</tr>
<tr>
<td>NS/Kaumualii On Ramp Lane Add</td>
<td>B 20.4 C 24.0</td>
<td></td>
</tr>
<tr>
<td>Makaha Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NW/ID Makaha On Ramp Merge</td>
<td>B 17.0 B 13.4</td>
<td></td>
</tr>
<tr>
<td>NW/ID Kapolei On Ramp Merge</td>
<td>C 21.5 B 15.9</td>
<td></td>
</tr>
<tr>
<td>SB Off Ramp Diverge</td>
<td>A 9.2 B 10.6</td>
<td></td>
</tr>
<tr>
<td>Fort Weaver Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SB Off Ramp Diverge</td>
<td>C 29.1 B 15.7</td>
<td></td>
</tr>
<tr>
<td>SB On Ramp Lane Add</td>
<td>E 39.5 C 26.3</td>
<td></td>
</tr>
<tr>
<td>SB Off Ramp Diverge to VB</td>
<td>A 13.7 A 5.6</td>
<td></td>
</tr>
<tr>
<td>SB On Ramp Merge</td>
<td>B 13.7 C 15.5</td>
<td></td>
</tr>
<tr>
<td>SB Kapolei/Keaamani</td>
<td>E 30.5 G 27.1</td>
<td></td>
</tr>
</tbody>
</table>

*LOS B (Critical): 1,000 vehicles per mile per hour, LOS A: < 750 veh/mi/hour, LOS E: < 200 veh/mi/hour, LOS G: < 100 veh/mi/hour*

**Table 2-3**

Table 2-3 summarizes the results of the interchange terminal analysis.

May 2004
### Table 2-2

<table>
<thead>
<tr>
<th>Existing Interchange Terminal Level-of-Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interchange Terminal</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Kaka'o Interchange</td>
</tr>
<tr>
<td>Kolea Road</td>
</tr>
<tr>
<td>Kolea Road (Sum)</td>
</tr>
<tr>
<td>Makaha Bound</td>
</tr>
<tr>
<td>Makaha Bound (Sum)</td>
</tr>
<tr>
<td>Fort Weaver Interchange</td>
</tr>
<tr>
<td>Kolea Road</td>
</tr>
<tr>
<td>Kolea Road (Sum)</td>
</tr>
<tr>
<td>Makaha Bound</td>
</tr>
<tr>
<td>Makaha Bound (Sum)</td>
</tr>
</tbody>
</table>

The results of these analyses show that the majority of the movements at the existing interchange ramp terminals are operating well during the peak period, at a LOS of C or better. However, there are two left-turn movements at the Kolea interchange that are constrained during the peak hours. The left-turn movement from the Kolea Road bound all.

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The text continues with further analysis and recommendations.
CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING
### Table 2-3

<table>
<thead>
<tr>
<th>Interchange Terminals</th>
<th>AM LOS Denency</th>
<th>PM LOS Denency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kailua Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-1 KOLO On Ramp/Kailua Road</td>
<td>53.2</td>
<td>27.7</td>
</tr>
<tr>
<td>Kolea Head-bound Left Turn</td>
<td>67.2</td>
<td>62.6</td>
</tr>
<tr>
<td>Makaha-bound Through</td>
<td>47.4</td>
<td>40.1</td>
</tr>
<tr>
<td>Makaha-bound LOS Turn</td>
<td>50.4</td>
<td>44.9</td>
</tr>
<tr>
<td>Makaha-bound Through</td>
<td>5.8</td>
<td>18.4</td>
</tr>
<tr>
<td>H-1 Wai On Ramp/Kailua Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makaha-bound Left Turn</td>
<td>73.9</td>
<td>63.0</td>
</tr>
<tr>
<td>Makaha 697 Interchange</td>
<td>63.0</td>
<td>63.0</td>
</tr>
<tr>
<td>H-1 Wai 697 range/Kailua Road</td>
<td>27.3</td>
<td>13.6</td>
</tr>
<tr>
<td>Waianae-bound Approach</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>28.7</td>
<td>23.1</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>54.4</td>
<td>21.0</td>
</tr>
<tr>
<td>Fort Weaver Interchange</td>
<td>63.0</td>
<td>63.0</td>
</tr>
<tr>
<td>Fort Weaver 697 On Ramp</td>
<td>15.1</td>
<td>15.3</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>27.2</td>
<td>13.0</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>5.5</td>
<td>13.0</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>27.2</td>
<td>13.0</td>
</tr>
<tr>
<td>Waianae-bound Through</td>
<td>5.5</td>
<td>13.0</td>
</tr>
</tbody>
</table>

The results of these analyses show that the many of the movements at the existing interchange ramp terminals are operating well during the peak periods, at a LOS of C or better. However, there are two left turn movements at the Kailua Interchange that are constrained during the peak hours. The left turn movement from the Waianae-bound off-

---

ramp is at LOS E during both the AM and PM peak periods, and the right-bound left turn to the Waianae-bound on-ramp operates at LOS E during the AM peak period. This is due to the heavy volume of vehicles being processed at this terminal. Additionally, makaha-bound traffic on Kolea Road turning right onto the Waianae-headbound off-ramp is very congested during the AM peak period, causing the delay for traffic generated in the Ewa plan to access the Interstate H1 Freeway.

### 5.2 Adjacent Intersection Operations

A review of adjacent intersections at the Makaha and Kailua Interchange shows that the Fort Weaver Road corridor is constrained during the AM peak period. Table 2-4 summarizes the intersection LOS for the Fort Barnes Road/Farrington Highway intersection and the intersections along the Fort Weaver Road corridor. As shown, key movements at the Fort Barnes Road/Farrington Highway intersection operate at LOS E. During the AM peak period, while the Kolea-headbound approach to this intersection is often at LOS F during the PM peak period.

The Fort Weaver Road corridor is congested during the AM peak period. Makaha-bound traffic flow is constrained, while side street queue length and delay is very long. Travel time jumps in the corridor have been delayed approaching 14 minutes for makaha-bound traffic. Future plans call for Fort Weaver Road to be widened to six lanes in the future, but that improvement alone is not expected to alleviate the congestion in this corridor. An alternative path for regional highway access is needed to address this issue.
### CHAPTER 3

**PROJECTED CONDITIONS AND NEED FOR THE PROPOSED ACTION**

A. **Planned Development in Influence Area**

The area served by the proposed North South Road Interchange is designated a major growth area by the City & County of Honolulu General Plan and by the Ewa Community Development Plan. Figure 3.1 summarizes the projected increases in population, employment, and housing units in the Ewa plan as input into the regional travel demand model as part of the *Only Regional Transportation Plan*. This planned growth includes a second 4-year campus for the University of Hawaii and major increases in residential development. The potential redevlopment of the former Daniel K. Inouye Air Station, now known as Kalakaua, is not included in these forecasts, resulting in a conservative projection.

B. **Safety Considerations**

Any new access point on a freeway could increase accident potential. However, due to best practice design for the proposed interchange, any change in accident potential is not projected to be significant.

C. **Non-Standard Features and Non-Conforming Features**

All proposed design elements will conform to *AASHTO* and State of Hawaii Department of Transportation standards.

D. **System Elements and Conditions**

The proposed North South Road Interchange is a integral part of the system plan for access to H-3 Freeway. The proposed interchange is included in the *Only Regional*. 

---

**Table 2-4**

**Existing Adjacent Intersection Level-of-Service**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>AM LOS</th>
<th>AM Delay</th>
<th>PM LOS</th>
<th>PM Delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farrington Hwy/Makaiki Dr</td>
<td>E</td>
<td>40.2</td>
<td>D</td>
<td>47.5</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>35.6</td>
<td>G</td>
<td>30.7</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>E</td>
<td>41.6</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Maka-bound</td>
<td>E</td>
<td>31.7</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Maha-bound</td>
<td>E</td>
<td>61.1</td>
<td>D</td>
</tr>
<tr>
<td>Ft Weaver Rd/Eleventh St</td>
<td>D</td>
<td>49.4</td>
<td>D</td>
<td>51.4</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>F</td>
<td>59.7</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Maka-bound</td>
<td>E</td>
<td>58.7</td>
<td>G</td>
</tr>
<tr>
<td></td>
<td>Maha-bound</td>
<td>B</td>
<td>13.3</td>
<td>D</td>
</tr>
<tr>
<td>Ft Weaver Rd/Blaisdell Dr</td>
<td>E</td>
<td>56.3</td>
<td>D</td>
<td>36.8</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>F</td>
<td>85.1</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Maka-bound</td>
<td>E</td>
<td>59.9</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Maha-bound</td>
<td>B</td>
<td>17.1</td>
<td>D</td>
</tr>
<tr>
<td>Ft Weaver Rd/Redfinson Rd</td>
<td>F</td>
<td>80.2</td>
<td>E</td>
<td>59.4</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>F</td>
<td>72.9</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Maka-bound</td>
<td>E</td>
<td>107.7</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Maha-bound</td>
<td>E</td>
<td>31.8</td>
<td>E</td>
</tr>
<tr>
<td>Ft Weaver Rd/Kahului Hwy</td>
<td>E</td>
<td>18.9</td>
<td>D</td>
<td>39.2</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>F</td>
<td>59.9</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Maka-bound</td>
<td>D</td>
<td>36.7</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Maha-bound</td>
<td>D</td>
<td>37.4</td>
<td>G</td>
</tr>
<tr>
<td>Ft Weaver Rd/Oliver Rd</td>
<td>F</td>
<td>54.4</td>
<td>E</td>
<td>66.7</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>F</td>
<td>127.2</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Maka-bound</td>
<td>E</td>
<td>51.4</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Maha-bound</td>
<td>D</td>
<td>39.2</td>
<td>D</td>
</tr>
</tbody>
</table>
Transportation Plan and the Ewa Transportation Master Plan. The proposed interchange is located two miles from each of the adjacent interchanges on H-1 Freeway, which is an accepted interchange spacing on an interstate freeway. The interchange is part of a sub-regional system of arterials that will provide access and mobility to theEwa Plain - North-South Road, will be a major arterial that is an integral part of the arterial plan.

E. Projected Roadway Networks

Figures 3.2 and 3.3 illustrate the projected roadway configurations for the year 2025 time frame, without and with the proposed North-South Road Interchange.

F. Projected Transit Routes

Figure 3.4 illustrates the projected bus routes for the study area. The primary difference from existing transit systems is the assumed implementation of a high capacity regional transit system that would serve the H-1 corridor.

G. Projected Year 2025 Traffic Volumes

Figures 3.5 and 3.6 illustrate the projected year 2025 AM and PM peak hour traffic volumes without and with the proposed North-South Road Interchange. The projected volumes are based on traffic volumes estimated by the Oahu Metropolitan Planning Organization's (OMPO) regional travel demand model and refined using the travel demand model associated with the Ewa Transportation Master Plan.

H. Projected Traffic Operations

Figures 3.7 and 3.8 summarize the year 2025 projected peak hour traffic operations without and with the proposed North-South Road Interchange, respectively.

1. Freeway Operations

Table 3.1 summarizes the results of the freeway segment analysis.
PROJECTED YEAR 2025 ROADWAY CONFIGURATION WITH NORTH-SOUTH ROAD INTERCHANGE

Figure 3-3

PROJECTED YEAR 2025 ROADWAY CONFIGURATION WITHOUT NORTH-SOUTH ROAD INTERCHANGE

Figure 3-2
Table 3-1
Year 2025 Freeway Segment Level-of-Service

<table>
<thead>
<tr>
<th>Freeway Segment</th>
<th>Lanes (Excluding AM Peak)</th>
<th>Operation</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOS Density</td>
<td>LOS Density</td>
</tr>
<tr>
<td>Kulanik I- Alakalai I</td>
<td>1 (1)</td>
<td>EB</td>
<td>C 28.1</td>
<td>C 28.1</td>
</tr>
<tr>
<td>Kulanik I - North-South Rd I</td>
<td>1 (1)</td>
<td>EB</td>
<td>C 28.1</td>
<td>C 28.1</td>
</tr>
<tr>
<td>North-South Rd I - Makaha I</td>
<td>2 (2)</td>
<td>EB</td>
<td>C 19.1</td>
<td>C 19.6</td>
</tr>
<tr>
<td>Makaha I - Puna I</td>
<td>2 (2)</td>
<td>EB</td>
<td>D 28.1</td>
<td>D 28.1</td>
</tr>
<tr>
<td>North-South Rd I - Makaha I</td>
<td>2 (2)</td>
<td>EB</td>
<td>C 28.1</td>
<td>C 28.6</td>
</tr>
<tr>
<td>North-South Rd I - Kulanik I</td>
<td>2 (2)</td>
<td>EB</td>
<td>D 28.3</td>
<td>D 31.6</td>
</tr>
<tr>
<td>Puna I - Kulanik I</td>
<td>2 (2)</td>
<td>EB</td>
<td>D 27.8</td>
<td>D 27.6</td>
</tr>
</tbody>
</table>

Copies of the analysis worksheets are included in a separate Technical Appendix.

As shown in Table 3-1, the Freeway is projected to operate acceptably for peak hour conditions with and without North-South Road Interchange at LOS C or better at every segment except for the outbound segments during the AM peak period which operate at LOS D. This can be explained by the typical heavy morning traffic heading east for either work or school.

With the addition of North-South Road Interchange, the freeway density is slightly higher on the segment between North-South Road Interchange and Kulanik Interchange, in both directions, than the density on that same segment in the no build scenario. More vehicles are on this segment because they are using the North-South Road Interchange over the Kulanik Interchange to get to their destination. However, the level of service is the same for that segment in both build and no build scenarios.
2 Freeway Merge-Divergent Operations

Table 3.2 summarizes the results of the Freeway Merge-Divergent analyses. The results of
the ramp analysis show that there are several problem areas in the no build scenario, with
certain ramps operating at LOS E and F. The eastbound on ramp at Kaka'a Interchange off
of H-1 Freeway operates at LOS F during both the AM and PM peak periods and the weave
between Kaka'a Interchange and Farrington Highway operates at LOS F during the AM
peak period. Both of these conditions are caused by increased traffic coming out of the
Ewa and East Kapolei areas.

At Fort Weaver Interchange, the southbound off ramp to Farrington Highway operates at
LOS E during the AM peak period, as this ramp will pick up the majority of the UN West
Cahu traffic. The northbound off ramp to Farrington Highway will also operate at LOS E
due to growth in the Ewa and Ewa Beach areas.

The remaining ramps at the Kaka'a, Makaha, and Fort Weaver Interchanges will operate
reasonably well in the no build scenario during both the AM and PM peak periods.
Operations at these ramps are at low LOS D or better.

When North-South Road Interchange is included in the analysis, overall ramp operations at
every interchange improve as vehicles now have another way to access H-1 Freeway. At
Fort Weaver Interchange, the two off ramps operating at LOS E in the no build scenario,
will both operate in the build scenario. The southbound off ramp to Farrington
Highway will operate at LOS A in the build scenario because North-South Road will provide
easier access to those heading to the UN West Cahu Campus. The northbound off ramp to
Farrington Highway will operate at an acceptable LOS C.

The LOS F conditions at Kaka'a Interchange in the no build scenario improve in the build
scenario, but drivers will still experience a lot of congestion in these areas. The eastbound
on ramp off of H-1 Freeway will operate at LOS E during both the AM and PM peak periods,
and operations at the weave on Kaka'a Road between H-1 Freeway and Farrington
Highway.

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<table>
<thead>
<tr>
<th>Interchange Ramp</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>with HS RD</td>
<td>with HS RD</td>
</tr>
<tr>
<td>Kaka'a Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EB Off Ramp Merge</td>
<td>C 29.2  B 19.0</td>
<td>C 29.2  B 19.0</td>
</tr>
<tr>
<td>EB On Ramp Merge</td>
<td>C 29.2  B 19.0</td>
<td>C 29.2  B 19.0</td>
</tr>
<tr>
<td>EB On Ramp Lane Add</td>
<td>F 37.6  B 29.4</td>
<td>F 37.6  B 29.4</td>
</tr>
<tr>
<td>EB Off Ramp Merge</td>
<td>C 29.2  B 19.0</td>
<td>C 29.2  B 19.0</td>
</tr>
<tr>
<td>EB On Ramp Merge</td>
<td>C 29.2  B 19.0</td>
<td>C 29.2  B 19.0</td>
</tr>
<tr>
<td>EB On Ramp Lane Add</td>
<td>F 37.6  B 29.4</td>
<td>F 37.6  B 29.4</td>
</tr>
<tr>
<td>EB Off Ramp Merge</td>
<td>C 29.2  B 19.0</td>
<td>C 29.2  B 19.0</td>
</tr>
<tr>
<td>EB On Ramp Merge</td>
<td>C 29.2  B 19.0</td>
<td>C 29.2  B 19.0</td>
</tr>
</tbody>
</table>
will improve to a lower LOS F. The addition of the North-South Road did relieve some of the congestion on Fort Weaver Road, but as explained earlier in this report, Fort Weaver Road is already operating over capacity. The fact that the Ewa and Ewa Beach areas are still growing is developing only adds to the problem.

Copies of the analysis worksheets are included in a separate Technical Appendix.

### Table 3-3

**Interchange Terminal Operations**

Table 3-3 summarizes the results of the Interchange Terminal analysis.

<table>
<thead>
<tr>
<th>Year 2025 Interchange Terminal Level-of-Service</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With HS Bid</td>
<td>With HS Bid</td>
</tr>
<tr>
<td></td>
<td>59 sec cycle</td>
<td>60 sec cycle</td>
</tr>
<tr>
<td>Kaua Interchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haka Terminal</td>
<td>F</td>
<td>70.0</td>
</tr>
<tr>
<td>Vana-bound Approach</td>
<td>F</td>
<td>29.2</td>
</tr>
<tr>
<td>Haka-bound Approach</td>
<td>K</td>
<td>6.0</td>
</tr>
<tr>
<td>Kaka-bound Approach</td>
<td>K</td>
<td>185.5</td>
</tr>
<tr>
<td>Kaka Terminal</td>
<td>C</td>
<td>23.3</td>
</tr>
<tr>
<td>Haka-bound Approach</td>
<td>K</td>
<td>182.3</td>
</tr>
<tr>
<td>Kaka-bound Approach</td>
<td>B</td>
<td>16.3</td>
</tr>
<tr>
<td>Kaka-bound Approach</td>
<td>B</td>
<td>24.2</td>
</tr>
</tbody>
</table>

Copies of the analysis worksheets are included in a separate Technical Appendix.

As shown in Table 3-3, the interchange terminals at the interchange sites experienced problems under the on road scenario. The H-1 Westbound CR Ramp Alma Day terminal operates under a LOS C during the AM peak period and the H-1 Eastbound CR Ramp Alma Day terminal operates at LOS D during the PM peak period. These problems cannot be fixed by the improvement of the demand caused by all of the development at this area.

The interchange terminals at Kaua Interchange and Fort Weaver Interchange will improve accordingly, and in Year 2025, a study of North-South Road interchange will be included at Fort Weaver Interchange.
Union Interchange will operate at an acceptable LOS C or better, while the terminals at Kamehameha III Interchange will experience longer delays but still operate at LOS D or better.

The addition of North-South Road Interchange will improve traffic conditions at all of the interchange terminals. Most importantly, it will alleviate the traffic volume at the Makahiki Interchange terminals, which will all operate at LOS B or better under the build scenario.

4. Adverse Intersection Operating

Table 3-4 summarizes the results of the intersection analysis.

Copies of the analysis worksheets are included in Appendix C of this report.

As shown in Table 2-7, traffic operations at the intersection of Farrington Highway/Makahiki Drive – Fort Barret Road in the scenario without North-South Road will experience heavy congestion and long delays on several approaches during both the AM and PM peak periods. The intersection experiences oversaturated conditions due to the large increase in traffic demand caused by the planned development of the City of Kapolei, the Villages of Nanakuli, and the University of Hawai’i-West Oahu Campus.

Given the high level of improvements already implemented at this intersection, further geometric changes and signal timing are unlikely to be effective. During the AM peak period, the main-line through movement and the multifile left-turn movement on Fort Barret Road are the primary movements that are oversaturated. During the PM peak period, the same two movements plus the Warren-bound right-turn movement on Farrington Highway are constrained.

The North-South Road Interchange provides another regional access into the Ewa Plain thereby sharing and lessening the demand placed on Makahiki Drive/Fort Barret Road intersection. With the North-South Road Interchange, the Farrington Highway/Makahiki Drive – Fort Barret Road intersection will operate at an improved LOS C during both the AM and PM peak periods.

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The Erdington Highway/North-South Road intersection is projected to operate at LOS C during the AM peak period and at a marginal LOS D during the PM peak period. These levels of service are considered acceptable for urban, peak hour operations.

The intersections along the Fort Weaver Road corridor are projected to operate at a much improved level of service due to the additional regional access to the H-1 Freeway.

1. Corridor Level Needs

Corridor level needs are related to the project level needs. The primary issue is the mobility and access for the major growth area in the Ewa Plain.

J. Transportation Plans

The proposed North-South Road interchange is included in the Oahu Regional Transportation Plan and the Ewa Transportation Master Plan. The latter plan is the basis for a traffic impact fee ordinance (Kapolei Revised Ordinances, Chapter 33A) that requires developers within the Ewa plain to pay a predetermined impact fee per constructed unit. The impact fee is levied for six specific roadway projects in the Ewa area.

1. North South Road and North-South Road Interchange,
2. Fort Weaver Road Widening,
3. Fort Barrette Road Widening,
4. Kapolei Parkway Completion,
5. Kapolei Interchange Ramp Modifications,
6. Makakilo Interchange Ramp Modifications

The impact fee is designed to help the State of Hawaii and the City and County of Honolulu provide the necessary matching funds for federal aid improvements on these facilities.

The findings of both the Oahu Regional Transportation Plan and the Ewa Transportation Master Plan are consistent with the findings of this report which identifies North South Road Interchange as a key component for regional mobility and access in the Ewa Plain.

K. Conclusion

The analysis of future Year 2005 traffic conditions shows that the proposed interchange will be effective in maintaining regional access and mobility for the Ewa plain. This interchange is a priority-directed growth area for the Island of Oahu. The Oahu Regional Transportation Plan and the Ewa Transportation Master Plan also include the North-South Road interchange as a future project.

The analysis also finds that the satisfactory operation of the H-1 Freeway will be maintained by the proposed North-South Road and interchange, along with improvements as proposed in the Oahu Regional Transportation Plan.

Based on these findings, it is concluded that the proposed North-South Road interchange will maintain traffic flow and benefit the Ewa Community, and consequently, this facility should be implemented.
CHAPTER 4 INTERCHANGE ALTERNATIVES

The alternatives included in Chapter 3 of this report assumed a diamond interchange configuration for the without versus for the interchange evaluation. That evaluation determined that a new North-South Road interchange located between the existing Makaha and Kuna Interchanges would be needed and can be implemented in a manner that preserves the level of operations of the H-1 Freeway.

This chapter reviews alternative configurations for the proposed North-South Road interchange to determine the appropriate interchange configuration.

A. Design Criteria

1. Standards

   All design elements will be based on the AASHTO A Policy on Geometric Design of Highways and Streets, 2001 and the State of Hawaii statewide uniform design manual for streets and highways, October 1990.

2. Critical Design Elements

   The primary projected traffic movements at this interchange would be between areas Koko Head of the interchange and area mauka of the interchange. Therefore, the Waianae bound off-ramp is configured as a two-lane off ramp and the Koko Head bound on-ramp is configured as a two-lane ramp with one of the ramps being a bus pickup. Because there is the potential that the Waianae-bound to mauka-bound traffic movement at the proposed interchange could be larger than projected, it is recommended to acquire right-of-way to allow the construction of a loop ramp to accommodate this movement if needed.

   The interchange will have enough width on H-1 Freeway to accommodate the future high-occupancy vehicle (HOV) lanes to be constructed by others. The City & County of Honolulu has proposed a park and ride lot at the Koko Head/Bayshore area of the North-South Road/Bayshore Highway interchange. The interchange configuration proposed will work well with the proposed park and ride lot, providing transit vehicles with direct access to the H-1 Freeway via the North-South Road Interchange.

3. Other Controlling Parameters

   a. Interchange Spacing

      The proposed North-South Road interchange is located approximately two miles from the existing Makaha interchange and ten miles from the existing Kuna interchange. Given that the H-1 Freeway corridor in this area is suffering from congestion, this spacing is well within the guidelines for urban interchange spacing of about one mile as documented in AASHTO.

   b. Connection

      The proposed interchange will connect to the North-South Road arterial roadway. This roadway will be owned and maintained by the State of Hawaii Department of Transportation.

   c. Traffic Movement Configuration

      All possible traffic movements will be provided for at the proposed North-South Road Interchange.

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B. Alternatives Considered

1. Definition Screening of Interchange Configurations

a. Types of Freeway Interchanges

The AASHTO A Policy on Geometric Design of Highways and Streets, 2001 (Green Book) identifies several types of interchanges. Figure 4.1 illustrates selected examples of interchange configurations.

These interchange configurations are often grouped into two major categories: 1) freeway-to-freeway and 2) freeway-to-arterial. The all-directional four-leg, three-leg directional, trumpet, and cloverleaf are usually considered freeway-to-freeway interchanges. They are similar in that all interchange connections are provided via merge and diverge movements. No at-grade intersections are involved.

Freeway-to-arterial interchanges often involve configurations that allow at-grade intersections, where interchange ramp terminals intersect the arterial roadway. Examples are the diamond and partial cloverleaf configurations. When appropriate, a flyover ramp is sometimes used to supplement a freeway-to-arterial configuration to accommodate a major traffic movement.

b. Basic Interchange Parameters at North-South Road

At the proposed interchange location, several basic parameters are identified:

- the interchange involves an arterial roadway (North-South Road) and a freeway (H-1);
- the interchange will have four legs;
- all traffic movements will be accommodated;
- the proposed interchange will be located in a gap between two ridges;
- H-1 Freeway, in the vicinity of the proposed interchange, is higher than the level to the south;
- there is significant topography to the north of the proposed interchange location.
there is a future major physical constraint in the southeast quadrant (Kalo Gulch detention pond).
North South Road is a proposed principal arterial roadway.

As such, a freeway-to-arterial type interchange configuration is most appropriate. As shown in Figure 3-1, the diamond, partial cloverleaf, and single-point urban are examples of this type of interchange.

The proposed interchange will serve four roadway legs and therefore, the three legged configurations were eliminated from consideration. The east and west legs of the interchange are composed of H-1 Freeway. The south leg will be North South Road and it will serve the Ewa plan area. The north leg will provide access to the Makai subdivision area, providing an alternative access for this residential area.

All traffic movements are proposed to be accommodated at the interchange and, therefore, all interchange configurations will allow for complete movements at the proposed interchange.

The proposed North-South Road interchange will be located in a gully between two ridges. In the vicinity of this location, H-1 Freeway is approximately 15 to 20 feet higher than the road to the south. In fact, there is an existing causeway road that passes under H-1 Freeway near the proposed alignment of North South Road. These factors strongly suggest that the interchange configuration be configured with North-South Road passing underneath H-1 Freeway.

There is significant topography to the north of H-1 Freeway in the vicinity of the proposed interchange. The topography to the north of H-1 Freeway to the vicinity of the proposed interchange climbs into hills, making it desirable to keep the interchange ramps close to H-1 Freeway to minimize earthwork associated with them. Therefore, current and projected traffic patterns indicate that a loop ramp may be desirable in the northwest quadrant of the interchange. The trade-off between the size of roadway impacts and the operational efficiency of the
5. diamond with flyover ramp for westbound to southbound movement.

Figures 4-2 and 4-3 illustrate these configurations. These interchanges are examined further based on traffic operations, right-of-way requirements, environmental impacts, and cost.

C. Traffic Operations Analyses of Alternatives

One of the parameters used to identify the appropriate interchange configuration is its ability to achieve acceptable traffic operations, based on the projected traffic demand. Analyses that evaluate intersection operations at ramp terminal intersections and merge/diverge operations at freeway ramp junctions are used to determine the performance of the interchange configuration alternatives.

1. Methodology and Assumptions

Future Year 2025 traffic volume forecasts developed as part of this study are used in these analyses. The future volume forecasts are based on the Qatar National Transportation Plan (QNTP) and land use consistent with the Gas Development Plan. Both future A.M. and P.M. peak hour time periods are evaluated.

Figures 4-4, 4-5, 4-6, 4-7, and 4-8 summarize the projected Year 2025 A.M. and P.M. peak hour turning movements for each interchange alternative.

The methodologies in the 2000 Highway Capacity Manual for ramp junctions, signalized intersections, and weaving sections were used to analyze the interchange configurations.

The assumed parameters used in the analysis are as follows:

- Peak hour factor - 0.95
- Truck percentage - 2%
- Lateral clearance - 6.6 feet
- Lane width - 12 feet
- Grade - 0.7% on H-1, 0.4% approach to north on North-South Road, south of interchange

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The turning lane storage lengths were determined using the Cumulative Poisson
Distribution methodology. The intersection cycle length was assumed as shown in Table
4.1.

2. Analysis Results
a. Ramp Juncions

The operational performance of ramp junctons on I-11 Freeway are projected to function
terribly between the two alternatives. The assumption is that all ramps to and from I-11
Freeway will be single point entrances and exits. For example, in one of the partial
cloverleaf configurations, there are two ramps from westbound I-11 Freeway. One will be
loop ramp to the south and the other a ramp to the north. Traffic on both ramps will exit I-
1 Freeway at a common point onto an exit ramp that will then diverge into the loop ramp
and the straight ramp. Table 3.2 in the previous chapter summarizes the results of the
level of service (LOS) analysis for merge and diverge conditions for all alternatives.

The results show that ramp junctons are projected to operate acceptably for urban peak
time conditions.

b. Ramp Terminate Intersections

The overall intersection performance of the interchange ramp terminal intersections and
the future U/F campus intersection are summarized in Table 4.1. Figures 4.9 through 4.13
also summarize the intersection operate and document laneage assumptions. Also
included are projected intersection operations at the future North South Road/Marshalls
intersection. This intersection is located approximately 700 feet from the existing ramp
terminal intersection in the Diamond, Single-Point Urban, and Diamond with Flyover
configurations. In the partial cloverleaf configurations, it is integrated with the loop ramp
terminal intersection. One of the key assumptions included in these analyses is that the
cross-section of North South Road at a point under I-11 Freeway remains constant.

Other key assumptions are that adequate turning lane storage is provided and that closely-
Table 4-1

| Alternative Configuration | Full-Year Median Annual
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volume (Veh/Day)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Elevated intersections are considered to maximize efficiency in processing traffic. The individual intersection performances of the five alternatives are very similar.

Alternative 1, the Conventional Diamond configuration appears to provide the best combination of operation at both the arterial and ramp terminal intersections. The main merit is its ability to increase storage for the double left-bay traffic and its ability to respond to unseasonal increases in traffic demand, especially for the through lane in peak hour movement. Alternative 2, the Single Point Urban configuration is close to the Conventional Diamond in performance, but its conflict interaction does not occur as well as the Conventional Diamond's two separate ramp intersections. Alternative 3, the Diamond with Hybrid Flare provides excellent operation at the median ramp terminus intersection, but results in slightly worse LOSs at the median intersection. Alternatives 2 and 3, the Partial Diamond configurations are hampered by the need to combine operations at the interchange with operations at the U/I access and do not operate as well as the other alternative configurations.

D. Right-of-Way Requirements

The five interchange alternatives differ in the amount of right-of-way required to implement them. The partial diamond configurations need the most right-of-way due to minimum radius requirements for the loop ramp. If the diamond with Hybrid Flare configuration is constructed utilizing as much right-of-way as possible for the U/I access, it could also require a very significant amount of right-of-way.

Table 4-2 summarizes the additional right-of-way for the proposed alternatives. As shown, the single point urban configuration needs the least right-of-way, followed by the diamond configuration. The partial diamond alternatives require a large area for the loop ramp on the northbound quadrant and the diamond with Hybrid Flare ramp will probably require the most right-of-way.
## Table 4-2
Approximate Right-of-Way Requirements for Interchange Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Approximate Right-of-Way in Hectares</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NW Quad</td>
<td>SW Quad</td>
<td>NE Quad</td>
<td>SE Quad</td>
<td></td>
</tr>
<tr>
<td>1 Conventional Diamond</td>
<td>1.34</td>
<td>1.34</td>
<td>1.50</td>
<td>1.50</td>
<td>5.68</td>
</tr>
<tr>
<td>2 Partial Cloverleaf</td>
<td>5.62</td>
<td>1.34</td>
<td>0.04</td>
<td>1.50</td>
<td>8.50</td>
</tr>
<tr>
<td>3 Modified Partial Cloverleaf</td>
<td>5.62</td>
<td>1.34</td>
<td>1.34</td>
<td>1.50</td>
<td>9.89</td>
</tr>
<tr>
<td>4 Single Point Union</td>
<td>0.67</td>
<td>0.62</td>
<td>0.79</td>
<td>1.06</td>
<td>3.34</td>
</tr>
<tr>
<td>5 Combined Diamond Cloverleaf</td>
<td>1.34</td>
<td>&gt;3.00</td>
<td>&gt;3.00</td>
<td>1.50</td>
<td>&gt;8.84</td>
</tr>
</tbody>
</table>

## E. Cost Considerations
The cost of implementing an interchange configuration is an important component in identifying a preferred alternative. Table 4-3 summaries planning level construction cost estimates for the five alternative interchange configurations in 1997 dollars.

## Table 4-3
Cost Considerations for Interchange Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Planning Level Construction Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Conventional Diamond</td>
<td>$573 million</td>
</tr>
<tr>
<td>2 Partial Cloverleaf</td>
<td>$40 million</td>
</tr>
<tr>
<td>3 Modified Partial Cloverleaf</td>
<td>$41 million</td>
</tr>
<tr>
<td>4 Single Point Union</td>
<td>$526 million</td>
</tr>
<tr>
<td>5 Combined Diamond Cloverleaf</td>
<td>$407 million</td>
</tr>
</tbody>
</table>

Alternative 1, the Conventional Diamond is the least costly configuration followed closely by Alternative 2, the Partial Cloverleaf interchange (PCLI) configuration. Alternatives 3 and 4, the Modified Partial Cloverleaf and Single Point Union configurations, fall into the next group of costs, while Alternative 5, the Combined Diamond Cloverleaf is the most expensive.

## F. Environmental Factors
The five interchange alternative have differing physical footprints, both horizontally and vertically. These differ, therefore, in their differing levels of environmental factors. The following environmental factors were evaluated.
G. Selection of Preferred Alternative

1. Evaluation of Criteria

Table 4-4 summarizes the criteria evaluated.

- Traffic operations
- Right of Way
- Cost Considerations
- Environmental

Table 4-4

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Operations</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Right of Way</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Construction Cost</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>Environmental</td>
<td>0 0 0 0 0</td>
</tr>
</tbody>
</table>

Legend: + = better, 0 = average, - = worse

Based on this evaluation, Alternative 6, the Combination Crossroad/Grade, is eliminated from further consideration. Although it would provide an interchange ramp terminal level of service (LOS), its projected long-term and adjacent intersection operations are

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expected to be similar to the other alternatives. The flyover ramp would need significant
right-of-way, even if most of the ramp were on structure. Phasing level estimates of
construction cost for this configuration are the most expensive of the two alternative
configurations. Environmentally, the flyover ramp will have visual and noise projection
impacts to development within the Ewa plan.

The diamond and Single Point Urban Interchange (SPUI) configurations are similar to each
other in the evaluation criteria. Traffic operations at the ramp terminal intersections are not
projected to be as good as the partial cloverleaf configurations. Although these
interchanges require less right-of-way and are less costly than the partial cloverleaf
configurations, they are less flexible in accommodating changes in future traffic conditions.
Alternative 4, the SPUI must be constructed all at once due to the clear span structure and
ramp configuration. Phased construction of this type of interchange is not feasible. Once
built, it is not easily expanded. Alternative 3, the Conventional Diamond can be expanded
later, but that expansion is likely to result in a partial cloverleaf configuration such as the
reconstruction that occurred at the Kuna Interchange.

Given that the development of Kailua was not assumed in the future analysis, there is
the potential that the demand for the Waianae-bound to Makaha-bound traffic movement
could be greater than projected. Therefore, it is recommended that the partial cloverleaf
configurations be selected as the preferred configurations. They would allow the maximum
flexibility for future growth and could be phased in construction so as to match the growth
of the Ewa plan.

Alternatives 2 and 3 have similar partial cloverleaf configurations, however, alternative 3,
the Modified Partial Cloverleaf, is recommended based on the following reasons:

- Alternative 2 results in one less intersection on North-South Road. Even though this
  road serves a right turn movement only, it requires construction of a separate ramp.
  Alternative 3 combines all movements into one loop ramp.
APPENDIX D

TRAFFIC ANALYSIS
A copy of Appendix D – Traffic Study (Draft Interstate Access Modification Request Report Technical Appendices for the North-South Road Study) can be viewed at the State Department of Transportation, Highway Planning Branch or the City and County of Honolulu, Department of Transportation Services
NORTH-SOUTH ROAD AND KAPOLEI PARKWAY PROJECT

Air Quality Technical Report

Prepared by:

PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

June 2004

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<td>Particulate Matter</td>
<td>5</td>
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<td>Sulfur Oxides</td>
<td>5</td>
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<td>Lead</td>
<td>6</td>
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<td>NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS</td>
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<td>MICROSCALE ANALYSIS</td>
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<tr>
<td>Traffic Heterogeneity</td>
<td></td>
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</table>

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INTRODUCTION

The purpose of this report is to describe the air pollutants associated with motor vehicle exhaust, determine applicable standards and regulations, examine the existing air quality conditions in the study area, and identify and quantify the possible air quality impacts of the construction of the North-South Road and Kapolei Parkway Corridor.

PROJECT DESCRIPTION

The North-South Road would be a federal aid, limited access, pre-cast concrete highway that would connect Interstate Route H-1 (H-1 Freeway) to the proposed Kapolei Parkway, and is approximately 2.2 miles in length (see Figure 1). The North-South Road project also includes the construction of (1) a major interchange at its junction with the H-1 Freeway, (2) the North-South Road/Kapolei Parkway interchange, and (3) various drainage features, such as a drainage channel and detention basins associated with the proposed Highway, as well as two bridges over Kalihi Place. The roadway section closest to the Kapolei Parkway is approximately 0.7 miles in length and is a proposed federal aid, arterial roadway which would connect the proposed North-South Road to an arterial roadway portion of the Kapolei Parkway. North South Road would be a state facility, Kapolei Parkway is programmed as a City facility, to be constructed by the City's Department of Design and Construction (DDC).
PURPOSE AND NEED FOR ACTION

The purpose of this project is to address various types of transportation needs including:

- To meet roadway capacity needs for existing travel demand;
- To respond to regional land use and economic development trends;
- To meet future transportation demand; and
- To improve sub-regional mobility.

Roadway Capacity Need for Existing Travel Demand

Traffic volumes on Maui's arterial roadways reflect recent rapid urban development shown in Table 5-1. From 2000 to 2001, growth in traffic volumes on existing roadways ranged from 56 percent to 209 percent.

Fort Weaver Road repeatedly reaches near capacity conditions during both the AM and PM peak hours. In the AM peak period, approximately 85 percent of northbound vehicles on Fort Weaver Road access the westbound H-1 Freeway via the Russel Interchange; regularly causing queues from the front way to the Fort Weaver Road/Saukau Highway Interchange. In the PM peak period, the existing traffic volumes on Fort Weaver Road have already exceeded capacity. While plans to widen Fort Weaver Road from four to six lanes in the next three years will help, it will be insufficient to accommodate future travel growth in the area.

At Fort Barnes Road, traffic operations are congested during both the AM and PM peak hours. Particularly notable is the congestion at the Fort Barnes Road/Pauwela Highway intersection, causing major backup queues during the AM peak hour and eastbound queues during the PM peak hour.

The H-1 Freeway in the study area is affected by upstream congestion during the AM peak period. Recent improvements at the Russel interchange have mitigated slight peak period vehicle queues that used to back up on the westbound off-ramp at the Russel interchange. Similarly, at the Ehaa interchange in the eastern direction, PM peak period delays on the westbound off-ramp that, at times, extended onto the freeway has been mitigated by recent improvements to the ramp.
### Table 5-1: Traffic Volume Trends

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Weaver Road</td>
<td>North of Farrington Highway</td>
<td>45,000</td>
<td>70,000</td>
<td>56%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>South of Farrington Highway</td>
<td>34,000</td>
<td>61,000</td>
<td>79%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>At Honolulu Bridge</td>
<td>33,000</td>
<td>57,000</td>
<td>73%</td>
<td>2%</td>
</tr>
<tr>
<td>Fort Barretto Road</td>
<td>South of Interstate H-1</td>
<td>12,000</td>
<td>36,000</td>
<td>206%</td>
<td>10%</td>
</tr>
<tr>
<td>Interstate H-1</td>
<td>East of Kuna Interchange</td>
<td>74,000</td>
<td>140,000</td>
<td>89%</td>
<td>5%</td>
</tr>
</tbody>
</table>

These recent improvements address only the existing traffic demand. It is projected that future travel demand at the Kuna and Kukui Interchanges will exceed capacity, adversely affecting conditions on the H-1 Freeway. Therefore, construction of new roadways and interchanges, as well as improvements to existing roadways and interchanges, is needed to address continuing regional urban development, as directed by current State and City policy.

The projected North-South Road would attract much of the traffic, which would otherwise flow on Fort Weaver and Fort Barretto Roads. Diverting traffic to North-South Road would improve operating conditions on Fort Weaver and Fort Barretto Roads, allowing these other roadways to serve their travel markets better. Similarly, the North-South Road Interchange would relieve projected congested operations on H-1 Freeway at the Kuna and Makakilo Interchanges.

### Regional Land Use and Economic Development Trends

The Ewa region, as defined by the Ewa Development Plan (Ewa DP), had a population of 68,716 in 2000 (as defined by the City and County of Honolulu designated Ewa DP Area), approximately 8 percent of Oahu’s total population. In contrast, the estimated population of the Ewa DP Area in 1990 was approximately 42,000 persons, 5 percent of the island total. In 2005, the estimated population of Oahu will be approximately 1.03 million. According to the City and County of Honolulu General Plan’s population guidelines, the Ewa DP Area is intended to accommodate 13 percent of Oahu’s 2025 population, or roughly 133,874 persons—a percent increase of 5 percent from 2000 (U.S. Census, 2000; Ewa DP, Revised 2000, State of Hawaii Department of Business, Economic Development and Tourism, Population And Economic Projections For The State Of Hawaii To 2025, 2000).

### Future Transportation Demand

It is the objective of the State and County to create a "Second-City" for Oahu in the Ewa area, by providing opportunities for residential and employment growth to supplement the Primary Urban Center (FUC). The FUC Plans will experience the largest population, employment, and housing growth over the 25-year period between 2000 and 2025. By the year 2025, local population in the Ewa Plans will be over 116,000; up 65% from 2000, with a corresponding growth in housing of 71% to over 36,000 units. Public and private developers have factored achievement of this objective, and a number of projects are currently under construction, or planned, including several residential developments in Ewa, Kapolei, East Kapolei, Makakilo, and employment centers in areas such as the City of Kapolei, Campbell Industrial Park, East Kapolei, Ewa, and Ewa Beach.

Regional transportation improvements are needed to accommodate this anticipated growth in Ewa, and the North-South Road is one component of the proposed regional improvements in the TOD 2025.
North-South Road and Kapolei Parkway

Sub-regional Mobility

Providing an alternative facility to Fort Weaver Road and Fort Baratone Road will reduce congestion on these roadways, improving transportation conditions for traffic in the Ewa Plain. Moreover, North-South Road and Kapolei Parkway would help improve travel between activity centers within the Ewa Plain by providing alternative routes to improve overall system operation. Currently, travelers wanting to drive between points in Ewa have limited options, forcing many to use roadways such as Fort Weaver Road and Fort Baratone Road to serve both mauka-makai demand and east-west demand. East-west connectivity is provided primarily by Farrington Highway and H-1 Freeway. Providing alternative roadway connections within the Ewa Plain will relieve both existing mauka-makai and east-west roadways thereby providing better sub-regional mobility.

ALTERNATIVES

Project alternatives were identified through discussions with government agencies and input gathered at public meetings. Alignment, interchange, and roadway concept alternatives, including a Transportation System Management (TSM) alternative, were examined. A preferred Build Alternative and a No-Build Alternative were selected for detailed examination in this EA, and are described below.

No-Build Alternative

The future No-Build Alternative assumes the roadway improvements as the TOP 2025, except the North-South Road interchange and North-South Road, describing a future roadway network that includes some improvements to the Ewa Plain. Figure 5.5 illustrates the 2025 No-Build Alternative roadway network. No Build Alternative assumes that Kapolei Parkway is complete from Ewa Beach through the City of Kapolei by 2025, including the segment between Ralton Road and North-South Road. However, that segment of Kapolei Parkway would not be in place within the time limit of the No-Build Alternatives 2025. The projects of the segment of the Kapolei Parkway is consistent with City plans for the future completion of Kapolei Parkway, but reflects current City budgetary constraints which make the timing of the project completion uncertain. Because the City owns the property on which Kapolei Parkway is proposed, the roughly 10-acre ROW for the Kapolei Parkway is being established by subdividing the property and sharing its disposal.

Build Alternative

The preferred Build Alternative (also called the "Kaloli Corridor alignment" and described in more detail in Chapter 2) assumes the construction of the North-South Road and the widening of a segment of Kapolei Parkway between North-South Road and Ralton Road.

North-South Road would ultimately be a six-lane, divided highway between the H-1 Freeway and Kapolei Parkway, connecting with the Kapolei bypass loop interchange (Kaloli Parkway) and the TOP 2025. In order to ensure that the key OHA segment of the Kapolei Parkway between Ralton Road and North-South Road is completed the same time frame as the opening of North-South Road, this segment is proposed to be "flexibilized." The proposed segment of Kapolei Parkway would ultimately be a six-lane, divided roadway, connecting the proposed North-South Road to existing, southern portions of the Kapolei Parkway.

North-South Road would intersect Kapolei Parkway between the existing Vista and Tenney Villages in the Ewa Villages development. The roadway would proceed north to the proposed interchange of the H-1 Freeway following an existing easement retained for a major north-south roadway. The Build Alternative also indicates a new conventional diamond interchange with the H-1 Freeway, as well as interactions with the existing Farrington Highway and proposed interactions with other future roadways that would be connected between Farrington Highway and Kapolei Parkway. The preferred Build Alternative would provide regional access to the interstate system on an as-needed basis and transport the proposed road would include three lanes in each direction, a median, and sidewalks.

The right-of-way (ROW) for the Kapolei Parkway is currently owned by the City & County of Honolulu and is roughly 9.5 acres. The HDOV for North-South Road would either be obtained through a Government's Easement Order (GEO) or acquired from a private developer. The southern 10.4 acre portion of the North-South Road right-of-way is owned by the State, but would be transferred to City from the Department of Land and Natural Resources (DLNR) to HDOV. The northern 4.7 acre portion is currently owned by the Estate of James Campbell and would have to be acquired by the State.

At the interchange, a tunnel would be acquired and the width would be required entirely for the conventional diamond interchange. The diamond interchange requires approximately 9.5 acres. An additional 11 acres would be required for the loop ramp expansion. The additional acreage would be acquired to provide the option of a westbound to northbound off ramp in the future, when warranted by traffic volumes. While some of the additional acreage is part of the preferred alternative assessed in this Draft EA, the possible construction of a loop ramp is not addressed in this document.

RELEVANT POLLUTANTS

Air quality impacts are illustrated by the determination of emission levels. "Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity of crops or natural vegetation, or by reducing human or animal health.

Six air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide. These pollutants are carbon monoxide, nitrogen oxides, ozone, particulate matter, sulfur oxides, and lead.

Carbon Monoxide
Carbon monoxide (CO) is a colorless and odorless gas which is generated in the urban environment primarily by the incomplete combustion of fuel in motor vehicles. Relatively high concentrations of CO are typically found near crowded intersections and along heavy

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used roadsides carrying slow-moving traffic. CO chemically combines with the hemoglobin in the red blood cells to decrease the oxygen-carrying capacity of the blood. Prolonged exposure can cause headaches, dizziness, or loss of equilibrium.

Nitrogen Oxides
Nitrogen oxides (NOx) constitute a class of compounds that include nitrogen dioxide (NO2) and nitric oxide (NO). Both of which are emitted by motor vehicles and stationary sources. Although NO2 and NO can irritate the eyes and nose and impair the respiratory system, NOx is of concern primarily because most of these compounds react in sunlight to form photochemical oxidants, including ozone. This reaction occurs comparatively slowly and ordinarily takes place far downwind from the site of actual pollutant emission.

Nitrogen oxides (NOx) constitute a class of compounds that includes nitrogen dioxide (NO2) and nitric oxide (NO), both of which are emitted by motor vehicles. Although NO2 and NO can irritate the eyes and nose and impair the respiratory system, NOx is also of concern primarily because of its role in the formation of ozone.

Ozone
Ozone (O3) or photochemical oxidants, is a major cause of lung and eye irritation in an urban environment. It is formed through a series of reactions involving HC and NOx which take place in the atmosphere in the presence of sunlight. Relatively high concentrations of O3 are normally found only in the summer.

Particulate Matter
Particulate pollution is composed of solid particles or liquid droplets that are small enough to remain suspended in the air. In general, particulate pollution can include dust, soil, and silt dust; these can be irritating but usually are not poisonous.

Particulate pollution also can include bits of solid or liquid substances that can be highly toxic. Of particular concern are those particles that are smaller than, or equal to, 10 microns (PM10) and 2.5 microns (PM2.5) in size. Data collected through numerous nationwide studies indicates that most of the PM10 comes from

- Fugitive dust
- Wind erosion
- Agricultural and forestry sources

A small portion of particulate matter is the product of fuel combustion processes. In the case of PM10, the combustion of fossil fuels accounts for a significant portion of this pollutant. The main health effect of airborne particulate matter is on the respiratory system.

Sulfur Oxides
Sulfur oxides (SOx) constitute a class of compounds of which sulfur dioxide (SO2) and sulfur trioxide (SO3) are of great importance. The health effects of SOx include respiratory tract sensitivity and bronchial constriction. Relative to SO2, SOx is emitted from motor vehicles.

Lead
Lead is a stable element which persists and accumulates both in the environment and in animals. Its principal effects in humans are on the blood-forming, nervous, and renal systems. Historically, motor vehicles contributed the major source of lead emissions to the atmosphere.

NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS

As required by the Clean Air Act, National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: carbon monoxide, nitrogen oxides, ozone, particulate matter smaller than 10 microns (PM10), sulfur oxides, and lead. The State of Hawaii has also established its own standards for these pollutants. Both the National and State ambient air quality standards are summarized in Table 1. The "primary" standards are intended to protect the public health, while the "secondary" standards are intended to protect the public welfare and to protect the environment and aesthetic qualities of the environment. The State of Hawaii uses its ambient air quality standards in terms of health.
Table 1
National and State Ambient Air Quality Standards

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<thead>
<tr>
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<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1 Hour</td>
<td>10 µg/m³ (9 ppm)</td>
<td>40 µg/m³ (35 ppm)</td>
</tr>
<tr>
<td></td>
<td>8 Hour</td>
<td>5 µg/m³ (4.5 ppm)</td>
<td>10 µg/m³ (9 ppm)</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>1 Hour</td>
<td>---</td>
<td>40 µg/m³ (35 ppm)</td>
</tr>
<tr>
<td></td>
<td>24 Hour</td>
<td>200 µg/m³</td>
<td>160 µg/m³</td>
</tr>
<tr>
<td>Particulate Matter</td>
<td>24 Hour</td>
<td>150 µg/m³</td>
<td>150 µg/m³</td>
</tr>
<tr>
<td></td>
<td>Annual (Arithmetic)</td>
<td>65 µg/m³</td>
<td>65 µg/m³</td>
</tr>
<tr>
<td>PM-2.5</td>
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*Designated to prevent against adverse effects on public health

**Designated to prevent against adverse effects on public welfare, including effects on comfort, visibility, vegetation, animals, aesthetic values, and saving and deterioration of materials.

*Particulate Matter which is 10 microns or less in diameter.

**Particulate Matter which is 2.5 microns or less in diameter.

Source: State of Hawaii, Department of Health, Clean Air Branch

AIR QUALITY REGULATIONS AND PLANNING

Clean Air Act Amendments of 1990

The Clean Air Act Amendments of 1990 (CAA) and the Final Conformity Rule (40 CFR Parts 51 and 93) direct the EPAs to implement environmental policies and regulations that will ensure acceptable levels of air quality.

The Clean Air Act and the Final Conformity Rule effect proposed transportation projects such as the 26 Mile Road Project. According to Title I, Section 117 (c)(2)

"No federal agency may approve, accept or fund any transportation plan, program or project unless..."

The Final Conformity Rule defines conformity as follows:

Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards.

That such activities will not:

i. Cause or contribute to any new violation of any NAAQS in any area.
ii. Increase the frequency or severity of any existing violation of any NAAQS in any area.
iii. Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area.

The determination of conformity is to be based on the most recent estimates of pollutant emissions, and such estimates are to be determined from the most recent population, employment, travel, and congestion estimates as determined by the responsible metropolitan planning organizations or other agency authorized to make such estimates.

AMBIENT AIR QUALITY IN THE STUDY AREA

Local Meteorology

The climate of Hawaii is relatively moderate throughout most of the State, although some differences in certain meteorological parameters may occur from one region to another. Most of these differences are caused by the islands' mountainous topography.

The topography of Oahu consists of two nearly parallel mountain ranges (Windward and Ko'olau) trending northwest to southeast and separated by Koolau Plateau. A large, relatively flat, gently sloping coastal plain borders the plateau on the south. The Ewa Plain lies within this coastal plain.

The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. The average frequency of the northeast trade winds vary from more than 90 percent during the summer to 50 percent in January. This accounts for the winter climate on the windward (north and northeast) sides.
of the islands in comparison to kohada areas (south and southwest) Words from the south are infrequent, occurring only a few times during the year and mostly in winter in association with kona storms.

Rainfall on Oahu is highly variable depending on elevation and location with respect to the trade winds. The Ewa area has a moderately dry climate. The Waianae coast is the driest area on Oahu, where rainfall drops to about 20 inches a year.

At the Honolulu airport temperatures have been recorded as high as the lower 90s and as low as the lower 60s.

During the past 30 years, over 130 storms have passed through or near the area or moved to the west of the islands. Storms originating from the long-Pacifio usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, both fishermen and workers, which normally turn in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, in 1982 and 1992, caused the most damage to Kona. However, numerous gale warning had been issued during these storms.

Attainment Status of Study Area

Section 107 of the 1997 Clean Air Act Amendment requires the EPA to publish a list of all geographic areas in compliance with the NAAQS, as well as those not attaining the NAAQS. Areas not in compliance with the NAAQS are termed nonattainment areas. Areas which have insufficient data to make a determination are unclassified, and are treated as being attainment areas, if proven otherwise. The designation of an area is made on a pollutant by pollutant basis.

The State of Hawaii is designated as an attainment area for CO, O₃, PM₁₀, and PM₂.₅.

Monitored Air Quality

Air pollutant levels in Hawaii are monitored by a network of sampling stations operated under the supervision of the State Department of Health (DOH) at various locations around Oahu. The monitoring locations used for this study are listed in Table 2, with a summary of the pollutants that are monitored at each station. Although some of the air monitoring stations are located in the project area, they are relevant to the project area and the pollutant data monitored at these stations are representative of the air quality conditions within the project study limits.

**IMPACT ASSESSMENT**

Pollutants for Analysis

Pollutants that can be biased primarily, or in large measure, to motor vehicles are those that are of reference in evaluating the impacts of the project. These include CO, HC, NOₓ, O₃, and particulate matter (PM₁₀ and PM₂.₅). Detailed analyses for these contaminants are not warranted.

Motor vehicles have historically contributed a major source of lead emissions to the atmosphere. As already noted, lead levels have decreased significantly, and the continued, due to the mandated decrease and elimination of lead in gasoline. Therefore, a detailed analysis of the impact of lead emissions is also not warranted.
**Meteorological Conditions**

The exposure and concentration of pollutants emitted from motor vehicles are influenced by several meteorological factors: wind direction, wind speed, and the temperature profile of the atmosphere. The values for these parameters were chosen to maximize pollutant concentrations at each receptor site (i.e., to establish a conservative worst case situation).

- **Wind Direction**: Maximum CO concentrations are generally found when the wind is blowing approximately parallel to a single roadway adjacent to the receptor location. At complex intersections, however, it is difficult to predict which wind angle will result in maximum CO concentrations. At each receptor location, therefore, the approximate wind angle that would produce maximum pollutant concentration was used in the analysis. All wind angles between 0° to 180° (in 10° increments) were considered.

- **Wind Speed**: CO concentrations are greatest at low wind speeds. The EPA recommends the use of a wind speed of 2.2 miles per hour (1 meter per second). The average mean monthly wind speed, as measured at the Honolulu Airport over the last 40 years is 9.4 miles per hour (4.2 meters per second). Given EPA general recommendations and actual measured data, a conservation wind speed of 4.4 miles per hour (2 meters per second) was used to predict CO concentrations during the peak traffic period.

- **Profile of the Atmosphere**: A 'mixing height' refers to the height in the atmosphere to which pollutants will rise of 1000 meters, and 'O' or neutral atmospheric stability conditions were used in estimating microscale CO concentrations. The selection of these meteorological parameters was based on recommendations from the Hawaii Department of Transportation and the EPA. The data was found to be the most representative of the conditions existing along the project area.

The CO levels estimated by the model will generally be the maximum concentrations which could be expected to occur at any air quality monitor site analyzed because they assume the simultaneous occurrence of all worst case parameters: peak hour traffic conditions, unfavorable vehicular operating conditions, low wind speeds, low atmospheric temperature, neutral atmospheric conditions, and the maximum wind direction.

**Persistence Factor**

Peak hour concentrations of CO were obtained by multiplying the highest peak hour CO estimates by 7. This factor, recommended by USEPA, takes account of the fact that over eight hours ( excluding from a single hour) vehicle volumes will fluctuate downwards from the peak, vehicle speeds may vary, and meteorological conditions (including wind speed and wind direction) will change to some degree compared to the very conservative assumptions used for the peak hour.

**Analysis Years**

Microscale modeling analyses have been performed for the existing year (2004) and the project's design year of 2025.

**Background Concentrations**

Microscale modeling is used to predict CO concentrations resulting from emissions from motor vehicles using roadways immediately adjacent to the location at which predictions are being made. A CO "background" level must be added to this value to account for CO entering the area from other sources upstream of the location at which predictions are being made.

_June 2004_
A one-hour CO background level of 1.1 ppm and an eight-hour background level of 0.4 ppm were added to the mobile source results at each analysis site. These values are the second-highest one-hour and eight-hour readings from the West (Ewa) Beach monitoring station in the City and County of Honolulu, for the years 2001 - 2003.

Traffic Information
Traffic data for the air quality analysis was derived from traffic counts and other information developed as part of the overall traffic analysis for study. The mesoscale carbon monoxide analysis involved the period when maximum traffic volumes occur on local streets and when the greatest traffic and air quality impacts of the proposed project are expected.

Appendix D contains all traffic information used for the air quality analysis.

SUMMARY OF POTENTIAL IMPACTS

Meso-scale Impacts
Inasmuch as the change in regional VMT levels is predicted to be minor, no regional air quality analysis was conducted.

Micro-scale Impacts
Maximum 1-hour and 8-hour carbon monoxide levels were predicted at sensitive receptor sites within the proposed North-South Corridor study area. The results of this analysis are given in Tables 3 and 4.

The levels predicted in this analysis are expected to be the highest meso-scale impacts due to the project within the study area. The sites analyzed are located near congested intersections that generally have elevated air quality levels due to emissions from vehicle queuing. No violations of the Federal or State one or eight hour CO standards are predicted.

As the project is predicted to not cause or exacerbate a violation of the applicable air quality standards, and is generally improving the predicted air quality levels in the study area, it conforms to the goals set forth in the New Clean Air Act.

CONFORMANCE WITH THE STATE IMPLEMENTATION PLAN (SIP) FOR AIR QUALITY

The State of Hawaii has been classified as an attainment area for O3, PM2.5, and CO. As a nonattainment area, the State must demonstrate that the National Ambient Air Quality Standards (NAAQS) will not be violated. The mesoscale analysis for the North-South Corridor demonstrates that no violations of the National Ambient Air Quality Standards are predicted. The goals set forth in the New Clean Air Act Amendments of 1990 are to show that no violations of these standards are created or worsened. The project meets these goals and as such will not affect the State of Hawaii's current attainment status.

The North-South Corridor project has been included in the State of Hawaii Fiscal Year 2004-2006 Statewide Transportation Improvement Program (STIP), approved on December 8, 2003. The STIP is a multi-year, multi-modal transportation and current highway, transit, and transportation improvement program that has been developed using existing transportation plans and policies. The goals set forth in the New Clean Air Act Amendments of 1990 are to show that no violations of these standards are created or worsened. The project meets these goals and as such will not affect the State of Hawaii’s current attainment status.

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Note: State of Hawaii Standard 1.5 ppm
Federal Standard 1.0 ppm
Background Level 0.1 ppm

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Note: State of Hawaii Standard 4.5 ppm
Federal Standard 3.5 ppm
Background Level 2.4 ppm
MITIGATION MEASURES

Since there would be no adverse air quality impacts, mitigation would not be necessary. Measures to minimize construction emissions are suggested in the following section.

CONSTRUCTION IMPACTS ON AIR QUALITY

The air quality impacts of the proposed action would be limited to short-term increased fugitive dust and mobile source emissions during construction.

Fugitive Dust Emissions

Fugitive dust is airborne particulate matter, generally of a relatively large particulate size. Construction-related fugitive dust would be generated by haul trucks, concrete trucks, delivery trucks, and other earth-moving vehicles operating around the construction sites. This would be due primarily to particulate matter resuspended (picked up) by vehicle movement over paved and unpaved roads and other surfaces, dirt tracked onto paved surfaces from unpaved areas at access points, and material blown from uncovered haul trucks.

Generally, the distance that particles drift from their source depends on their size, emission height, and wind speed. Small particles (50 to 100 micrometers) can travel several hundred feet before settling to the ground, depending on wind speed. Fugitive dust, however, is made up of relatively large particles (i.e., particles greater than 100 micrometers in diameter). These particles are responsible for the reduced visibility often associated with this type of construction. Given their relatively large size, these particles tend to settle within 20 to 50 feet of their source.

In order to minimize the amount of construction dust generated, the guidelines below should be followed. Since the project is in a PM10 non-attainment area, all the proposed particulate control measures related to construction activities should be followed. The following preventative and mitigative measures should be taken to minimize the possible particulate pollution problem:

I. Site Preparation

A. Minimize land disturbance;
B. Use water trucks to minimize dust;
C. Cover trucks when hauling dirt;
D. Stabilize the surface of dirt piles if not removed immediately;
E. Use windbreaks to prevent any accidental dust pollution;
F. Limit vehicular paths and stabilize those temporary roads; and
G. Pave all unpaved construction roads and parking areas to road grade for a length no less than 50 feet where such roads and parking areas exit the construction site to prevent dirt from washing onto paved roadways.

II. Construction

A. Cover trucks when transferring materials;
B. Use dust suppressants on traveled paths which are not paved;
C. Minimize unnecessary vehicle and machinery advances; and
D. Minimize dirt back-out by washing or cleaning trucks before leaving the construction site (alternative to this strategy is to pave a few hundred feet of the exit road, just before entering the public road).

III. Post Construction

A. Revegetate any disturbed land not used;
B. Remove unused material;
C. Remove excess fill;
D. Revegetate all vehicular paths created during construction to avoid future soil-erosion vehicle activities.

Mobile Source Emissions

As discussed previously, carbon monoxide (CO) is the principal pollutant of concern when considering localized air quality impacts of motor vehicles. Since emissions of CO from motor vehicles increase with decreasing vehicle speed, dilution of traffic during construction could result in short-term elevated concentrations of CO. The temporary reduction of roadway capacity and the increased queue lengths in order to minimize the amount of emissions generated, every effort should be made during the construction phase to limit disruption to traffic, especially during peak travel periods.
REFERENCES


APPENDIX A
Ambient Air Quality Monitoring Data
Appendix C

CAL/ID/CO2 Data and Objectives

A copy of the full report, including this Appendix can be viewed at the State Department of Transportation, Highway Planning Branch or the City and County of Honolulu, Department of Transportation Services.
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Services
APPENDIX F

NOISE TECHNICAL REPORT
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## 1. INTRODUCTION

The purpose of this report is to analyze the traffic noise impacts of the proposed North-South Road and Kapolei Parkway project in Ewa, Oahu, Hawaii. This study was prepared in accordance with Federal Highway Administration (FHWA) rules and procedures and the State of Hawaii Department of Transportation (HDOT) Traffic Analysis and Abatement Policy. Its elements include:

1. Measurements of existing noise levels at representative noise sensitive receivers,
2. Prediction of future traffic noise levels,
3. Comparison of existing and projected future traffic noise levels with the FHWA Noise Abatement Criteria (NAC),
4. Preparation of noise contours to provide guidance for future developments,
5. Recommendations to reduce noise impacts,
6. Evaluation of possible noise barriers, and
7. The effects of construction noise and proposed mitigation measures.

## 2. PROJECT DESCRIPTION

The HDOT and the FHWA propose to construct North-South Road in Ewa, Oahu, Hawaii (see Figure 1). The proposed roadway would be a principal arterial highway, that would connect interstate Route H-1 (I-1 Freeway) to the proposed Kapolei Parkway, and is approximately 2.2 miles in length. The North-South Road project also includes the construction of: (1) a major interchange at its junction with the H-1 Freeway, (2) the North-South Road/Kapolei Parkway intersection, and (3) various drainage features, such as a drainage channel and detention basin associated with the proposed highway, as well as two bridges over Ka'a Gulch. The roadway section of concern for the Kapolei Parkway is approximately 0.7 miles in length and is a proposed federal aid arterial roadway which would connect the proposed North-South Road to existing southernly portions of the Kapolei Parkway. North-South Road would be a State facility. Kapolei Parkway is proposed as a City facility, to be constructed by the City's Department of Design and Construction (DDC).

The following alternatives are under consideration:

1. No Build Alternative — The future No Build Alternative assumes the roadway improvements in the TCP 2025, except the North-South Road interchange and North-South Road, detouring a future roadway network that includes some improvements for the Ewa Plan. No Build Alternative assumes that Kapolei Parkway is complete from Ewa Beach through the City of Kapolei by year 2025, including the segment between Fishermans Road and North South Road. However, that segment of Kapolei Parkway would not be in place within the time frame to match initial implementation of the proposed North-South Road. The inclusion of this segment of the Kapolei Parkway is consistent.
with City plans for the future completion of Kapolei Parkway, but reflects current City budgetary constraints which make the timing of this project completion uncertain. Because the City owns the property on which Kapolei Parkway is proposed, the roughly 10-acre ROW for the Kapolei Parkway is being established by identifying the parcel and changing its designation.

The No Build Alternative assumes a 795 bus test by 2025. This reflects the Regional Bus Rapid Transit (BRT) system proposed as part of the Primary Corridor Transportation Project, which is part of the T&O 2025. However, because North South Road and its interchange with H-1 Freeway does not exist in the No Build Alternative, the proposed North South Road Park and Ride is also assumed not to exist. In fact, the Regional BRT and local bus and minibus routes that would otherwise interchange with the proposed North South Road Park and Ride would need not be included to other transfers elsewhere. This assumption lowers the efficiency of transit service to the Ewa Plain area.

2. Build Alternatives: The preferred Build Alternative (also called the "Waipio Corridor alignment") assumes the construction of the North South Road and the lateralization of a segment of Kapolei Parkway between North South Road and H-1 Freeway. North South Road would ultimately be a six-lane, divided highway between the H-1 Freeway and Kapolei Parkway, consistent with the Kapolei Area Long-Range Master Plan (July 1998) and the T&O 2025. In order to ensure that the key 0.67-mile section of the Kapolei Parkway between North South Road and North South Road is completed within the same timeframe as the opening of North South Road, this segment is proposed to be "Forwarded." The proposed segment of Kapolei Parkway would ultimately be a six-lane arterial roadway, connecting the proposed North South Road to existing, southerly portions of the Kapolei Parkway.

North South Road would intersect Kapolei Parkway between the existing Vaaou and Tennyson Villages at the Ewa Villages development. The roadway would proceed north to the proposed interchange at the H-1 Freeway following an existing existing right-of-way reserved for a major north-south roadway. The Build Alternative also includes a new conventional diamond configuration interchange with the H-1 Freeway, as well as interchanges with the existing Farrington Highway and proposed intersections with other future roadways that would be constructed between Farrington Highway and Kapolei Parkway. The preferred Build Alternative would provide a pedestrian access to the interchange system as well as local access and circulation. The proposed road would include two lanes in each direction, a median, and sidewalks.

The right-of-way (ROW) for the Kapolei Parkway is currently owned by the City of Honolulu and is mostly 96 feet wide. The ROW for North South Road would either be obtained through a Governor's Executive Order (EO) or acquired from a private landowner. The eastern 0.44-acre portion of the North South Road right-of-way is owned by the State, but would be transferred by EO from the Department of Land and Natural Resources (DLNR) to BID. The northern 1.5-acre portion is currently owned by the Estate of James Campbell and would have to be acquired by the State.
3. EXISTING CONDITIONS

3.1 Background

Noise is defined as any sound that is undesirable or interferes with normal human activities. The decibel (dB) scale is used to quantify sound intensity and represents the ratio between a given sound and the faintest sound detectable by human hearing. Because sound pressure levels vary widely within the range of human hearing, the dB scale is logarithmic. The human ear is not equally sensitive to all frequencies within the entire sound spectrum. Accordingly, noise measurements are made using an A-weighting (dB(A)) scale to correspond to human perceptions of noise. A scale sound levels are measured in many communities and city noise ordinances and in some states and city highways or traffic noise codes.

Time variation in noise exposure is typically accounted for as a constant energy level equivalent (L eq) for a given time period. The L eq is the constant noise level over some specified period of time that is equivalent to energy in a fluctuating (or time) noise "averaged" over that period of time. L eq is also a function of time and is expressed as L eq (time period). For example, L eq(A) is expressed in A-weighted decibels (dBA). The calculated constant noise over one hour which is equivalent in total energy to the varying noise levels actually measured during that one hour.

3.2 Noise Standards

The FHWA Noise Analysis and Abatement Policy implements FHWA regulations on noise abatement (23 CFR 772) for the State of Hawaii. The regulations and policy require that a noise analysis be performed whenever potentially affected residents exist, when all developed lands or lands that are planned, designed or programmed for future use.

The FHWA has established Noise Abatement Criteria (NAC), shown on Table 1, for different exterior and interior land use activities. The NAC do not constitute legally enforceable standards, but represent a yardstick for evaluating the affect of noise on the surrounding community. The NAC have been adopted by the State of Hawaii as its standard.

Under HOOT policy, a noise impact occurs when the predicted traffic noise levels approach or exceed the NAC, or when the predicted traffic noise levels substantially exceed the existing noise levels. "Approach" means at least 1 dBA less than the NAC, and "substantially exceed" means an increase of at least 15 dBA. If the NAC are approached or exceeded, or if there is a substantial increase above the existing noise level, noise abatement measures must be considered.

Changes in traffic noise are assessed using human perceptions of sound level changes. Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, but a 10 dBA change is perceived as a doubling of noise levels. These guidelines permit estimation of an individual's probable perception of changes in noise levels.

Table 1

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<tr>
<th>Activity Category</th>
<th>Classification</th>
<th>A-weighted Decibels of Noise (dBA)</th>
<th>Description of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Background</td>
<td>57 [Continuous]</td>
<td>Lands in which forestry and agricultural activities occur and where the preservation of these activities is essential for the area to continue to produce its balanced economy</td>
</tr>
<tr>
<td>B</td>
<td>Roadside</td>
<td>62 [Continuous]</td>
<td>Freeways, major state roads, highways, major state and county parks, residences, schools, churches, hospitals, and hospitals</td>
</tr>
<tr>
<td>C</td>
<td>Residential</td>
<td>62 [Continuous]</td>
<td>Developed land, residences, or activities not included in Category A or B</td>
</tr>
<tr>
<td>D</td>
<td>Industrial</td>
<td>52 [Continuous]</td>
<td>Unregulated lands</td>
</tr>
<tr>
<td>E</td>
<td>Miscellaneous</td>
<td>52 [Continuous]</td>
<td>Factories, noise, public recreational areas, schools, churches, libraries, hospitals, and astronomical observatories</td>
</tr>
</tbody>
</table>

Notes:
1. "Continuous" implies the time duration of exposure energy is equal or level.
2. The interior noise of standards are similar to those used in other analyses, where no exterior or interior sensitive lands or activities have been identified.

Source: Federal Highway Administration
3.3 Noise Sensitive Receivers and Existing Noise Levels

Existing and future noise sensitive land uses, and activities adjacent to the proposed corridor and nearby main roadways, were identified from site inspections and existing mapping. These land use activities include residences, recreation and park areas, and institutions such as schools and churches. All of these activities have a NAC of 60 dBA and are considered Category B.

Existing noise levels at the project corridor were measured in March and April, 2004, from 08:00 p.m. to 06:00 p.m. Noise measurements were sampled for 15 minute periods at seven (7) sites considered representative of existing and future noise sensitive land uses (Table 2). One hour noise measurements were taken at sites A and B over a 24-hour period. Sites A and B were used to identify the peak noise hour and adjust the 15 minute samples to the peak noise level (Table 2). The 15 minute sample is adjusted to peak hour by comparing the measured 15 minute noise level to that of the observed 24 hour measurement site during the same hour. The difference between the peak hour measured at the 24 hour site and the 15 minute measurement is used to determine the peak hour noise level. The locations of these sites are shown in Figure 2.

The existing peak hour noise levels at all of the noise receptor sites were above 66 dBA (Table 2), and therefore do extend the Category B NAC. The noise levels at sites 1 and 2 are due to their close proximity to the H-1 Freeway and Palahana Road, which is heavily traveled by heavy trucks for hauling to and from the Waimea Pacific Quarry, located north of the H-1 freeway.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>LOCATION</th>
<th>Date and Time</th>
<th>Measured Noise Level (Leq)</th>
<th>Adjusted Peak Hour Noise Level (Leq)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H-1 Freeway and Palahana Rd. Future Commercial Developments</td>
<td>3/19 (10:30am)</td>
<td>68</td>
<td>72</td>
</tr>
<tr>
<td>2</td>
<td>Approximately 1000 feet west of H-1 Freeway and Palahana Rd. Near H-1 Freeway/ Palahana Rd. Commercial Development</td>
<td>3/26 (10:15pm)</td>
<td>60</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>Existing Kilauea/Waipahu Business District, Koolaupoko Park</td>
<td>3/29 (10:20pm)</td>
<td>64</td>
<td>74</td>
</tr>
<tr>
<td>4</td>
<td>Yamanawa Village, at front of Kamehameha Schools / Kamehameha Schools / Kamehameha Schools</td>
<td>3/11 (10:15am)</td>
<td>65</td>
<td>68</td>
</tr>
<tr>
<td>5</td>
<td>Yamanawa Village Residential Property, Kamehameha Schools / Kamehameha Schools / Kamehameha Schools</td>
<td>3/12 (10:15am)</td>
<td>66</td>
<td>69</td>
</tr>
<tr>
<td>6</td>
<td>Existing Car Rental Business, Kamehameha Schools / Kamehameha Schools / Kamehameha Schools</td>
<td>3/13 (10:15am)</td>
<td>60</td>
<td>64</td>
</tr>
<tr>
<td>7</td>
<td>Existing Car Rental Business, Kamehameha Schools / Kamehameha Schools / Kamehameha Schools</td>
<td>3/14 (10:15am)</td>
<td>61</td>
<td>64</td>
</tr>
</tbody>
</table>

24 hour monitoring

<table>
<thead>
<tr>
<th>Site No.</th>
<th>LOCATION</th>
<th>Date and Time</th>
<th>Measured Noise Level (Leq)</th>
<th>Adjusted Peak Hour Noise Level (Leq)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>H-1 Freeway and Palahana Rd. Future Agriculture Property, Future Recreational Area</td>
<td>3/19 (10:30am)</td>
<td>78</td>
<td>82</td>
</tr>
<tr>
<td>B</td>
<td>Yamanawa Village, Vacant lot north of Kamehameha Schools / Kamehameha Schools / Kamehameha Schools</td>
<td>4/27 (10:30pm)</td>
<td>74</td>
<td>78</td>
</tr>
</tbody>
</table>

Source: Project Bermou, June 2004
*Peak hour noise level is based on comparing the 15 minute measured level with the observed 24 hour monitoring level.
4. FUTURE TRAFFIC NOISE IMPACTS

The noise impact analysis of the proposed project considers traffic noise levels along North-South Road and Kapolei Parkway under all the above cases.

4.1 Prediction Methodology

4.1.1 Traffic Noise Projections for Proposed Roads

The noise impacts of the High and Low alternatives were modeled at nine (9) noise sensitive sites along the North-South Road and Kapolei Parkway alignments using the FHWA Traffic Noise Model (HNR) version 2.5 (FHWA, 2000). Impacts were calculated for the Year 2030.

Input variables to noise modeling and analysis include traffic volumes, speeds and vehicle fleet mix (buses, medium trucks and heavy trucks percentage). The noise analysis considers the highest hour of the day. This occurs when the traffic volume is at the capacity of the roadway, and vehicles operate at the allowable speed limit (Level of Service C). Table 3 summarizes the Level of Service (LOS) C traffic volumes. The traffic modeling assumptions, based on lane capacity operating at LOS C, are as follows:

**Table 3 LOS C Traffic Volumes**

<table>
<thead>
<tr>
<th>Roadway</th>
<th>LOS C Volume (vph)</th>
<th>Unweighted</th>
<th>Weighted</th>
<th>Predicted Speed Limit (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 Honolulu Hwy.</td>
<td>6,200</td>
<td>6,144</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>Farrington Hwy.</td>
<td>2,940</td>
<td>1,674</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Kapolei Pkwy.</td>
<td>1,931</td>
<td>1,580</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>North South Rd.</td>
<td>3,069</td>
<td>2,511</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

- Vehicle mix for the new roadways, Kapolei Parkway and North-South Road, is projected to be 50% percent autos, one percent medium trucks and one half percent heavy trucks.
- Vehicle mix for 11 Honolulu Hwy. and Farrington Hwy. is based on traffic counts taken during the noise measurements. 11 Honolulu Hwy. vehicle mix is 50 percent autos, 1 percent medium trucks and 6 percent heavy trucks. Farrington Hwy. vehicle mix is 60 percent autos, 2 percent medium trucks and 12 percent heavy trucks.

Legend

Noise Measurement Locations

Figure 2
4.2 Noise Impact Analysis

In terms of the one-hour $L_{eq}$ noise descriptor, a noise impact could potentially require mitigation if either of the following conditions is predicted to occur:

- Future year traffic noise approaches or exceeds the FHWA (MCA) or
- Future year traffic noise substantially exceeds (15 dBA or more) the existing annualized noise level

Table 4 summarizes the results of noise modeling of receptors along North South Road and Kapolei Parkway.

### Table 4: Predicted Year 2025 Noise Levels

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>Southern Highway Effect</th>
<th>Existing Peak Hour</th>
<th>LOS C Future Noise Levels ($L_{eq}$ (dBA))</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Hiwa H-1 and Hawaii Rd</td>
<td>Current Agricultural Property, Future Residential Area</td>
<td>69</td>
<td>69*</td>
</tr>
<tr>
<td>1</td>
<td>Hiwa H-1 and Palaoa Rd</td>
<td>Future Commercial Property</td>
<td>72</td>
<td>72*</td>
</tr>
<tr>
<td>2</td>
<td>Represented by 100% from Kailua Rd and Palama Rd</td>
<td>Northern Fwy and Kamehameha Hwy</td>
<td>72</td>
<td>72*</td>
</tr>
<tr>
<td>3</td>
<td>Hiwa H-1 intersection</td>
<td>North Shore Road and Kapolei Hwy</td>
<td>53</td>
<td>53*</td>
</tr>
<tr>
<td>4</td>
<td>Kaneohe Village</td>
<td>To field of Grove</td>
<td>64</td>
<td>64*</td>
</tr>
<tr>
<td>5</td>
<td>Kaneohe Village</td>
<td>To field of Grove</td>
<td>64</td>
<td>64*</td>
</tr>
<tr>
<td>6</td>
<td>Kaneohe Village</td>
<td>To field of Grove</td>
<td>64</td>
<td>64*</td>
</tr>
<tr>
<td>7</td>
<td>Kaneohe Village</td>
<td>To field of Grove</td>
<td>64</td>
<td>64*</td>
</tr>
</tbody>
</table>

Legend:
- *: The predicted noise levels are 6 dBA or less than the existing levels.
- #: The predicted noise levels are 6-10 dBA above the existing levels.

Source: Parsons Brinckerhoff, 2004

### 4.2.1 No-Build Alternative

Under the No-Build alternative, predicted 2025 traffic noise levels at the two project sites are expected to be in the range of no change to a 10 dBA increase over the existing peak hour noise levels. The KAC of $L_{eq}$ 67 dBA is predicted to be approached or exceeded at 5 of the 8 receptor sites.
4.2.2 Build Alternative

Under the Build alternative, predicted 2075 traffic noise levels at the receptor sites are expected to be in the range of no change to a 12 dBA increase over the existing peak
four noise levels. The HAC of L_{pm} 87 dBA is predicted to be approached or
exceeded at 5 of the 10 receptor sites.

4.3 Noise Contour Analysis

Sixty-six dBA noise contours, modeled for Build alternatives (Figures 3, 4 and 5), were
prepared as a guide for future residential development along the North-South Road
and Kopaniki Parkway alignments. Based on the HAC, the contours identify the distance
from the roadway centerline where future residential development would be acceptable
without noise abatement. The "substantially exceed the existing noise levels" criterion
is not applicable because it depends on existing noise level measurements which can
change in future years due to other sources of noise. The 66 dBA noise contour is a
useful planning tool for future development without requiring a detailed noise study.

The maximum setbacks, where residential development could potentially be located
without noise abatement, are listed in Table 5 as a range of distances from the roadway
centerline. These variances in distances are due to changes in topography. Noise
abatement measures may be required if noise sensitive activities are planned within
these setback distances.

Table 5
Recommended Minimum Highway Setbacks
for Residential Developments

<table>
<thead>
<tr>
<th>Build Alternative</th>
<th>345 feet</th>
<th>145 to 155 feet</th>
<th>95 to 100 feet</th>
<th>200 to 220 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study: Furman/Brown/Platt, 2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Any existing uses or future development beyond these distances would not require
noise abatement. However, if a future residential project is built within these setback
distances, it would be the responsibility of the developer to meet applicable standards.
At this time, there are no existing developments in the setback distances that require
noise abatement as part of the North-South Road and Kopaniki Parkway project.
5. CONSTRUCTION NOISE IMPACTS

Construction noise represents a short term impact on the noise environment. The duration and level of construction noise depend on the phase of activity, such as:

- ground clearing, demolition and removal of existing structures, trees, rocks and soil;
- excavation;
- placement of foundations and roadbeds;
- erection of structures including retaining walls; and
- landscaping, including tiling, grading, paving, landscaping and cleanup operations.

The first two phases, ground clearing and excavation, typically generate the highest noise levels. Noise generated by construction equipment, including trucks, graders, bolt extractors, concrete mixers and portable generators can result levels from 67 dBA to 98 dBA at 15 m (50 feet). Construction equipment noise emissions are regulated by the Environmental Protection Agency's Noise Control Program (Part 204 of Title 40, Code of Federal Regulations). Presently, air compressors are the only equipment under regulation, and no new regulations are currently under consideration.

Noise levels for equipment which might be used during the excavation and construction of the proposed project are presented in Table 6. The noise levels presented are at a reference distance of 15 m (50 feet). Since construction equipment noise levels decrease at a rate of approximately 6 dBA per doubling of distance, at 30 m (100 feet) the noise levels would be about 6 dBA less than the levels shown at 15 m (50 feet). Similarly, at 60 m (200 feet) the noise levels would be 12 dBA less than shown. Introducing structures or topography can act as a noise barrier to further reduce noise levels.

### Table 6

<table>
<thead>
<tr>
<th>Source</th>
<th>L10 at 15 m (50 feet)</th>
<th>Model Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backhoe</td>
<td>65 dBA</td>
<td>John Deere 60A</td>
</tr>
<tr>
<td>First Loader</td>
<td>64 dBA</td>
<td>Caterpillar 900</td>
</tr>
<tr>
<td>Digger</td>
<td>84 dBA</td>
<td>Caterpillar 708</td>
</tr>
<tr>
<td>Grabber</td>
<td>91 dBA</td>
<td>Caterpillar 16</td>
</tr>
<tr>
<td>Shovel</td>
<td>92 dBA</td>
<td>Caterpillar 600</td>
</tr>
<tr>
<td>Compactor</td>
<td>60-63 dBA</td>
<td>Various Tested</td>
</tr>
<tr>
<td>Pile Driver</td>
<td>95-100 dBA</td>
<td>Various Tested</td>
</tr>
</tbody>
</table>

Source: Federal Highway Administration, Urban Construction Noise Reduction, Division of Noise and Traffic, TPHC

6. Noise Abatement MEASURES

6.1 Future Traffic Noise

Noise abatement measures must be considered as part of the project if traffic noise impacts are identified. Impacts occur at sites where traffic noise levels exceed the noise standards or exceed the ambient noise levels. DOT's Noise Analysis and Abatement Policy is used to determine whether noise abatement measures can be implemented, depending on whether these measures are reasonable and feasible based on the following criteria:

- Provide a minimum noise reduction of 5 dBA;
- Cost of noise abatement does not exceed $25,000 per residence benefited;
- Number of residences impacted will not exceed a one-unit per dwelling unit - existing occupied houses, rental units, mobile homes, etc. only units benefiting by 5 dBA or more noise reduction will be counted in regisitration of whether or not they were identified as impacted;
- When loss of residences are a major consideration in the reasonable alternative of noise abatement measures;
- Residential areas where future traffic noise levels are greater than 70 dBA or 20 dBA higher than existing noise levels will be given greater consideration;
- Residential areas west highways at a new location and residential areas constructed before an existing highway will be given greater consideration.

Noise abatement would only be considered at existing residential or planned development sites where building permit approvals have been obtained. The abatement would only apply to outdoor ground level areas.

For the third alternative, noise impacts are not predicted, at any of the receptors analyzed. Therefore noise abatement is not required for this project. The predicted future traffic noise levels at these sites are above the NAC of 50 dBA. However, the noise level represents the measured existing or modeled noise levels at these locations. The traffic noise contribution from the proposed project does not exceed the existing or no build noise levels. As a result, abatement is not required at this location.
6.2 Construction Phase

Noise control measures during construction would be required to minimize impacts on existing noise sensitive land uses. The measures recommended in this section should be re-evaluated in greater detail during preliminary design because impacts to residents cannot be accurately determined without detailed construction plans and schedules. General abatement measures presented below are recommended as guidelines in developing construction plans that control the adverse impacts of construction noise.

1. Design Considerations - During the early stages of the construction plan development, natural and artificial barriers, such as ground elevation changes and existing buildings, can be considered shields against construction noise. Strategic placement of stationary equipment, such as compressors and generators, could reduce impacts at the sensitive receivers.

2. Construction of Noise Barriers During Initial Stages - Noise barriers planned to ultimately be constructed along the right-of-way for traffic noise abatement could be constructed during the initial stages to reduce the impacts of construction. Initial construction of noise barriers would significantly reduce construction noise impacts at the sensitive receivers.

3. Alternate Construction Methods - Certain phases of highway construction work, such as pile driving may produce noise levels in excess of acceptable limits, even when feasible noise reduction methods are used. These impacts may be reduced by using alternate methods of construction. In the case of pile driving, vibrational or hydraulic vibration could be used. Drilled holes for cast-in-place piles are another alternative that would produce significantly lower levels of noise.

4. Source Control - The contractor shall comply with SDDOT Standard Specifications and all local sound control and noise level suits, regulations, and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the job or related to the job shall be equipped with a muffler of a type recommended by the manufacturer. The internal combustion engine shall be operated on the job without a muffler.

5. Time and Activity Control - Noise activities involving large machinery could be limited to daytime hours when most people normally impacted are either not present or engaged in less noise sensitive activities. Nighttime construction would require a variance. Compliance with local Noise Ordinances will mitigate impacts associated with construction noise. To comply with the ordinance, all construction activities adjacent to residential zones will be limited to daytime hours (7:00 a.m. to 7:00 p.m.) on Monday through Saturdays.

The measures above can be incorporated into the specific construction plans to minimize noise impacts to sensitive receivers along the project corridor. Noise emission limits could be developed. Construction hours could be set, and noise level limit could be determined and adhered to during construction.
7. REFERENCES


United States Department of the Interior
FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOSYSTEM
501 ALA MOANA BOULEVARD, ROOM 1100
HONOLULU, HI 96814
PHONE (808) 586-8244 FAX (808) 586-8269

Jan Reichelderfer, Environmental Planner
Parson Brinckerhoff Quade & Douglas, Inc.
Pacific Tower, Suite 3000
1691 Bishop St.
Honolulu, HI 96813

Dear Ms. Reichelderfer:

On December 12, 1995, the U.S. Fish and Wildlife Service (Service) received your December 6, 1995 letter requesting identification of the proposed and listed threatened and endangered species in the vicinity of the proposed corridor for the North-South Road Project. We regret that our reply was delayed due to an error.

The Service has reviewed the map provided with your request and pertinent information in our files, including maps prepared by the Hawaii Heritage Program of the Nature Conservancy. Although the proposed project area has been extensively modified by agritourism and development activities, there are historical records of the following Federal Trust Species in the vicinity of the proposed corridor:

Plants
Cassia cunninghamii (Listed Endangered)
Adromischus villanu (Listed Endangered)

There are also historical records of Species of Concern (formerly known as Candidate 2 Species). While these species are not currently federally protected, they may be added to the Endangered Species List in the future. Species of Concern historically in the vicinity of the project area include two species of plants, Portulaca villosa and Zauschneria aestivalis, and one insect, Pseudememerus abnormis.

We appreciate your concern for endangered species and would like the opportunity to review the Draft Environmental Assessment for this project. If you have any questions, please contact our Branch Chief for Intergovernmental Cooperation, Ms. Maria Sole, at Fish and Wildlife Biologist Yacyn Kubina at 688-541-3441 (fax: 688-541-2470).

Sincerely,

Brook Harper
Field Supervisor
Ecological Services

In Reply To: TR

Jaun Reichelderfer, Environmental Planner
Parson Brinckerhoff Quade & Douglas, Inc.
Pacific Tower, Suite 3000
1691 Bishop St.
Honolulu, HI 96813

Dear Ms. Reichelderfer:

This letter is in response to your phone call on June 10, 1996, requesting further information on a site known as Penstemon abitomi (formerly Penstemon abitomi). In our letter dated February 1, 1996, the U.S. Fish and Wildlife Service (Service) noted that historical records of this species were known from the vicinity of the proposed corridor for the North-South Road Project. Our letter (dated this species as a Species of Concern (formerly known as a Candidate 2) to the Service.

We would like to take this opportunity to clarify our policy on Species of Concern. The term "Species of Concern" describes species that are of concern to the Service, but require further biological research and field study to resolve their conservation status. These species are not currently federally protected, and the Service is no longer officially maintaining a list of these species.

While some species considered Species of Concern may be quite rare, the Service believes that Penstemon abitomi is more common than previously believed and may not be native to the Hawaiian Islands. Consequently, the Service is not reviewing the status of this species for possible listing. There is no need to survey the project area for this issue as part of the environmental review process.

We appreciate your concern for endangered species. If you have any further questions, please contact our Branch Chief, Mr. Mauro Stahl, at Fish and Wildlife Biologist Tanya Schindel at 688-541-2470 (fax: 688-541-2470).

Sincerely,

Brook Harper
Field Supervisor
Ecological Services
December 8, 1995

Michael Buck
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl
Honolulu, HI 96813

Subject: North-South Road Project

Dear Mr. Buck:

Parsons Brinckerhoff has been selected as the engineering and environmental consultant for the North-South Road Project and we ask your assistance in our environmental assessment.

We request that the Division of Forestry and Wildlife identify the listed and proposed to be listed threatened and endangered species in the vicinity of the proposed corridor. A location map showing the project area is attached for your use.

Please do not hesitate to call me at 566-2271 if you have any questions or need more information.

Yours sincerely,

Parsons Brinckerhoff Quade & Douglas, Inc.

Jon Reichelderfer
Environmental Planner

Attachment: North-South Road Corridor Location Map

cc: Gregory Hae, DTS
Faith Miyamoto, DTS

Over a Century of Engineering Excellence

December 8, 1995

Brooks Harper, Field Supervisor
Ecology Services
Fish & Wildlife Service
P.O. Box 50167
Honolulu, HI 96850

Subject: North-South Road Project

Dear Mr. Harper:

Parsons Brinckerhoff has been selected as the engineering and environmental consultant for the North-South Road Project and we ask your assistance in our environmental assessment.

We request that the Fish and Wildlife Service identify the listed and proposed to be listed threatened and endangered species in the vicinity of the proposed corridor. A location map showing the project area is attached for your use.

Please do not hesitate to call me at 566-2271 if you have any questions or need more information.

Yours sincerely,

Parsons Brinckerhoff Quade & Douglas, Inc.

Jon Reichelderfer
Environmental Planner

Attachment: North-South Road Corridor Location Map

cc: Gregory Hae, DTS
Faith Miyamoto, DTS

Over a Century of Engineering Excellence
3. IMPACT ASSESSMENT

The biological assessments prepared for the housing developments in the study area did not anticipate significant impacts to animals because most of the animals in the area are widespread, and they easily adapt to urban environments.

The impacts of the proposed North-South Road in terms of habitat disturbance would be similar to the impacts of the housing developments. Although the number of road kills may increase, the animals present in the area, such as cats, mongooses, and mice, will readily adapt to the new roadway. The road occupies a narrow band of land, and abundant habitat for those animals will remain. Because these animals have occupied habitat near urban development, construction activities should not have a major negative effect on their daily habits. There are no wildlife or waterfowl refuges which could potentially contain sensitive animals in the project vicinity.

The project area also appears not to contain any threatened or endangered animals. Therefore, based on correspondence with the Service and documents from other projects in the vicinity, construction of North-South Road would not jeopardize any federally or state protected fauna.

4. REFERENCES


North-South Road Corridor Study Zoological Technical Report

The Service responded on February 1, 1995 (see Appendix A) with information about one species, Pteranthus dubius, a type of snail, that has historically been found in the vicinity of the project area. However, as explained in the Service's June 12, 1995, letter (see Appendix A), Pteranthus dubius is listed as a "Species of Concern." While some Species of Concern are rare, the Service states that this species is more common than previously believed and may not even be native to the Hawaiian Islands. The Service is not reviewing the status of the object for potential federal protection. The Service recommends that no surveys for this species be performed in the project area during the environmental review process for North-South Road.

DLNR stated that they have not done any specific studies on threatened or endangered species in the area.

Table 1
Animals Seen During Recent Zoological Surveys in the Project Vicinity

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manuas</td>
<td>Rattus exulans</td>
</tr>
<tr>
<td>House Mouse</td>
<td>Mus musculus</td>
</tr>
<tr>
<td>Feral Dog</td>
<td>Canis familiaris</td>
</tr>
<tr>
<td>Feral Cat</td>
<td>Felis catus</td>
</tr>
<tr>
<td>Mongrel</td>
<td>Canis familiaris</td>
</tr>
<tr>
<td>Auahi</td>
<td>Paroaria gouldii</td>
</tr>
<tr>
<td>Blackbird</td>
<td>Plectropterus gouldii</td>
</tr>
<tr>
<td>Wampwi</td>
<td>Metallurus frenatus</td>
</tr>
<tr>
<td>Nene</td>
<td>Branta sandvicensis</td>
</tr>
<tr>
<td>Cattle</td>
<td>Bos taurus</td>
</tr>
<tr>
<td>House Finch</td>
<td>Lonchura oryzivora</td>
</tr>
<tr>
<td>Lizard</td>
<td>Urosaurus johnstoni</td>
</tr>
<tr>
<td>Snake</td>
<td>Boiga irregularis</td>
</tr>
<tr>
<td>Beetle</td>
<td>Diploptera</td>
</tr>
<tr>
<td>Bird</td>
<td>Hypsipetes</td>
</tr>
<tr>
<td>Songbird</td>
<td>Zosterops</td>
</tr>
<tr>
<td>Goose</td>
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<tr>
<td>Duck</td>
<td>Anas poecilorhyncha</td>
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<tr>
<td>Swan</td>
<td>Cygnus cygnus</td>
</tr>
<tr>
<td>Lighthouse</td>
<td>Otis brucei</td>
</tr>
<tr>
<td>Birds</td>
<td>Zosterops</td>
</tr>
</tbody>
</table>

North-South Road Corridor Study  Zoological Technical Report

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1. INTRODUCTION

1.1 Proposed Action
The Federal Highway Administration (FHWA) and the Highways Division of the State of Hawaii Department of Transportation (EDOT) are proposing to construct North-South Road, a divided major arterial, in Ewa, Oahu, Hawaii (see Figure 1). The roadway would connect the H-1 Freeway with a future segment of Kapolei Parkway, a distance of approximately 3.6 km (2.2 miles). The proposed project also includes a North-South Road interchange with the H-1 Freeway.

1.2 Purpose of Report
This zoological assessment investigated the impact of the proposed North-South Road on the existing faunal community in the study area. The report relies on several recent biological assessments prepared for environmental documents of housing developments in the study area (Ikei developer, Ewa Beach Plan Environmental Impact Statement (EIS), 1996; Iki developer, Ewa Beach Plan Environmental Impact Statement (EIS), 1996; and Kaneohe developer, Kaneohe Plan Environmental Impact Statement (EIS), 1998). Based on field observations, the habitats that would be crossed by the proposed North-South Road are the same as and adjacent to the habitats that were surveyed for these biological assessments. Therefore, given the proximity and similarity to the areas that were already surveyed, the recent evaluation of these other biological assessments, and the findings of relatively common animals adapted to urban conditions, no faunal field surveys were conducted for this project.

2. EXISTING CONDITIONS

2.1 Previous Studies
Several recent biological assessments prepared for housing developments uniformly concluded that the faunal communities in the study area were typical of abandoned upcountry lots near urban areas on Oahu. Common animals include mice, mongooses, rats, a variety of birds, and feral cats and dogs (see Table 1). The studies concluded that the study area was extensively modified from its original state and has little value as native bird habitat. None of these studies reported evidence of threatened or endangered species.

2.2 Agency Consultation
Letters were sent to the U.S. Fish and Wildlife Service (Service) and the State of Hawaii Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife, to gather information about the possible presence of threatened or endangered species (see Appendix).
ZOOLOGICAL TECHNICAL REPORT

September 1997
APPENDIX H

BOTANICAL SURVEY REPORTS

This appendix includes: the November 1996 Botanical Survey Report; the March 2004 Botanical Resources Assessment Study for Kapolei Parkway; and the Habitat Conservation Plan.
November 1996 Botanical Survey Report for North-South Road
NORTH-SOUTH ROAD CORRIDOR STUDY
PHASE 1
'Ewa, O'ahu, Hawai'i
Project No. HWY-0-01-92

BOTANICAL SURVEY
TECHNICAL REPORT

Prepared for:
City and County of Honolulu
Department of Transportation Services
Pacific Park Plaza
711 Kalakaua Boulevard, Suite 1200
Honolulu, Hawai'i 96813

Submitted by:
Parsons Brinckerhoff Quade & Douglas, Inc.
Pacific Tower, Suite 1200
1651 Bishop Street
Honolulu, Hawai'i 96813

November 1996

FBID Reference: NE15A - Product 8-6
BOTANICAL SURVEY
NORTH-SOUTH ROAD CORRIDOR STUDY
'EKA DISTRICT, ISLAND OF O'AHU

by

Winona P. Char
CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: PARSONS BRINCKERHOFF
GAGE AND DOUGLAS, INC.

INTRODUCTION

A botanical survey of the North-South corridor from its proposed interchange with Interstate Route H-1 to its maile terminus at the proposed 'Ewa Flats development was conducted on 17 June 1996. The majority of the alignment will cross through sugar cane fields which no longer are in cultivation. Although cane cultivation ceased approximately one to two years ago, many fields, especially those located between Farrington Highway and Waimanalo Road, still support large areas covered by cane. Smaller sections along the alignment support koa halele scrub or a mixed scrub composed of various grasses and weedy herbs and shrubs. The proposed corridor follows along Kapolei Parkway for a portion of its length; the parkway, which crosses through a residential area, is landscaped and maintained.

The reconnaissance field work focused on the undeveloped portions of the corridor as sensitive native plant communities were more likely to occur in these areas. The primary objectives of the field studies were to: 1) describe the vegetation found on the undeveloped portions of the corridor; 2) inventory the flora; 3) search for threatened and endangered species as well as rare and vulnerable plants; and 4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.
SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. The roadway alignment maps were examined to determine terrain characteristics, access, boundaries, and reference points.

A walk-through survey method was used. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium (University of Hawaii, Manoa -- RHA). All plants were identified to the specific level prior to the preparation of this report, except for A Dihetera species -- an introduced crabgrass. Notes were made on plants distributions and associations, substrate types, drainage, disturbances, topography, exposure, etc.

The species recorded within the corridor study area are indicative of the season ("rainy" vs. "dry") and environmental conditions at the time of the survey. This survey was conducted on 17 June 1996 during the dry summer months. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual taxa.

DESCRIPTION OF THE VEGETATION

In the U.S. Fish and Wildlife Service sponsored "Ewa Plains" Botanical Survey (Char and Balakrishnan 1979), the vegetation along the majority of the roadway corridor was mapped as "C", sugar cane fields. On areas which were not actively cultivated, koa haole shrubland and mixed grass-shrubland occurred. Since that survey, much of the "Ewa Plains" has been developed for the second city of Kapolei and the O'ahu Sugar Company, Ltd., has ceased cultivating the cane fields.

Because the "Ewa Plains have been extensively disturbed by agricultural activities for such a long period of time, there are few areas which support native plant communities. The few places with native plants are restricted to sites with karst or limestone topography; since these areas do not have soil they were unsuitable for agriculture. Two listed endangered species which occur today in such habitats are the "Ewa Plains" 'okole (Chenopodium skottsbergii) and Ambrosia splendens var. exotomoides. Both are found only on limestone sites within Canebell Industrial Park and Ewa Air Station Barber's Point (Char and Balakrishnan 1979; Traverse Group, Inc., 1988). There are historical records of two listed endangered species, the 'auwai (Centaurium reticulatum) and 'hi'ihi (Helianthus villanese), and two species of concern (formerly candidate 2 species), the 'hi'i (Diascia villanese) and pu'o'uma (Keruimura scirpioides), in the vicinity of the proposed corridor (B. Harper, USFWS, 01 Feb. 1996 letter).

Along the proposed North-South Road corridor, there are no areas with karst topography or remnant native plant communities or threatened and endangered species. The corridor, for the most part, crosses former sugar cane fields or weedy, overgrown scrub vegetation.

In the discussion below, the vegetation along the corridor is described from makena to naikai, that is, from the proposed interchange with Interstates Routes H-1 to its naikai terminus at the 'Ewa Marina development. Locations are referenced to existing roads and other landmarks. A checklist of all those plants inventoried during the field studies is presented at the end of the report.

Vegetation along the corridor

At the interchange with H-1, dense koa haole shrubs (Laurea
leucocephala) border the highway and cover the southeast portion of the interchange. Clumps of Guine grass (Panicum maximum), 3 to 5 ft. tall, form a thick cover between the shrubs. Scattered through this koa haole/Guine grass scrub are trees of kiawe (Fremisia pallida) and 'optuna (Pithecellobium dulce). Along Kalo'i Gulch, there are a few Java plum (Syzygium samarangense) and koa haole shrubs (Allophane ciliata) trees among the koa haole thickets. Upland of the highway are former sugar cane fields now overgrown with Guine grass and buffel grass (Cenchrus ciliaris).

Between Interstate Route H-1 and Farrington Highway, the former sugar cane fields are now densely overgrown with buffel grass. A few clumps of the taller Guine grass can be found scattered here and there. Koa haole shrubs and a few kiawe trees line the edges of the grassy fields.

On State lands between Farrington Highway and Waimanalo Road, the cane fields were most recently abandoned and so there are still large areas covered by sugar cane plants (Saccharum officinarum), from 5 to 7 ft. tall. Where the plants collect runoff water, cane cover is high, about 80%. Where the soil is drier and cracked, many dried out clumps of cane remain, with the cover of live plants about 10 to 25%. These fields are being invaded by swollen fingergrass (Chloris barbata) and a number of other weedy species which include 'uluaoa (Calotis indica), cow button (Tridax procumbens), Guine grass, Johnson grass (Sorgum halepense), lion's ear (Oenothera missouriensis), pink bindweed (Ipomoea triloba), castor bean (Euphorion crenata), 'ilima (Sida fallax), etc.

Where the alignment follows between Varona Village and Tenny Village and then alongside the O'ahu Railway tracks and right-of-way, the vegetation is composed of disturbed, woody scrub. Guine grass, castor bean, and swollen fingergrass are abundant. Other components of this weedy assemblage include bristle fennel (Ruatia verticillata), coarse grass (Eleusine indica), Bermuda grass or manicume (Cynodon dactylon), abrantias aspera, koa haole, and wild lettuce (Lactuca serriola). Near the old sugar mill, there are overgrown piles of soil, scrap lumber, concrete pipe sections, etc.

After the sugar mill, the alignment follows along Kapekai Parkway and most of the land is landscaped, or maintained to some degree (Kalo'i drainage channel). Homes or hoko under construction border the parkway for most of its length.

From Geiger Road to its terminus at the 'Pan Makaha boundary, the vegetation consists of disturbed, weedy scrub vegetation along the northern portion of the corridor where construction is taking place. The remaining lands along the corridor are former cane fields which have been leveled and are now used to graze horses and beef cattle. The vegetation is heavily grazed and consists primarily of swollen fingergrass and weedy species. Patches of Guine grass, buffel grass, and green panicle grass (Panicum maximum var. crinum) are scattered here and there. Locally abundant in places are prickly patches of spiny anther (Anarthron spinosum), golden crownbeard (Veronica americana), and saltbush (Atriplex suberecta). Among the woody components are a few shrubs of pluca or sourbush (Pluca styphylfolia), Indian pluca (Pluca indica), koa haole and young trees of kiawe and 'optuna, 3 to 6 ft. tall.

DISCUSSION AND RECOMMENDATIONS

The proposed North-South Road corridor will cross primarily through former sugar cane lands now overgrown with weedy plants, koa haole scrub, and mixed scrub. All of the lands within the corridor have been disturbed at some time, and the vegetation is...
composed almost exclusively of introduced or alien species. Introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's discovery of the islands in 1778. Large scale sugar cultivation removed almost all native cover and fields of sugar replaced vast tracts of forest and shrubland. In fact, erosion was actually promoted on the slopes above the 'Ewa sugar plantation. Vertical plowing and drainage ditches encouraged erosion from the lower Wai'anae slopes and soil deposition on the lower plains (Guddihy and Stone 1990).

Of a total of 72 species inventoried within the corridor, 68 (95%) are introduced plants, 1 (1%) is originally of Polynesian introduction, and 3 (4%) are native. The three native species -- 'ilima (Sida fallax), po'opo (Solanum andraecio), and 'ahalea (Calithova indica), are all indigenous or presumably indigenous species. These are plants which are native (occur naturally) in the Hawaiian Islands and also throughout the Pacific and/or tropics. None of the plants is a listed, proposed, or candidate threatened and endangered species (U.S. Fish and Wildlife Service 1991, 1994a, 1994b, 1996); nor is any plant a species of concern or rare and vulnerable (Hogker et al. 1990).

There have been a number of botanical studies for recent residential developments, golf courses, and other projects on the 'Ewa Plains, some of then conducted by the principal investigator (Char 1980, 1988, 1989, 1991). All have recorded findings similar to those above.

Given the findings above, the following conclusions can be made:
- The proposed North-South Road corridor project is not expected to have a significant negative impact on the botanical resources within the corridor; nor is it expected to have a significant cumulative impact on the flora of the general 'Ewa region. There are no threatened and endangered species or sensitive native plant-dominated communities within the corridor.
- No wetland or wetland vegetation occur within the proposed corridor.
- Botanically, there is little of interest or concern on the project site.

Recommendations: Act 73 which was passed by the 1991 Hawai'i State Legislature, mandates that any new or renovated landscapes for any project developed with State funds incorporate native Hawaiian plants wherever and whenever possible.

It is recommended that some of the more easily grown native species be used to landscape portions of the road such as the interchange. Native species which are already adapted to the local environmental conditions would require less water. Some plants suitable for this area include trees such as 'aalii (Krythina sandwicensis) and 'alala (Psindus ehehensis); and shrubs such as 'alo'alo (Triphora sandwicensis), 'alalii (Pedodorea viscosa), 'ala (Eleocharis wagneri), and 'ulu (Piperia ciliata). Other examples of native plants which can be used for landscaping are found on display at the xeriscape garden at the Halawa Board of Water Supply.
PLANT SPECIES LIST -- North-South Road Corridor Study

The following checklist is an inventory of the plant species observed on the undeveloped lands within the proposed roadway corridor. The flowering plants are arranged alphabetically by families within each of two groups: Monocots and Dicots. The taxonomy and nomenclature of the flowering plants follow the most recent treatment of the Hawaiian flora by Wagner et al. (1990).

For each species, the following information is provided:
1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:
   I = indigenous = native to the Hawaiian Islands and also elsewhere throughout the Pacific and/or tropics.
   ? = questionably indigenous = data not clear if introduced or if arrived here by natural means, but weight of evidence suggests probably indigenous.
   P = Polynesian = plants originally of Polynesian introduction prior to Western contact (Cook's discovery of the islands in 1778).
   X = introduced or alien = all those plants brought to the islands by humans, intentionally or accidentally, after Western contact.

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Common name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MONOCOTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commelinaceae (Dayflower Family)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commelina benghalensis L.</td>
<td>hairy honebena</td>
<td>X</td>
</tr>
<tr>
<td>Cyperaceae (Sedge Family)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyperus rotundus L.</td>
<td>nut sedge, nutgrass</td>
<td>X</td>
</tr>
<tr>
<td>Poaceae (Grass Family)</td>
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<td></td>
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<tr>
<td>Brachiaria mutica (Pavon.) Stapf</td>
<td>California grass</td>
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</tr>
<tr>
<td>Cenchrus ciliaris L.</td>
<td>buffel grass</td>
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</tr>
<tr>
<td>Cenchrus echinatus L.</td>
<td>sandbur</td>
<td>X</td>
</tr>
<tr>
<td>Chloris barbata (L.) Sw.</td>
<td>slender fingergrass, nonolei</td>
<td>X</td>
</tr>
<tr>
<td>Chloris radiata (L.) Su.</td>
<td>plush grass</td>
<td>X</td>
</tr>
<tr>
<td>Cyndon dactylon (L.) Pers.</td>
<td>beerreeda grass, manono</td>
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</tr>
<tr>
<td>Dactyloloxeum sphenocodium (L.) Willd.</td>
<td>beach wiregrass</td>
<td>X</td>
</tr>
<tr>
<td>Digitaria insularis (L.) Hitch. ex Elymus</td>
<td>sour grass</td>
<td>X</td>
</tr>
<tr>
<td>Digitaria sp.</td>
<td>crabgrass</td>
<td>X</td>
</tr>
<tr>
<td>Eleusine indica G. Don.</td>
<td>goose grass, wire grass</td>
<td>X</td>
</tr>
<tr>
<td>Lepischina minervia (Pavon.) Hitch. &amp; Chase</td>
<td>lepchohao</td>
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</tr>
<tr>
<td>Panicum maximum Jacq.</td>
<td>Guine grass</td>
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</tr>
<tr>
<td>Panicum maximum var. trichoglume</td>
<td>green panicgrass</td>
<td>X</td>
</tr>
<tr>
<td>Scleria ex Paronya</td>
<td>sugar cane, ko</td>
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</tr>
<tr>
<td>Saccharum officinarum L.</td>
<td>brackily foxtail</td>
<td>X</td>
</tr>
<tr>
<td>Sesuvium portulacastrum (L.) Poir</td>
<td>Johnson grass</td>
<td>X</td>
</tr>
<tr>
<td><strong>DICOTS</strong></td>
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<td></td>
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<tr>
<td>Acanthaceae (Acantbus Family)</td>
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<tr>
<td>Acanthus angustifolia (L.) T. Anders.</td>
<td>Chinese violet</td>
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<td>Aristolochiaceae (Aristolochus Family)</td>
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<tr>
<td>Aristolochia azurea L.</td>
<td>huki weed</td>
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<tr>
<td>Aristolochia nummularia Kunth</td>
<td>spiny amaranth, pokai</td>
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</tr>
<tr>
<td>Aristolochia spinosa L.</td>
<td>kuku</td>
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</tr>
<tr>
<td>Aristolochia viridissima L.</td>
<td>slender amaranth, pokai</td>
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<tr>
<td>Avicenniaceae (Nonga Family)</td>
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<tr>
<td>Avicennia hirsuta (L.) Radl.</td>
<td>Christmas berry</td>
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</tr>
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<td>Scientific name</td>
<td>Common name</td>
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<td>APIACEAE (Cerat Family)</td>
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<tr>
<td>Ciclospermum leptophyllum (Pers.) Sprague</td>
<td>fir-leaved celery</td>
<td>X</td>
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<tr>
<td>ASTERACEAE (Daisy Family)</td>
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<tr>
<td>Bidens pilosa L.</td>
<td>Spanish needle, beggars tick, ki</td>
<td>X</td>
</tr>
<tr>
<td>Conyza bonariensis (L.) Cronq.</td>
<td>hairy horsemint, 'tilieba</td>
<td>X</td>
</tr>
<tr>
<td>Erilia fosbergii N. H. Groth</td>
<td>Floris' paintbrush, red pus-tele</td>
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</tr>
<tr>
<td>Flaveria trinervia (Sprm.) C. Neef</td>
<td>flaveria</td>
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<tr>
<td>Lactuca serriola L.</td>
<td>prickly lettuce</td>
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</tr>
<tr>
<td>Pluchea indicus (L.) Less.</td>
<td>Indian pluchea</td>
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</tr>
<tr>
<td>Pluchea symphytoides (Miller) Gillis</td>
<td>pluchea, sourbush common southbush, pus-tele</td>
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<tr>
<td>Sonchus oleraceus L.</td>
<td>coat buttons</td>
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</tr>
<tr>
<td>Tridax procumbens L.</td>
<td>golden crownhead</td>
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</tr>
<tr>
<td>Vescetina enceloloides (Cav.) Bentch. &amp; Hook.</td>
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<td>BORAGINACEAE (Borage Family)</td>
<td>heliotrope</td>
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<td>Heliotropium procumbens var. depressum (Cham.) Fosb.</td>
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<tr>
<td>CHEronsEOIDACEAE (Goosefoot Family)</td>
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<tr>
<td>Atriplex suberecta Verd.</td>
<td>'sheahea</td>
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<tr>
<td>Chenopodium murale L.</td>
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<tr>
<td>CUCURBITACEAE (Cucurbit Family)</td>
<td>field bindweed</td>
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<td>Ipomoea obscura (L.) Kar.-Garc.</td>
<td>pink bindweed, little ball</td>
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</tr>
<tr>
<td>Ipomoea triloba L.</td>
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<td></td>
</tr>
<tr>
<td>CYCNOJACUNCEAE (Gourd Family)</td>
<td>ivy gourd, scarlet-fruited gourd</td>
<td>X</td>
</tr>
<tr>
<td>Cocculus grandis (L.) Voigt</td>
<td>hedgehog gourd, wild cucumber</td>
<td>X</td>
</tr>
<tr>
<td>Curcurbita chrysanthia L.</td>
<td>wild bittermelon</td>
<td>X</td>
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<tr>
<td>EUPhorbiaceae (Spurge Family)</td>
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<tr>
<td>Allenia melocarca (L.) Mill.</td>
<td>kuki, kuki</td>
<td>P</td>
</tr>
<tr>
<td>Chamaesyce hirta (L.) Millip</td>
<td>hairy spurge</td>
<td>X</td>
</tr>
<tr>
<td>Chamaesyce hypericifolia (L.) Millip.</td>
<td>graceful spurge</td>
<td>X</td>
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</table>

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<th>Scientific name</th>
<th>Common name</th>
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<td>Chenopodium prostratum (Alt.) Scuell</td>
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</tr>
<tr>
<td>Euphorbia cyathophora J.A. Murray</td>
<td>Mexican fire plant, wild polnetietia</td>
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</tr>
<tr>
<td>Phyllanthus debilis Klein ex Willd.</td>
<td>miruri</td>
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</tr>
<tr>
<td>Ricinus communis L.</td>
<td>castor bean, pa'sila, kuli</td>
<td>X</td>
</tr>
<tr>
<td>PARAGACEAE (Pea Family)</td>
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<tr>
<td>Crotalaria incana L.</td>
<td>fuzzy ratlepod, kuka-beho</td>
<td>X</td>
</tr>
<tr>
<td>Crotalaria pallida Atiin</td>
<td>smooth ratlepod, pika-kot</td>
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</tr>
<tr>
<td>Desmanthes villosa (L.) Willd.</td>
<td>slender mimosa</td>
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<tr>
<td>Indigofera spicata Forsk.</td>
<td>creeping indigo</td>
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</tr>
<tr>
<td>Indigofera suffruticosa Hill.</td>
<td>hoa hanle</td>
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</tr>
<tr>
<td>Leucaena leucocephala (Lam.) de Vlts.</td>
<td>wild bean, eew pea</td>
<td>X</td>
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<tr>
<td>Macroptilium latifolium (L.) Urb.</td>
<td>'opipuma</td>
<td>X</td>
</tr>
<tr>
<td>Paspalum pallidum (Humb. &amp; Bonpl. ex Willd.) Kuntze</td>
<td>kluhe</td>
<td>X</td>
</tr>
<tr>
<td>Sesamum indicum (Humb. &amp; Bonpl. ex Willd.) R. Irwin &amp; Barneby</td>
<td>senna</td>
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</tr>
<tr>
<td>LAMIACEAE (Mint Family)</td>
<td>lion's ear</td>
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</tr>
<tr>
<td>Leonora nepitifolia (L.) R. Br.</td>
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</tr>
<tr>
<td>SALVACEAE (Hallow Family)</td>
<td>hairy abution, na'o</td>
<td>X</td>
</tr>
<tr>
<td>Abutilon grandifolium (Willd.) Sweet</td>
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<td>X</td>
</tr>
<tr>
<td>Hybanthus coronandifolium (L.) Garcke</td>
<td>false mallow</td>
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<td>Sida fallax Wulp.</td>
<td>'ilina</td>
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<td>Sida rhomboidea L.</td>
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<tr>
<td>HYRACEAE (Hyrtle Family)</td>
<td>Java plum</td>
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<td>Syzygium cumini (L.) Skeels</td>
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<tr>
<td>HYSTACACEAE (Four-o'clock Family)</td>
<td>red-flowered beerhavia</td>
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<tr>
<td>Boerhaavia coccinea Hill.</td>
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<td>X</td>
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<tr>
<td>PASSIFLOREACEAE (Passion Flower Family)</td>
<td>running pop, pahpepe</td>
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<tr>
<td>Passiflora foetida L.</td>
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<tr>
<td>SOLANACEAE (Nightshade Family)</td>
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<tr>
<td>Lycopus americanus linnaeanus (Juel.) Hill.</td>
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<td>X</td>
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<tr>
<td>Nicotiana glauca R.C. Graham</td>
<td>currant toto, paka</td>
<td>X</td>
</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>
Scientific name  
Solanum americanum Hill.

Common name  
glossy nightshade, popolo, 'aloha

Status  

LITERATURE CITED


March 2004 Botanical Resources Assessment Study
for Kapolei Parkway
BOTANICAL RESOURCES ASSESSMENT STUDY
KAPOLEI PARKWAY EXTENSION FROM NORTH-SOUTH ROAD TO ORAL, RIGHT-OF-WAY
KAPOLEI, O'AHU

INTRODUCTION

The proposed Kapolei Parkway Extension will connect the proposed North-South Road with the ORAL, right-of-way (ROW) where the existing Kapolei Parkway currently ends. A botanical survey for this extension of the Kapolei Parkway was conducted in two sections (Figure 1).

The first section of Kapolei Parkway is from the proposed intersection with North-South Road to the proposed intersection with Renton Road. The botanical survey area for this section consists of approximately 60 acres of City and County-owned lands located between Wai'anae Village and Kau'ula Gulch/WaiauVIllages Golf Course (Figure 2). For the most part, the proposed parkway follows along or close to an existing paved road which accesses the golf course maintenance facility. In other places, it crosses the hala/buffalo grass scrub vegetation. The endangered *Abutilon xerophytum*, common names for that lake and red fime, is known to occur on the adjacent State-owned lands; some Abutilon have been observed on the City and County-owned lands (Hashi and PBIR Hawaii 2003).

The second section of Kapolei Parkway is from the proposed intersection with Renton Road to the ORAL, right-of-way (ROW). The botanical survey area for this section is an approximately 20-acre area bounded by Renton Road to the west, the existing Ewa Mahake Park to the north, the Ewa Gentry subdivision and a portion of the ORAL, ROW to the east, and Kau'ula Gulch and the ORAL, ROW to the south (Figure 3). This property is also owned by the City and County of Honolulu. The proposed parkway follows along an existing paved concrete road. Except for Kau'ula Gulch, most of the site appears to have been graded in the past.

Field studies to assess the botanical resources on the 80-acre study site including the proposed Kapolei Parkway corridor from North-South Road to Renton Road were conducted on 9 January 2004 by a team of two botanists. The Renton Road to ORAL, ROW section was surveyed on 2 February 2004. The primary objectives of the field survey was:

1. prepare a general description of the vegetation on the study sites; and
2. search for *Abutilon xerophytum* as well as other threatened and endangered species and species of concern.

SURVEY METHODS

For the North-South Road to Renton Road section of Kapolei Parkway, a colored aerial photograph (nominal 1" = 250') was used, while the design and construction plans were used for the Renton Road to ORAL, ROW section. These were examined prior to the field studies to familiarize the botanists with vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

The proposed parkway corridor on the 80-acre site was flagged and staked by the survey engineers before our field survey. Thirty (30) fixed site transects were made through the koa hala/buffalo grass scrub found between the existing paved road and the edge of the golf course. This is identified as "Area E" on Figure 1. Plots of *Abutilon* are known from this portion of the study site. Lease intensive transects were conducted for the more recently disturbed area near the existing paved road; this is identified as "Waiau Village Extension" on Figure 1.

The survey for the proposed parkway corridor on the 120-acre site between Renton Road to ORAL, ROW focused on the less disturbed Kau'ula Gulch area. Notes were made on plant associations and distribution, disturbances, substrate types, topography, exposure, drainage, etc.

DESCRIPTION OF THE VEGETATION

The plant names used in this report follow Wagner et al. (1990) and Wagner and Hultet (1999). The few recent name changes are those reported in the Hawaii Biological Survey notes (Fuentes and Eldridge, eds., 1999-2003). The vegetation is described on each of the two areas within the 180-acre site (Area E and Waiau Village Extension), and on the 120-acre Renton Road to ORAL, ROW section.

**Area E**

*Rosa banksi* (Lepagnon leucophaeae)/Buffalo grass (*Cenchrus ciliaris*) scrub covers the portion of the study site located between the existing paved road and the golf course. Short-stemmed thickets of koa hala, 3 to 5 ft tall, are scattered throughout this vegetation type. Buffalo grass, 1 to 2 ft tall, forms dense mats to loose tussocks between the thickets. Locally common are scattered patches of yellow woodgrasses (*Chloris lanata*), teakgrass (*Eragrostis chiniensis*), huisache (*Sida fallax*), Guinea grass (*Panicum maximum*), acacia (*Acacia koa koa*), arborescent *Abutilon grandiflorum*, and monkeypod (*Samanea saman*) can be observed here and there. Old bulldozer tracks and areas with calcareous substrate are occasionally encountered. Scattered patches of false matow (*Melosporum commandolatum*), *Trianaera petiolata*, *Sporobolus sericeus*, *Sporobolus secundus*, and *Euphorbias* (*Euphorbias commutata*) common on these more recently disturbed areas.

Along the edge of the golf course (slopes of Kau'ula Gulch), the woody components became very dense. Koa hala thickets are 7 to 12 ft tall and there are small, scattered stands of evergreen kulaeke, monkeypod, *Eucalyptus*, and *opiuma* (*Phoracanthus falcatus*) trees. Shrubs of hairy abutilon (*Abutilon grandiflorum*), kau

1

2
Acanza fruticans and sauskebush (Psorpha cardenaria) are common. Robust clumps of Guine grass, 5 to 6 ft. tall, and buffalo grass, up to 3 ft. tall, form a dense cover between the woody components.

Four of the Abutilon menziesii locations occur in Area E in open koa hala/buffalo grass scrub (see Rare Plants section of this report).

Verena Village Extension
This portion of the study area located makai of the existing paved road has been bulldozed somewhat recently. Remnants of old house sites, old mango (Mangifera indica) and kalakaua (Melia azedarach) trees, overgrown gardens plots, and raised parts of painthers, storage, sheet metal, and a Sunnys Samed vehicle can be found here. The vegetation is composed primarily of weedy, annual plants. Swidden fingergrass is the dominant component. Lion's ear (Leontodon spathulatus), tall bell field bindweed (Veronica glabra), feathertop fingergrass (Cleistogenia pyramidalis), and saltbush (Atriplex sericea) are locally abundant. Other weeds observed here include golden crown-beard (Echinochloa crus-galli) Spanish needle (Bidens elatior), smooth rattlesnake (Crotalaria pallida), whaitau (Waltheria indica), castor bean, and wild tomato (Solanum Lamarckianum).

Where the property borders the HECC easement, open, grassy fields of buffalo grass are found. The woody components make up less than 5% of the cover; these include short-statured koa hala shrubs and young trees of kiawe and 'opu'a. Three medium-sized kiawe trees line the makai side of the existing paved road near the HECC easement. One plant of Abutilon is found associated with these trees. Also in this area are numerous clumps of Russian thistle or tumbleweed (Gossia trifida).

On the southwest corner of the property, there are large piles of coral rubble and boulders. This was the staging area for a sewer line at one time. The piles of excavated material are covered here and there with patches of tree tobacco shrubs (Molinia glaucescens), moss of Faya elongata, and saltbush, and shrubs of tama, whaitau, and sauskebush.

Redondo Road to OR&L ROW Section
The proposed parkway alignment in this section follows along a former cana road. It consists of a thin layer of asphalt over crushed coral with patches of asphalt moving in many places. Along the open, grassy field of the park boundary is a narrow band of woody vegetation with patches of reddish colored and. The woody vegetation consists of a mixture of swidden fingergrass, buffalo grass, green panicgrass (Panicum maximum var. schreberianum), and saltbush. A few scattered koa hala shrubs, 3 to 4 ft. tall, occur here. This area appears to have been graded when the parkway project was started.

On the makai side of the cana road, koa hala scrub borders the roadway and extends down the slopes into Keoki Gulch. Along the roadway, the shrubs are 6 to 10 ft. tall, become somewhat taller, 10 to 15 ft. tall, within the gulch. Scattered through the koa hala scrub are emergent trees of kiawe and 'opu'a, 20 to 25 ft. tall. Other woody components include sauskebush and castor bean. Buffalo grass and Guine grass form dense clumps up to 3 ft. tall in most places.

On parts of the gulch slope, there are areas with exposed reddish-colored soil. A number of short 'ohi'a plants also are found within the gulch. These open areas support a woody mixture of plants which include castor bean, cocklebur (Xanthium strumarium), golden crown-beard, hairy merraya (Euphorbia viridissima), spiny amaranth, false malow, and Jimmy weed (Bidens frondosa). Whaitau is locally abundant on these exposed areas. Other native species observed in the gulch area are 'alula and koa hala.

Along the gulch bottom, the vegetation is primarily guinea grass and buffalo grass with scattered koa hala shrubs and young kiawe and 'opu'a. In some places, there are small pools of standing muddy water. California grass (Brachytria mutia) and pionoewa willow (Salix pusilla) are associated with these areas. Parts of the gulch adjacent to the bridge are concrete filled.

RARE PLANTS
The approximate locations of Abutilon menziesii are plotted on Figure 2. Only single plants are found at locations 2 to 5. At location 1, there is a large, multi-stemmed plant about 5 ft. tall; a young, single-stemmed plant about 2.5 ft. tall, and a seedling, 4 inches tall. No Abutilon menziesii was found in the Redondo Road to OR&L ROW section. The plants are as well as the area around the plants have been flagged with blue and white striped flagging. G. Mansker, Division of Forestry and Wildlife, will more accurately map the plants using a GPS unit later on.

No other threatened or endangered species or species of concern (U.S. Fish and Wildlife Service 1989; Wagner et al. 1990) were found during the field studies. The other native species which were observed on the study site are common species which can be found throughout the islands. These are the 'alama (Salvia elegans), whaitau (Waltheria indica), and saltbush (Atriplex sp).

DISCUSSION
The vegetation on the City and County-owned lands is dominated by introduced or alien species such as koa hala, buffalo grass, kiawe, tamarisk grass, etc. For the most part, the proposed Kapolei Parkway alignment follows along an existing paved road. None of the plants found on the property, with the exception of the Abutilon menziesii, is a threatened or endangered species or a species of concern.
The City and County will need to work closely with the other agencies involved in the Habitat Conservation Plan which has been prepared for the endangered *Abutilon* on the Kapolei site. Plant material from the five locations within the study site will need to be collected for propagation and included in future outplantings.

References


Figure 1
Regional View of Kapolei Parkway Extension Study Area

Figure 2
Kapolei Parkway Extension Study Area - North-South Road to Renton Road Section
Department of Land and Natural Resources
Division of Forestry and Wildlife
Natural Area Reserve System
Interim Management Report
for
*Abalata merrillii*
April 24, 2001

The following is a summary of activities implemented during the Department of Land and Natural Resources (DLNR) under the agreement, East Kapalama Natural Area Reserve Management Plan for the Endangered Species, *Abalata merrillii*, during the 31-month period October 1, 1999 to April 30, 2001. This report will participate in the activities completed during each of the 10 quarters of that period. We have not completed all activities set forth in the agreement. The only task that remains is the completion of a greenhouse (Task 5). This is a final report. This report will include all tasks that have been completed.

Task 1: Males existing population of *Abalata merrillii* on State land at East Kapalama, Oahu, Hawaii. This work will include the following:

1. Monitoring

A total of 76 visits were made to the *Abalata merrillii* plants at Kapalama between October 1999 and March 2000. Two DLNR staff conducted most of the site visits. The location of the visits per quarter can be found in Table 1 below. Each plant was given a number and a permanent tag. The numbers are given in places followed those assigned during the survey done by Kenneth Nagae in December 1995. About 40 percent of the plants were surveyed, the remainder of the plants located during the regular surveys. As part of the monitoring process, live plant survey plans were not found in the original survey. These plants were located in the groups area near the DLNR palisade. No new plants were found during the January surveys. As part of the monitoring process, one live plant survey plan was found in the original survey. These plants were located in the groups area near the DLNR palisade. The number of original plants was 36 found during the December 1995 survey by Kenneth Nagae. The total 6 new plants were surveyed the 10 visits made by DLNR staff during this period. New plants were surveyed during the ten visits made by DLNR staff during this period. The total 6 new plants were surveyed during the ten visits made by DLNR staff during this period. The new plants were surveyed during the ten visits made by DLNR staff during this period.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Number of Site Visits</th>
<th>Total Time</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3</td>
<td>15</td>
</tr>
<tr>
<td>January 1999 - March 1999</td>
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<tr>
<td>April 1999 - June 1999</td>
<td>3</td>
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<td>July 1999 - September 1999</td>
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<tr>
<td>October 1999 - December 1999</td>
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<tr>
<td>January 2000 - March 2000</td>
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<td>20</td>
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<td>April 2000 - June 2000</td>
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<tr>
<td>October 2000 - December 2000</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>January 2001 - March 2001</td>
<td>4</td>
<td>20</td>
</tr>
</tbody>
</table>

2. Maintenance

Plants were maintained during each visit and treated on separate times with systemic insecticide to control kikia and scale, ants, and mainly bugs. Vegetation immediately adjacent to each plant was maintained during each visit to keep potential fire fuels away from the plants. Plants were not fertilized because of a concern of encouraging self pollination in the wild plants that could not be maintained without the introduction of a permanent irrigation system.

3. Survey

A fire plan has been implemented for the area that creates fire breaks around the *Abalata merrillii* population and inhibits plant fire spread. The fire fighting crew is available near the East Kapalama Natural Area Reserve for the *Abalata merrillii* population and provides information to their resources at various locations including the DLNR site plan for the protection of the plants. Fire fighting crews are available near the East Kapalama Natural Area Reserve for the *Abalata merrillii* population and provides information to their resources at various locations including the DLNR site plan for the protection of the plants. Fire fighting crews are available near the East Kapalama Natural Area Reserve for the *Abalata merrillii* population and provides information to their resources at various locations including the DLNR site plan for the protection of the plants. The potential ignition sources for fires in the East Kapalama area are accidental ignition sources from children playing with fire, campfires, wood burning, vehicles in dry flashy fuels, trash of fireworks, and intentionally set fires. Fireworks are present during the New Years and Fourth of July holidays and illegal nuclear fires and are becoming more prevalent during those times. The potential for fires at the reserve is high. Fire fighting crews are available near the East Kapalama Natural Area Reserve for the protection of the plants. Fire fighting crews are available near the East Kapalama Natural Area Reserve for the protection of the plants. Fire fighting crews are available near the East Kapalama Natural Area Reserve for the protection of the plants.

The firebreak is still in place because we have not received any significant rainfall in the area since the establishment of this firebreak.
The fire fighting resources available at Station 40 in Kapolei are an Engine, a Ladder truck, and a Brush Fire truck. A Honolulu Fire Department Battalion Chief is stationed at Station 40. The next closest fire unit to Station 40 is Station 13 in Waipahu. Station 13 has an Engine, a Ladder truck, and a Water Tender. Station 35 in Makaha is the third closest unit to the area and it has an Engine on site. Station 28 in Makaha is the fourth closest unit with an Engine and a Water Tender on station. The GIS map we developed shows all the access roads to the main population centers. This map will be provided to the 50 fire stations.

Task 2: Propagate a total representation of plants through seeds and cuttings from the East Kapolei Ahuwhenua population.

Task 2 of the agreement has been completed. All the known East Kapolei Ahuwhenua individuals plants have been propagated through cuttings. Figure 1 shows many of the 630 plants we have propagated from cuttings so far. The bullet below details the propagation work we have done.

Table 2 below details the cuttings taken from the East Kapolei Ahuwhenua plants per quarter. Each cutting taken from an East Kapolei plant can be divided into up to six cuttings. We attempt to produce a plant from each cutting but not all are successful. Figure 2 is a photo of many Ahuwhenua plants ready for propagation.

- A total of 630 plants have been propagated from cuttings of 62 East Kapolei individuals.
- 280 seedlings have been produced from seed. This seed was collected from nursery plants grown from cuttings of the East Kapolei population.
- Research on optimum germination methods is ongoing. We are using an heating mat under the seeding tray in speed germination rate. This method has been successful in speeding germination rate from 3 to 4 months with regular germination techniques to 2 to 3 weeks using this technique.
- We have sent over 800 seeds to the National Seed Storage Lab in Fort Collins, Colorado. These seeds are from nursery plants.
- We have seeds from 50 of the East Kapolei plants in storage at the Pahala Farm plant facility.

<table>
<thead>
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<tr>
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<td>October 2000 - December 2000</td>
<td>0</td>
</tr>
<tr>
<td>January 2001 - March 2001</td>
<td>0</td>
</tr>
</tbody>
</table>
Task 1: Establish new wild population of Phalaenopsis in appropriate habitat

The new planting sites have been identified as the initial sites for the establishment of new wild populations of Phalaenopsis. The site is on conserved land on the Malheur side of Kanaka Point and the second is in the City and County of Humboldt land on Kanaka Point.

The first planting site is located at the Kanaka Point Natural Park. The Humboldt Botanical Gardens provided a 100,000 site area for the initial planting on 10

November 2005, 100% of the plants were propagated from seeds provided by the Humboldt Botanical Gardens staff. The plants have been monitored with a strip irrigation system and are thriving. The Humboldt Botanical Gardens staff will continue to monitor the plants to ensure their survival.

The second planting site was located on the Humboldt Botanical Gardens property. The site area was thoroughly monitored, and the plants have been propagated from seeds provided by the Humboldt Botanical Gardens staff. The plants have been monitored with a strip irrigation system and are thriving.

Task 2: Research the Biology of the Phalaenopsis population

1. Description and Distribution

The University of Hawaii has not yet been successful in documenting the Phalaenopsis population.

2. Functional Adaptations

These plants are well adapted to the environment in which they live.

3. Current Status

The plants are listed as threatened species and are protected under state law.

When the above sites are established, we will consider the following sites for propagation:

- Kauai Island
- Honolulu
- Kealakekua Bay
- Kauai Island
- Halawa Valley
- Kona Coast
- Kauai Island
- East Kauai
- Kauai Island
- Kauai Island

Task 3: Provide permit funding for the construction of additional greenhouse facilities

We have been working on getting a permit for the construction of additional greenhouse facilities for the Phalaenopsis population.

The permit was obtained from the U.S. Fish and Wildlife Service. We have been working on obtaining permits for additional greenhouse facilities for the Phalaenopsis population.

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The permit was obtained from the U.S. Fish and Wildlife Service. We have been working on obtaining permits for additional greenhouse facilities for the Phalaenopsis population.
water and proper water. Camp Leeban offers the benefits of 24 hour security and the potential as an educational outreach site for the entire region. This site is considered a backup site because of the amount of work involved in securing the many tree wood trusting the site. The other requirements are that because the site is so close to the ocean, the area would receive heavy
salt spray and would be desiccated by salt water during periods of high surf.

The primary site identified for the nursery in on land owned by the State of Hawaii and leased to Mr. Ron Wellbrook of Fish Farm Hana. The parcel is located in lot 3 of tax 5-9-4-3. Mr. Wellbrook has approved DNR for a portion of lot 3 to establish a nursery. The advantage of this site are, within a hundred yards of a water source, within a hundred yards of a power source, within a 8 feet high chain link perimeter fence, located away from the direct influence of the waves and salt spray, and above a planned coastal or sea wall which will provide protection of the site. We are currently working with Mr. Charles Uehli, Division of Property Management, DNR, to correct the base of this parcel to the Division of Forestry and Wildlife. Mr. Wellbrook expects to complete the transfer of this property and begin construction soon. We will submit the final report for the Housing and Community Development Corporation of Hawaii when we have completed the construction of this greenhouse.

Appendix G
Final Interim Management Report
for Abutilon menziesii
(October 1, 2003)
Department of Land and Natural Resources
Division of Forestry and Wildlife
Natural Area Reserve System

Final Intent Management Report
for

*East Kapo'olau Area Reserve

Action completed by the Division of Forestry and Wildlife
October 31, 2003

The following is a summary of actions implemented by the Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW), for the endangered species, Haliotis rubra, during the 30-month period from April 15, 2003 to October 31, 2003. This is a final report on the interim management activities completed by DOFAW. The Halau Conservation Plan (HCP) for the East Kapo'olau Area Reserve is currently complete. The Board of Land and Natural Resources must approve the HCP before the plan is considered complete. All future reporting on the management of East Kapo'olau Area Reserve will be done in relation to the HCP.

Project Description
The East Kapo'olau Area Reserve population was discovered in 1996 by Kenneth Haga during a biological survey conducted for PBR Hawaii, a consulting firm hired by the State of Hawaii agency, then known as the Housing Finance and Development Corporation. This survey was done for the East Kapo'olau Master Plan project that proposed a mixture of residential and commercial development projects for the area. The East Kapo'olau area was to undergo severe cultural alteration for a century when agricultural operations ceased in spring 1996. The State of Hawaii, Department of Transportation, and the City and County of Honolulu, Department of Transportation Services commissioned another biological survey by David and Associates, Biological Associates, for proposed highway. The result of that proposed highway, known as the North Shore Road, appears directly through a significant portion of the East Kapo'olau reserve's habitat population. These surveys are documented in previous versions of the East Kapo'olau Master Plan Biological Conservation Plan for East Kapo'olau Area Reserve

In 1999, the State of Hawaii, Housing Finance and Development Corporation, which had changed its name to the Housing and Community Development Corporation of Hawaii (HCDC), entered into an agreement with the CHBD/DOFAW for the interim mitigation of the East Kapo'olau population. This agreement (dated in Appendix A), which was signed on September 15, 1999, was the result of an agreement with PBR Hawaii, dated from October 1, 1998 to March 31, 2000. The agreement was to provide $45,000 to complete 3 main tasks in relation to the protection of the East Kapo'olau area reserve's population and the conservation of the species. The main tasks were: 1) Maintain existing population of Haliotis rubra on State land at East Kapo'olau, Oahu, Hawaii. 2) Propagate a total population of plants through seedings and cuttings from the East Kapo'olau area reserve's population. 3) Establish two wild populations of Haliotis rubra on the island of Oahu. 4) Research into the biology of the Haliotis rubra population. 5) Provide partial funding for the construction of a non-alternative government dedicated to the conservation of Haliotis rubra and other threatened and endangered plant species on Oahu. This report, Haliotis rubra Area Reserve Management Report dated April 24, 2001 documented the work done by DOFAW from October 1, 1998 until the report date. DOFAW's report was paid $45,525 for the work accomplishments documented in this report. All photos of tasks 1, 2, and 3 were completed during that period. At the end of the final report, we were unable to complete all of tasks 1 and 3 of the original agreement. We were unable to complete task 3, the establishment of two populations of Haliotis rubra on State land because the difficulty in finding suitable habitat in the area and the difficulty in establishing plants at the end of the period. We were not able to complete task 3, the establishment of a less critical population, because finding suitable habitat in the area and where to locate a population was feasible with a small budget.

A second agreement between CHBD and DOFAW was signed on January 30, 2001 for tasks 1, 2, and 3. This agreement was signed to complete the tasks that were not fully completed in the first agreement. This agreement covered actions taken on the establishment of two populations, construction of agreements, and the completion of all tasks 1, 2, and 3. In this agreement, DOFAW was to complete the remaining tasks during the period from November 1, 2000 to October 31, 2001. DOFAW was committed to work through the problems encountered with completion of tasks identified in the second agreement. However, we were not able to complete them fully by October 31, 2001. DOFAW was not able to complete the East Kapo'olau Master Plan in the area. DOFAW did not receive the $37,250 that was to be used to complete the tasks in the second agreement. This agreement will contain the completion of tasks completed by DOFAW in the period April 24, 2001 to March 31, 2000 that were identified in the original agreement. IF DOFAW still has a supply of funding to complete the second agreement, we will complete the work. The DOFAW only paid about 60% of the $37,250 that was expected to be funded to complete the second agreement. The DOFAW has also been unable to complete the work and support links related to the conservation of this species.

ACOMPLISHMENT OF TASKS

Task 1: Maintain existing population of Haliotis rubra on State land at East Kapo'olau, Oahu, Hawaii. This task will include the following:

1. Monitoring

A total of 30 units were used in the Haliotis rubra population at Kapo'olau between April 2000 and October 2003. The Haliotis rubra on the State land at East Kapo'olau was monitored over a month, three times per quarter. Each plot has been a plot 900 square feet and a permanent tag. The numbers of plants left and those removed during the survey done by Kenneth Haga in December 1997, where appropriate. The total number of plants removed at the time of the last report was in 27. The DOFAW Haliotis rubra has found in Haliotis rubra on the East Kapo'olau area since the last report. The numbers were assigned to plants. We have a tabulation of the numbers of these plants. The plants are not only used to be identified but the areas for species.
The East Kapuhi area has been in drought conditions since April 2001. In the spring of 2002, the area did receive a few significant rains. In surveys done at East Kapuhi by BLH/DHS/USGS in March through May 2001, many clumps of leaves were found. The botanists noticed that the survival of the seedlings was less likely if they were transplanted when they were still small. At a total of 25 seedlings from the East Kapuhi population were dug up and transplanted to the newly outsourcing site at the Honolulu Unit of the Pearl Harbor National Wildlife Refuge. 21 seedlings of known parentage and 10 seedlings of unknown parentage that were removed from the East Kapuhi population have been planted there. A small portion of the seedlings planted at the East Kapuhi population (approximately 19%) during the spring of 2002 were left at East Kapuhi and subsequently perished.

In the winter, April 24, 2001, several of the original clumps have died due to natural causes. The number of plants still alive is between 23 and 40. Determining whether the dead clumps were killed by drought or a different cause was difficult. The plant may appear to be only dead but a heavy rain will cause the plant to suddenly sprout green leaves. Therefore it is difficult to give a definitive total on the plants that are alive. In Appendix C, we have a table with all known, dead and dying plant locations, their parentage, and boundaries relative to existing infrastructure and boundaries. In Appendix D, we provide a map with all known, dead and dying plant location, existing infrastructure, and boundaries overlaid on existing land photo from 1993. This was in an effort to depict the East Kapuhi population in HDOIC DEC.

2. Maintenance

Irrigation was provided to the 16 new plants to enhance their establishment. A small amount of fertilizer was given to all the new plants. Weeding was done around the base of all plants, including the plants that have died. It also removes the vegetation of other species around the mother plant and to reduce competition from weed species.

3. Security

A fire plot has been implemented in the area that created a fire break around the known marginal populations and individual plants. This firebreak is the only defense that is available to any of the targeted populations and protects the new plants from fire. We have contacted the Hawaii Island Fire Protection to produce a detailed map of the known plants and the fire breaks in the area. This map will be provided to the Fire Protection Services to help them in their efforts.

The potential ignition sources for fire in the East Kapuhi area are unincinerated garbage from churches and shops with a fire risk to the environment. In the area, the total area is over 1000 acres and a fire has been started.

The long-term care of these plants must be considered when planning a new population of clumps. The plants must be protected and monitored to ensure that they are not disturbed. The long-term care of these plants will be propagated by planting them in other locations. The long-term care of these plants will be propagated by planting them in other locations. The long-term care of these plants will be propagated by planting them in other locations.
population under the first interim mitigation plan agreement between ERCB and DEERGAW when it was initially established. Since then, as the establishment of this site, we have received consent from the Federal Species Recovery Committee and others. Those comments have caused ERCB and DEERGAW to reconsider the appropriateness of this population to be considered a wild population. ERCB and DEERGAW agree that since this site is within a public display facility that it should not be considered a wild population for the purposes of the Habitat Conservation Plan. In addition, the plants of the Deer Creek system have been on deep importation since they were planted. This has caused the plants to grow taller and have more vertical growth than they would in a truly wild population. ERCB and DEERGAW have this population as a living collection representing the genetic stock of the East Kestrel (Adhenes eremophilus) population. ERCB and DEERGAW will work with the staff at the Deer Creek Rehabilitation Garden to coordinate the movement of this population.

2. Kensington Point The Kensington Point outplanting site was established in April 2001. The outplanting area is about 48 km south of the end of the paved Farming Highway and the vehicle barrier at the entrance to the Kensington Natural Area Reserve. The land is under the jurisdiction of the LUSK Division of State Parks (TH&I, 6.9.02, Panel 4). The LUSK Flora and Fauna Preservation Division declared that the establishment of the outplanting site would not have a significant effect on significant natural sites. The City and County of Honolulu Planning Section declared that this site is within the Special Management Area. However, the work of developing the outplanting site did not require a permit because it was not considered development.

The approximately 5.7-hectare outplanting area was established with two distinct planting areas separated by a four-lane divided road. The site was completely protected from off-road driving by a barrier along the dirt road leading to the outplanting site. The total area of the planting site was nearly 5,000 m². The barrier has been constructed of steel and wood and has been reinforced with cement and metal. We have used the area with walkways to plant the various species. A total of 647 plants were planted by 6 April 2001. We have planted 81 additional plants since April 2001. A total of 142 plants have been successfully planted in the Kensington Point outplanting site. The plants were planted at the site to promote their establishment. The approach we have taken at this site is to encourage the plants to establish themselves in the natural habitat. We have provided the plants with water and nutrients to help the plants establish themselves in the natural environment. We have also provided the plants with sunlight and shade to help them establish themselves in the natural environment. We have also provided the plants with sunlight and shade to help them establish themselves in the natural environment. The plants along the edge were affected by the fire, but they are not completely damaged. It is possible that many of these plants will establish themselves in the natural environment.

The Kensington Point outplanting site is not as large as the Kensington Natural Area Reserve. The area is approximately 5,000 m². The site is located in the natural area and is surrounded by a fence. The fence is made of steel and wood. The site is enclosed by a fence, and the fence is made of steel and wood. The site is enclosed by a fence, and the fence is made of steel and wood. The fire destroyed nearly all of the plants that had been established at this site. The fire destroyed nearly all of the plants that had been established at this site. The fire destroyed nearly all of the plants that had been established at this site. The fire destroyed nearly all of the plants that had been established at this site. The fire destroyed nearly all of the plants that had been established at this site.
The HCP should set aside enough funds to cover the full costs of developing and maintaining an upmonitoring site. The money provided under the agreement with HEC○ will provide funds to establish the upmonitoring site and the initial upmonitoring, and provide funds to cover the first year of the HEC○ upmonitoring fee. The total costs to establish this upmonitoring site will be $15,000. This does not include the cost of staffing for the HEC○ upmonitor site. The cost would have been significantly higher if the site was finalized from this report.

The initial establishment of upmonitoring sites will be the most expensive phase of the project. Future upmonitoring sites should be considered when developing an upmonitoring site for a new upmonitoring population. 3) The site should have a base area of at least a 2-acre plot identified and recorded in the permit. 4) It is important that the upmonitor site is managed with regular upmonitoring, if that is not possible, the upmonitor fee and the management fee to maintain the area should be identified upmonitor site. The upmonitor site should be maintained with frequent upmonitoring. 5) The site should be upmonitoring for significant numbers of times and effort to get permanent and accurate data. 6) The presence of the site with access to water and power should be maintained and addressed in the establishment of the site. The HCP should start the first few years of the site with the site associated with initial development of upmonitoring sites.

3. Hawaiian Island Bird and Wildlife Refuge

A third upmonitoring site has been developed at the Hawaiian Island Bird and Wildlife Refuge of the U.S. Fish and Wildlife Service Pearl Harbor National Wildlife Refuge that borders the west side of Pearl Harbor (HAW 9.11). This 30-acre site is located in a fen area west of Honolulu, is under an upmonitoring contract for the upmonitoring and security for the site. There is an upmonitor site within this unit that we felt was suitable for placing an upmonitor site. We installed an upmonitoring system at this site in 1999 with the initial establishment of the site. We now have a total of 44 upmonitoring sites at the Hawaiian Island Bird and Wildlife Refuge. The survival rate of the birds upmonitoring at this site is 95%. None of the birds that were upmonitoring at this site were removed from the site each year.

In addition, 25 seedlings of known provenance and 16 seedlings of unknown provenance were removed from the site. These seedlings were removed from the site each year. A small portion of the seedlings produced at the Hawaiian Island Bird and Wildlife Refuge was also removed. These seedlings were used to provide an upmonitoring site at this site. The survival rate of the birds upmonitoring at this site is approximately 95%. There is no survival rate to maintain any more upmonitoring sites.

The third upmonitoring site is the minimum. The light-footed lava makes a barrier to most of the upmonitoring sites. A buffer of approximately 6 feet of buffer was set in place to protect the upmonitoring site. The buffer strip also serves as a barrier to protect the upmonitoring site. The portion of the buffer that doesn't have this buffer is the same exact buffer that was set in place. The only buffer that was set in place is to make sure the buffer is maintained in place.
AGREEMENT

THIS AGREEMENT is made this 15th day of September, 1999, by and between the HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAI'I ("HCDDC"), a public body and body corporate and politic of the State of Hawaii, whose post office address and principal place of business is 877 Queen Street, Suite 305, Honolulu, Hawaii 96813, and the DEPARTMENT OF LAND AND NATURAL RESOURCES ("DLNR"), State of Hawaii, whose address is 1151 Punchbowl Street, Honolulu, Hawaii 96813, and

WHEREAS, the Department of Land and Natural Resources ("DLNR"), has title to that certain real property situated at Honolulu, Oahu, Hawaii, containing an area of 3.200 acres, and identified as tax map key: 9-1-016-000, 9-1-016-109, 9-1-017-006, 9-1-017-007, 9-1-018-003, and 9-1-018-005 (collectively referred to as "East Kapolei State Land Bank," and

WHEREAS, DLNR is in the process of transferring title of the East Kapolei State Land Bank to HCDDC for development purposes in order to satisfy its housing and economic development goals, and objectives, specifically to generate funds for the University of Hawaii at Manoa to facilitate the development of private sector housing units, and to provide off-site infrastructure for the 200-acre site to be transferred to the Department of Hawaiian Homelands, and

WHEREAS, HCDDC is the designated master plan developer for the East Kapolei Master Planned Development Project, which encompasses the East Kapolei State Land Bank, and

WHEREAS, HCDDC has filed a Final Environmental Impact Statement (FEIS) for the East Kapolei State Land Bank. The FEIS was accepted by the Governor of the State of Hawaii on September 21, 1999, conditioned upon satisfying the requirements of Chapter 343, Hawaii Revised Statutes, and specifically to implement the Habitat Conservation Plan for the endangered Hawaiian mourning dove in accordance with the requirements of the U.S. Fish and Wildlife Service and the State Department of Land and Natural Resources;

WHEREAS, DLNR has the capability of performing the plant mitigation and has the knowledge and expertise to administer the mitigation of the endangered Hawaiian mourning dove, and is willing to provide services for the inter-mitigation of the endangered Hawaiian mourning dove,

NOW, THEREFORE, in consideration of the premises above, the parties mutually agree as follows:

APPENDIX A

<table>
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<th>ITEM</th>
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<td>1</td>
<td>Steward Agreement for the East Kapolei Wildlife Mitigation Plan</td>
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THESE ARE TRANSMITTED as attached below:

For approval

Approved as amended

Approved as submitted

Rejection received

FOR DISCUSSION

REMARKS

IF THERE ARE ANY QUESTIONS, PLEASE CONTACT

Ho'oma'ana

TELEPHONE NO. 387-2019

COPY TO

IF ENCLOSED ARE NOT AS NOTED, SIMPLY NOTIFY US AT ONCE

DIG (1804197)
1. DNR shall perform the tasks set forth in "Exhibit A", attached hereto and incorporated herein. DNR shall provide reasonable safeguards to secure the existence of the endangered Abalon Henisii, to maintain the existing plant population, to establish a new "wild" population, and to perform research into the biology of the endangered Abalon Henisii.

2. HCCH shall pay to DNR the total sum of $67,660.00 as set forth in "Exhibit B", attached hereto and incorporated herein. Quarterly payments will be made upon submission of written quarterly reports of progress to HCCH.

3. DNR will perform the tasks during an 18-month period, beginning on October 1, 1990 and ending on March 31, 2000.

4. This Agreement shall be null and void if the Habitat Conservation Plan is not approved by DNR.

5. This Agreement may be terminated at any time by written consent of both parties.

IN WITNESS WHEREOF, the undersigned have executed these presents as of the day and year first written above.

APPROVED AS TO FORM:

[Signature]

Housing and Community Development Corporation of Hawaii

[Signature]

[Title]

DEPARTMENT OF LAND AND NATURAL RESOURCES

[Signature]

[Title]

[Revised 2/2000]
1. Contract the University of Hawaii to document past research on the Abutilon menziesii population.

2. Perform testing and identify testing parameters as follows:
   a. Test granular diatomaceous use in controlling ants.
   b. Test biotin and encapsulated Dursban on a few plants to determine toxicity.
   c. Test seed storage in quenepoite facilities in the event of problems with wild populations.
   d. Test soil testing parameters for outplanting site selection to include, but not limited to, salt
      wetness, occasional storm wash influence, associated soil organisms, and accompanying pests.

E. Task 5
Construct a greenhouse dedicated to growing Abutilon menziesii endangered plant species. The greenhouse would
serve as a long-term greenhouse for threatened and endangered plant species on Oahu. Task 5 includes the
following scope:

1. Site Preparation
   a. Clear and grade the greenhouse site, having approximately 0.3 acres in site; and
   b. Construct an eight-foot high chain link fence.

2. Water Supply
   a. Develop a permanent water source for greenhouse
      irrigation;
   b. Purchase and construct a 5,000 gallon tank for
      emergency backup water supply; and
   c. Provide irrigation system for greenhouse.

3. Greenhouse Construction
   a. Construct a greenhouse using a prefabricated
      greenhouse kit;
   b. Construct two shade structures for preparing
      nursery stock for outplanting; and
   c. Purchase benches, pots, and equipment necessary to
      operate the greenhouse.

F. Administration
Document findings and prepare quarterly reports of progress.
At the end of the contract period, prepare a summary final
report which provides a recommendation of action and
possible alternatives, if any, based upon documented
findings and results.
Habitat Conservation Plan
for Abutilon Menziesii at Kapolei
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<td>(2) Describe the activities contemplated to be undertaken within the plan area with sufficient detail to reflect the extent to which the activities on the particular ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan habitat types in the plan area are the focus of the plan</td>
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<td>(3) Identify the steps that will be taken to minimize and mitigate all negative impacts, including without limitation, the impact of any authorized incidental take, with consideration of the full range of the species on the island so that cumulative impacts associated with the take can be adequately assessed; and the funding that will be available to implement these steps</td>
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(4) Identify those measures or actions to be undertaken to protect, maintain, restore, or enhance the ecosystems, natural communities, or habitat types within the plan area, a schedule for implementation of the actions or measures, including monitoring, that are to be undertaken in accordance with the schedule | 41   |

(5) Be consistent with the goals and objectives of any approved recovery plan for any endangered species or threatened species known or reasonably expected to occur in the ecosystems, natural communities, or habitat types in the plan area | 50   |

(6) Provide reasonable certainty that the ecosystems, natural communities, or habitat types will be maintained in the plan area, throughout the life of the plan, in sufficient quality, distribution, and extent to support within the plan area those species typically associated with the ecosystems, natural communities, or habitat types, including any endangered, threatened, proposed, and candidate species known or reasonably expected to be present in the ecosystems, natural communities, or habitat types within the plan area | 51   |

(7) Contain objective, measurable goals, the achievement of which will contribute significantly to the protection, maintenance, restoration, or enhancement of the ecosystems, natural communities, or habitat types; time frames within which the goals are to be achieved; and provisions for monitoring (such as field sampling techniques) and evaluating progress in achieving the goals quantitatively and qualitatively | 53   |

(8) Provide for an adaptive management strategy that specifies the actions to be taken periodically if the plan is not achieving its goals | 56   |

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EXECUTIVE SUMMARY

A population of A. muelleri was discovered in late 1992 at Kapolei in the Ewa area, Island of Oahu. This population is referred to as the "Kapolei population." A. muelleri is a currently endangered species in the Santa Cruz Island group and is abundant in the Ewa area. It is estimated that there were 50 to 100 plants in the Ewa area. A. muelleri is a species of concern in the Near Threatened category of the U.S. Endangered Species Act of 1973, as amended, and Chapter 69, Hawaii Revised Statutes, as amended. A. muelleri is one of five species included in the Lualualei Nature Conservation Act (HRS 682-34).

This habitat conservation plan is prepared pursuant to Chapter 195-31, HRS, as amended. Accordingly, the HCP provides a description of the development actions proposed on the 1,300-acre State-owned property and an adjacent 25-acre City and County of Honolulu ("City") property at Kapolei (referred herein as the "Kapolei property"). The HCP describes the impacts of development actions on the Kapolei population and proposes a series of mitigation strategies that would provide a net gain of 1.5 acres to the recovery of the species.

The implementation of this HCP began in 1997, with drafts prepared in 1997, 1999, 2001, and 2003 and reviewed by the U.S. Department of the Interior, Office of Extraneous and Environmental Quality (DEQ), the Endangered Species Recovery Committee (ESRC), and the DSNP Endangered Species Committee (DSNPESC). The present HCP incorporates the actions which have been included in the site-specific mitigation plans and the existing measures for the Kapolei population that are planned over a period of approximately 20 years.

The sponsor of this HCP is the State Department of Transportation ("DOT"). The site is a portion approximately 24 acres of the Kapolei property from DLNR for the proposed North-South Road Project. The Housing and Community Development Corporation of Hawaii ("HCDC") had also previously contributed substantially to the development of the HCP and its Implementation Plan.

The Presence of Schizothorax monticola at the Kapolei Property

For nearly a century, the Kapolei property was used for sugarcane. According to the Oahu Sugar Company, sugarcane was last harvested on the property in 1949, prior to the permanent closure of the company in 1949. The site was a two-year crop, and harvesting practices involved burning to reduce the leaf bulk before the cut stumps were mechanically harvested. Generally, the site was in such a field from 20 to 30 minutes. The now abandoned fields in the Kapolei property were exposed to sun during every two years during nearly ten decades of crop cultivation.

Botanical surveys of the Kapolei property have been conducted by Kenneth H. Wada (1998) and U.S. Fish and Wildlife Service (1998, 1999, 2001, 2004). The survey reports are attached as Appendices A, B, C, D, and E, respectively.

The property is described as a disturbed site characterized by the dominance of alien weed species interspersed with remnant sugarcane. Therefore, the site is categorized as "disturbed." It is an area with a high potential for the introduction of invasive species. The site is in close proximity to the site of the proposed project at Kapolei East. The December 1997 survey conducted by U.S. Fish and Wildlife Service (USFWS) in 2004, the completion of a survey of the City property and discovery on an additional 7 plants.

The plants are spatially dispersed in five clusters in the central and southern portions occupying approximately 20 percent of the Kapolei property and are described as Cluster A, B, C, D, and E. The survey results indicate that the present number of plants has been reduced between 30 and 50 percent, but new trends have been recently recorded by USFWS in 2004. However, this HCP is not generally based on the literature number of 93 plants.

Landowners

The State-owned Kapolei property, consisting of approximately 1,300 acres, was previously owned by the United Sugar Company, Limited, in 1953, prior to its closure, the land was transferred to the Department of Interior, U.S. Department of the Interior ("USDI"). Through a real estate agreement with HCDC, the property was transferred to DLNR in 1968 for use as a site for the development of Kapolei in the secondary urban center of the City and County of Honolulu and the State of Hawaii. The land, however, was sold in 2002 and 2003, and 300 acres were transferred to the University of Hawaii for a new West-Oahu campus. In addition, 200 acres will be transferred to the Department of Hawaiian Affairs ("DHA") for commercial development. Both the University of Hawaii and the DHA have received right-of-entry to the property and HCDC's right-of-entry has been terminated. The remaining 600 acres were returned to DLNR.

A portion of the proposed North-South Road Project is used by DLNR and a portion is used by the U.S. Department of the Interior, U.S. Department of the Interior ("USDI"). The development of the North-South Road will require property conveyance from DLNR. The site is in a development area and the development actions are anticipated to be accomplished in 2004 prior to the commencement of construction.

The City of Honolulu is comprised of portions of two large parcels of land which include the adjacent existing Ena Village Gold Course and the north half of the Kapolei property. The City of Honolulu is in close proximity to the site of the proposed project at Kapolei East. The Proposed Developments

Developments proposed by public agencies include the North-South Road, the Kapolei Parkway segment, and the University of Hawaii West-Oahu campus. In addition, DLNR will develop residential subdivisions for native Hawaiian beneficiaries. Collectively, the HCP refers to these developments as the "North-South Road Project."
developments as the "Kapolei projects". The remaining DLNR land area has also been planned for urban use, however, no specific development proposal is under consideration at this time.

**South South Road**

The Department of Transportation is proposing to develop the South South Road, a federal-aid highway, which would be a principal arterial roadway providing support to the regional network of roadways and to the Interstate Route H-1 ("H-1 Freeway"). The South South Road would shorten and provide access to the land developments in the Kapolei property and also provide an alternate access roadway for other Kapolei and Ewa communities.

The South South Road would traverse the Kapolei property between the "H-1 Freeway (located to the north) and the City's segment of Kapolei Parkway (located to the south)."**

**Kapolei Parkway Extension**

The Kapolei Parkway segment is a 3-mile major collector roadway which will link the South South Road and Ruston Road and existing segments of the Kapolei Parkway. The subject roadway project will traverse the City's Ewa Village property and will provide an alternate regional access to the H-1 Freeway. Regional access to Interstate H-1 is currently limited to Fort Weaver Road. The Kapolei Parkway segment is also a federal-aid highway project.

**Department of Hawaiian Home Lands**

DHHL is mandated to develop and deliver homesteads to qualified native Hawaiians. The development of 9,000 acres of DHHL lands would include approximately 1,000 residential homesteads and potentially some commercial and community facilities since to serve its new inhabitants. The first phase is planned for occupancy in 2000 and building is expected to begin in 1997.

**University of Hawaii West Oahu**

The UH West Oahu campus will be a major educational facility in Kapolei, primarily serving the Hanford and Central Oahu region. The University is currently exploring options for the development of the campus and is in the process of planning an approximately 160-acre campus which will be developed in phases to accommodate an eventual student population of 7,600. Additional land will be acquired on the property for future campus expansion beyond the 7,600 student population. The University is also considering a number of land use options for the remaining 310 acres of land within the 250-acre property to serve the campus and surrounding region. Construction of the initial phase of the campus could begin in the later part of 2005, with a completion date of Fall 2007. The initial phase of campus development would be located in the northeastern portion of the property, in close proximity to Farrington Highway.

**Department of Land and Natural Resources**

The 600 acres of land under the authority of the DLNR Land Division have been previously planned for residential and school facilities as well as open space areas, which would serve as drainage detention basins as part of the East Kapolei Master Plan. The ultimate specific uses of these lands will be determined in the future.

**Habitat Conservation Plan Goals and Objectives**

Pursuant to Chapter 195O, the habitat conservation plan shall contain sufficient information for the Board of Land and Natural Resources ("DLNR") to determine with reasonable certainty the likely effect of the plan upon any endangered, threatened, proposed, or candidate species in the plan area and throughout its habitat range. Thus, the goal of this HCP is to identify and set forth a program which would result in no overall net gain in the number of threatened species on Oahu, thus, contributing towards the recovery of the species as required by HRS Chapter 195O-2 defines "Conservation" to mean that "the number of individuals of the protected species has increased to the point that the presence of the species no longer requires prohibited or restricted activities."**

The objectives of the HCP are to achieve (1) to achieve the goals of conservation of the Kapolei projects. (2) to increase the potential impacts of the Kapolei projects, to achieve (3) to achieve the goals of conservation of the Kapolei projects, and (3) to achieve the goals of conservation of the Kapolei projects. The project is designed to mitigate impacts and to reduce the species in the area of the project by providing wildlife habitats on Oahu from the single degraded Kapolei population.

To test whether new populations could be established from Kapolei stock of L. abronius, an interim Management Program was initiated in 1996 and funded by HUC. This project has successfully been implemented by DLNR. A representative of the DLNR program has reviewed the project and recommended that the project be reviewed and updated. The Management Program is updated in detail in Strategy (HRS Section 3) and in the DLNR Draft and Final Interim Management Report for Habitat Restoration (2001, 2002).

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Impacts and Mitigation Measures

The development of the Kapolei projects is expected to result in incidental take of the entire Kapolei population during an approximately 20-year development period. Therefore, a series of actions are proposed that will produce three new "wild" populations, protect the genetic diversity of the existing population, and protect existing individuals by relocating them to the new populations.
locations. This HCP also proposes long-term management that would occur concurrently with project development to ensure that benefits are realized for 4 years.

The duration of the HCP implementation and active management period is approximately 20 years and is tied to the accomplishment of the measurable goals that include the establishment of a minimum of 300 acres of self-sustaining populations. The successful implementation of the HCP would significantly increase the numbers of new plants on Oahu as well as improve their quality compared to the site disturbed and cleared conditions at the Kapolei property.

Funding and Implementation

The primary funding mechanism is a trust fund for endangered species as promulgated in Chapter 195D-11, HRS. DOT will provide the funding to implement the HCP. The North South Road, as planned, would affect approximately 25 percent of the population, and the other Kapolei projects would affect the remaining 75 percent. As agreed by DOT and DLNR in a Memorandum of Agreement, DOT on March 14, 2001 made available funds in the amount of $250,000 for the initial five years of HCP implementation. These initial funds are being utilized (since approximately August 2001) by DLNR to manage and implement the HCP strategies. The MOA also stipulates that the subsequent 15 years will also be funded by DOT. An additional $750,000 will also be delegated to DLNR upon the approval of the HCP by the Board of Land and Natural Resources (the Hawaii Legislature, as appropriate) and the Governor’s release of the funds for a total not to exceed $1 million over a maximum period of 20 years.

DOT will also establish a contingency fund and has developed a process for third party developers ("Cooperators") to utilize the Sectional Take License through a Certificate of Inclusion. The Cooperators would pay into a contingency fund for the following purposes: 1) to finance unanticipated costs incurred by DLNR in the implementation of the HCP measures; and 2) to fund the management and monitoring of these "wild" populations beyond 20 years. The initial total amount of the Contingency Fund is $200,000. To ensure this fund, DOT will deposit the full $200,000 amount following the approval of the HCP.

SECTION I

Identify the geographic area encompassed by the plan; the ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan; and the endangered, threatened, proposed, and candidate species known or reasonably expected to be present in those ecosystems, natural communities, or habitat types in the plan area.

(a) Geographic Area Encompassed by the Plan

The location of the existing plants is at Kapolei, Ewa District, Oahu, Hawaii (Figure 1). The property is bounded on the north by Farrington Highway and H-1 Freeway, to the west by the Villages of Kapolei and Kapolei Golf Course, to the south and southeast by Ewa Villages and Kekioa Road, and to the east by diversified agricultural fields and saltwater mangrove land. It encompasses former sugar cane lands from approximately 60 feet above mean sea level ("AMSL") at Farrington Road up to 200 feet AMSL at the H-1 Freeway. The site also contains an existing Hawaiian Electric Company, Inc. ("HECO") powerline easement. Since 1999, BLNR has leased approximately 50 acres of the property to Alina Farms, Inc. and A. M. Enterprise, LLC on a month-to-month basis for crop farming. The leased parcels are known to have any A. marina on the premise. Kaluha Gulch and the Hauhau tributary, both intermittent ephemeral streams, traverse the property from the north to the southeast boundary. There are no known A. marina plants in the gulch and tributary.

New sighting population of Abadia servalii have been reported in the City and County of Honolulu Koko Crater Botanical Garden (Outplant Site #1), Kaneohe State Park (Outplant Site #2), Wild Site #1, and Honolulu National Wildlife Refuge (Outplant Site #2, Wild Site #2). The Koko Crater site is not considered a "wild site"; however, its value as a protected repository for the wild genetic stock of the Kapolei population.

Additional outplant wild sites will be established within the regions of the Kapolei population as well as other suitable areas on Oahu as described in Section 3, Strategy 1(b). Candidate sites include Diamond Head State Park, Islandaki Naval Reserve (at the Baldwin Tournament Facility), Kailua Trail, Kalaniana'ole North Trail and Sker Benge, Koko Kula Trail, Makaha Valley), area of Ysokobara Rosh and Makapuu Trail. These sites are described in Section 3, Strategy 1(b).

(b) Ecosystem, Natural Communities, or Habitat Types within the Plan Area

The Ewa Plain experiences light rainfall with a mean annual rainfall of about 20 inches per year, most of which occurs between the months of November and April. Based on more than 50 years of data collected at Oahu Sugar Company and its predecessor, Ewa Plantations, average annual daily minimum and maximum temperatures in the project area are 63 degrees F and 84 degrees F, respectively. On the Ewa Plain, the highest agricultural land and the low levels of evapotranspiration which occurs from scrub vegetation produces little cooling effect.
The project area was formerly cultivated as sugarcane land and is now characterized as a disturbed coastal dry ecosystem. The vegetation of the region is generally low land shrubs with a coastal fringe of koa trees. In the past several years the Kapolei property and surrounding lands have been taken out of sugarcane cultivation and put to other uses (e.g. urbanization, diversified agriculture, fallowed fields).

The vegetation in the region is largely determined by the history of cultivation (or disturbance) on each parcel of land. Noguchi (1990) has identified eight plant communities within the State's 1-200 acre project area: 1) Abandoned Cane Fields, 2) Fallowed Fields Mixed Herb Association, 3) Fallowed Fields Grassland Association, 4) Abandoned Fields, 5) Cultivated Fields, 6) Grasslands, 7) Gulch Association, and 8) Roadside Vegetation.

Within the Kapolei Parkway area, Child (2003, Appendix A), documents the dominant vegetation type as low xeric (buff) grass scrub.

Within the Kapolei property there are 80 to 100 plant species in common to former sugarcane lands (Appendixes A and B). Only two species are indigenous (Ehliopsis farinosa and Ixerianthus ovatifolius or cushion), two are probably indigenous (Malmea indica var. indica and Abalon nucsulciscii), and the rest are non-native (Hibiscus esculentus and Capparis deciduous). The vast majority of species are non-native.

As previously mentioned, Abalon nucsulciscii is not known to be present on the areas which are in crop cultivation.

The Kuau Gulch and Hauula Bluff gulch communities are distinct and are comparable in structure of the 18-1 Interstate Freeway. As stated above, past and recent surveys have found one A. nucsulciscii within or directly adjacent to the gulches (Bogatay 1979 and Child 1995, 1996, 1999).

(1c) The endangered, threatened, protected, and candidate species known to seasonally occur to occur in the ecosystem, natural communities, or habitat types in the plan area.

Except as noted above, A. nucsulciscii has been found throughout the natural communities and ecosystems of the Kapolei property.

Abalon nucsulciscii, also known by its Hawaiian name Lookaika, is a shrub in the Malvaceae Family (Mallow). With light green heart-shaped leaves and characteristic small dark red to maroon flowers, it is also commonly referred to as the red thorn. Photographs in Figure 2 show A. nucsulciscii in the Kapolei habitat.

Abalon nucsulciscii was formerly listed as an endangered species in 1986 and is now protected under the provisions of the Federal Endangered Species Act of 1973, as amended, and Chapter 156, Hawaii Revised Statutes (HRS) 1950, as amended. It is one of nine rare plant species included in the Local Plant Chapter Recovery Plan (US Fish and Wildlife Service, 1994).
Of the nine taxa described in the Land Recovery Plan, A. recens has a high probability of recovery due to its larger population size, resistance to some of the current threats, and the relative ease of propagation. The Land Recovery Plan does not describe the Kupolii population; the populations which are identified are on Kauai, Molokai, and Maui.

At the time of the Nagata survey in September 1996, 38 individuals were recorded in a reconnaissance survey covering 80 percent of the State property. After the unusually heavy rains of November 1996, Choy (1997) in a 100 percent survey of the area described by Nagata recorded 86 plants at approximately the same locations as Nagata. In December 1997 Nagata performed a detailed survey and count which was followed by precise mapping. The survey and count resulted in 87 plants. 86 on the subject property and one (1) plant at an off-site location on City and County of Honolulu property at Farmer Road adjacent to the southern boundary of the State property.

Additional plants were identified by Choy in 2004 on the City property. The plants are in four clusters (Clusters A, B, C, and D) and one additional plant of Cluster D was also identified (Figure 1). In October 2005, USFWS/DOFAW produced an updated map (Figure 3A) depicting the location of 16 new plant locations. The new plants occur in close proximity of a mature plant and fall within the known and mapped clusters.

Since the previous baseline year of 1997 the number of individuals on the State-owned property have fluctuated with rainfall levels and it is anticipated that the number of individuals will continue to be dynamic. Therefore, this HCP covers the entire population of A. recens on the State and City lands as depicted in Figure 2. To manage and quantify the development impacts, a baseline population number of 93 (revived in 2004 to include City lands) individuals has been assigned. This baseline of 93 individuals is differentiated from the approximate number of 502 currently existing plants. Table 1 describes the baseline distribution of A. recens.

Table 1. Baseline Population of A. recens on Kupolii, 1997 (Revised to include Cluster E, 2004)

<table>
<thead>
<tr>
<th>Cluster</th>
<th>No. of Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>19</td>
</tr>
<tr>
<td>B</td>
<td>14</td>
</tr>
<tr>
<td>C</td>
<td>61</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>93</td>
</tr>
</tbody>
</table>

Cluster A contains 10 individuals and is located at the southern end of the State property site. An existing dirt road situated in an east to west direction provides access to this cluster.

1 The Kupolii population is distributed on State and City lands.
Cluster B consists of 14 individuals located along the western boundary of the State property which is marked by a chain link fence. Individuals in this cluster are spread in a north-south direction and are accessed from the distal end near Cluster A at the northern end of the property.

Cluster C, the largest cluster consisting of 16 plants occurs in the general area of the HECU powerline easement and primarily to the east of the powerline easement. The cluster is accessed from mango tree Road which is situated in an east-west direction. Several land uses would affect Cluster C; therefore, these sub-areas identified as C-1, C-2 and C-3 have been designated.

<table>
<thead>
<tr>
<th>Sub-Area</th>
<th>No. of Plants</th>
<th>Land Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>15</td>
<td>North South Road</td>
</tr>
<tr>
<td>C-2</td>
<td>3</td>
<td>Orange Grove/Space Candidate</td>
</tr>
<tr>
<td>C-3</td>
<td>40</td>
<td>Residential/Other Urban use</td>
</tr>
<tr>
<td>TOTAL</td>
<td>61</td>
<td></td>
</tr>
</tbody>
</table>

Cluster D consisted of a single plant in the central area of the State site; however, this individual has not been seen since the initial recording.

The individuals in Cluster E are spread over an 81-acre area and occur as single plants, except at one location along a fence line at the property boundary and access roadway. At this location, there is a large, multi-crowned plant, a young single-crowned plant, and a seedling. Cluster E is accessed from the dirt road which leads to the Ewa Villages Golf Course Maintenance Facility. A segment of Kapolei Parkway and future urban uses are planned at this location.

At the time of the 1997 Nageswara survey, plants in the population were 1 to 3.5 feet in height and included juveniles and mature individuals. Approximately 10% of the population were taller than 3 feet, 20% were between 2 to 3 feet, and only 5% were between 1 to 2 feet. No seedlings or small plants were identified. In December 1997, 37% of the plants were flowering and/or fruiting (Nageswara 1997).

Present Status. Though naturaluscence and accidental take (1997 to 2003), the number of plants has declined to 20 to 50 plants (DLNR 2001); however, in 2001, DLNR moved 16 new plants in close proximity of existing mature plants (DLNR 2001). The actual number of plants is difficult to determine due to the dry conditions at Kapolei; plants which appear to be dead may possibly revive during the wet season (DLNR 2001).

Contributing to the decline of the Kapolei population was a January 2000 incident in which approximately four plants were uprooted/moved (by being plowed) and seedlings were killed (DLNR DFOA/WV, Cawary, personal communication).

**SECTION 2**

Describe the activities contemplated to be undertaken within the plan area with sufficient detail to allow the department to evaluate the impacts of the activities on the particular ecosystems, natural communities, or habitat types within the plan area that are the focus of the plan habitat types in the plan area.

*Description of activities to be undertaken within the plan area in sufficient detail*

The Kapolei projects include North South Road, a segment of Kapolei Parkway, University of Hawaii, West Oahu campus, Department of Hawaiian Home Lands residential homestead development, and unspecifed urban uses on the DLNR lands. The projects are shown in a Conceptual Land Use Plan in Figure 4. Land ownership is shown in Figure 3 and described in Table 3.

<table>
<thead>
<tr>
<th>Project</th>
<th>TSC/Number</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>North South Road**</td>
<td>234.5</td>
<td>33.1</td>
</tr>
<tr>
<td>Kapolei Eastside Road**</td>
<td>105.8</td>
<td>105.8</td>
</tr>
<tr>
<td>Kapolei West Road**</td>
<td>165.655</td>
<td>165.655</td>
</tr>
<tr>
<td>Kapolei Parkway Road**</td>
<td>165.655</td>
<td>165.655</td>
</tr>
<tr>
<td>Ewa Villages Golf Course Maintenance Facility**</td>
<td>31.953</td>
<td>31.953</td>
</tr>
<tr>
<td>Ewa Villages Golf Course Maintenance Facility**</td>
<td>201.754</td>
<td>201.754</td>
</tr>
<tr>
<td>Ewa Villages Golf Course Maintenance Facility**</td>
<td>190.414</td>
<td>190.414</td>
</tr>
<tr>
<td>Ewa Villages Golf Course Maintenance Facility**</td>
<td>45.995</td>
<td>45.995</td>
</tr>
</tbody>
</table>

*Approximate area (DOH). Information on mapping and sampling data comes from the Kapolei land development 1
**North South Road segment elevates from 30.30 to 39.30 feet above mean sea level. Includes approximately 0.5 mile of Kapolei Parkway.
***Includes a portion of the proposed 9 meter engineering of Kapolei Parkway. Does not include the 9 meter engineering of the 9 meter engineering of the False Hill.  The net area in DLNR will be approximately 201.754 acres.
The distribution of *A. monticola* on the Kapolei property, and more specifically, within the development parcels, is shown in Figure 6. Surveys conducted since 1995 have not identified *A. monticola* in Kapiolani and Harinahau Gulches (Nakata 1996, 1997, Char 1997, 2001, 2004 and U.S. Fish and Wildlife Service 2000), thus the HCP is not affected by activities proposed at either gulch location. The approximate number of individuals are described in Table 4 following the descriptions of the proposed projects.

**North South Road**

The North South Road, a new 1.9-km (1.2-mile) roadway, will traverse the Kapolei property and will provide regional access to the Interstate H-1 Freeway, connecting the Interstate Route H-1 ("H-1 Freeway") at the north end to a future segment of Kapolei Parkway (at the south end), a distance of approximately 3.6 km (2.2 miles). The alignment is adjacent to and toward the west of the corridor delineated by the existing HECI towers. The new roadway is designed with three vehicular lanes in each direction, a planting median, and sidewalks on both sides with an overall width of 816 feet.

The overall schedule for the North South Road began with the initial planning in 1994 and an anticipated completion in 2008:

- **Planning:** June 1994 to September 2001
- **Design:** Aug 1997 to Sept 2004
- **Construction:** Dec 2004 to Dec 2008

The North South Road construction is planned to be built in two phases:

- **Phase 1 (June 2004 - 2007):** Begins grading for six (6) lanes and drainage improvements; construction of three (3) highway lanes from Kapolei Parkway to H-1 Freeway.
- **Phase 2 (June 2005 - 2008):** Construction of additional three (3) lanes; construction of drainage detention basins, construction of intersections at Kapolei Parkway and Farrington Highway; construction of interchange at H-1 Freeway.

The Phase 1 component includes roadway and drainage grading and the construction of three of the six lanes on the Kapolei property. The impact to *A. monticola* is anticipated in Phase 1.

The Phase 2 components include the construction of the additional three lanes and intersections on the Kapolei property. The off-site construction of the interchange at the H-1 Freeway will also be completed in Phase 2. The interchange would provide an access to the Kapolei downtown area and the Leeward Coast. There are no known *A. monticola* within the area of the interchange, therefore,

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2 DOT will coordinate with the US Department of the Army Corps of Engineers on matters related to Kakaako and Furnace Gulches.
A staging area and construction transit area approximately 50 feet to 75 feet wide along the west boundary of the North South Road corridor is required. However, no known plants are present along this strip.

As a federal aid highway, the North South Road is undergoing a National Environmental Policy Act ("NEPA") review and Endangered Species Act, Section 7 consultation. The subject HCP will be submitted to USFWS as a component of the required biological assessment for the Section 7 process.

Kapolei Parkway Segment

The Kapolei Parkway, a new 6-lane major collector roadway, will traverse the City's Eva Villages property and will provide alternate regional access to the H-1 Freeway, connecting the North South Road at the north end to Bantan Road at the south end, a distance of approximately 9.7 miles. The new roadway is designed with three vehicular lanes in each direction, a planting median, and sidewalks on one side and a multilevel (pedestrian and bicycle) pathway on the other side with an overall width of 110 feet. The project will include underground utilities (including water, sanitary sewers, drainage, and communication systems), storm drainage system, street lighting system, and landscape irrigation system.

The overall schedule for this segment of Kapolei Parkway began with initial planning in 1994, and the City anticipates completion by 2008:

- **Planning:** June 1994 to September 2004
- **Design:** December 2000 to December 2005
- **Construction:** June 2006 to December 2008

The Kapolei Parkway roadway is planned for construction in two phases:

1. **Phase 1 (mid 2006 - 2007):** Main grading for an 8-lane roadway (construction of three (3) major travel lanes from North South Road to Bantan Road).
2. **Phase 2 (late 2007 - 2008):** Construction of additional three (3) minor lanes. The construction of these lanes is to be coordinated with completion of the North South Road.

The Phase 1 components include roadway and drainage grading, the construction of three (3) major road lanes, and a portion of the underground utilities, storm drainage system, street lighting system, and landscape irrigation system on the Eva Villages property. The impact on the property is anticipated in Phase 1.

The Phase 2 components include the construction of the additional three lanes and the balance of the underground utilities, storm drainage system, street lighting system, and landscape irrigation system on the Eva Villages property.

The purpose of this project is to provide an alternate regional access to the H-1 Freeway. The project will also provide an alternative route for commuters traveling between the north end of the city and the south end, reducing congestion on the existing North South Road.

The City is planning to schedule construction of an additional three (3) lanes for the Kapolei Parkway segment from the Bantan Road intersection (at the north end) to its connection to the existing Kapolei Parkway in the vicinity of the H-1 Freeway (at the south end) in coordination with the above Phase 2 segment and North South Road completion. There will be no expansion of the existing Kapolei Parkway.

University of Hawaii West Oahu

In September 2002, the UH Board of Regents conveyed to the University a right-of-way to the property for planning purposes. The UH West Oahu property is bounded by the proposed North South Road in the east, Farrington Highway to the north, the Kapolei Golf Course and Village of Kapolei to the west, and Dillingham Blvd. to the south. The Kaha Gulch and Hauula Gulch traverse this parcel.

At the present time, portions of the UH West Oahu property are being leased for agricultural crop farming under a 40-year lease. A portion of the farm is currently used for cattle grazing. The University is planning to construct a new 50-acre property (230 acres) to be used as a research and development facility. The land is located in the southern portion of the property, close to the proposed North South Road extension.

The UH West Oahu will be a major educational facility on Oahu, primarily serving the Leeward and Central Oahu regions. The University is currently exploring options for the development of the campus and is preparing a plan for its eventual construction. This plan includes a 50-acre research and development facility to be located within the 230-acre parcel. The University is currently in the process of finalizing the design and construction plans for this facility.

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In November 2002, DLNR granted DHHL a right-of-way to approximately 200 acres at the Kapolei property and commenced the process to transfer these parcels to DHHL. The two parcels are to the west of the proposed North-South Road and at the northern and southern points of the Kapolei property. The southern property, Parcel 3, is approximately 49 acres and located between Farrington Highway and the H-1 Freeway. Directly to the north is the proposed UHWO southern boundary. Kapolei Golf Course and the Village of Kapolei are to the west with the North-South Road to the east and DLNR lands beyond that. A portion of Parcel 18B will require future subdivision for the Kapolei Parkway extension in an east-west orientation. This latter subdivision will border the property into two non-contiguous parcels.

The mission of DHHL is to develop and deliver benefit to qualified Native Hawaiians pursuant to the Hawaiian Homelands Commission Act. The acquisition of these parcels will allow DHHL to plan and develop approximately 1,000 residential homesteads and potentially some commercial and community facility uses to serve the new subdivision over a 6 to 10 year period from 2006-2016. Consequently, the first increment is targeted to be completed in 2006. Ownership by DHHL and development of these uses have been described in the EIS for the East Kapolei Master Plan.

All Race: necessary to present on DHHL’s Parcel 18B (19 acres) at Kapolei A and B. Based on the base population, 38,000 individuals comprise Cluster A and 14 individuals comprise Cluster B. The development sequence will affect Cluster B initially followed by Cluster A.

Department of Land and Natural Resources

The remaining unassigned parcels (formerly part of the East Kapolei Master Plan) total approximately 600 acres in five parcels; the parcels are now under the ownership of the DLNR Land Division and to the east of the proposed North-South Road and the north of Farrington Highway.

The Environmental Impact Statement for the East Kapolei Master Plan designates urban uses including residential, public schools, parks, roads, etc. as well as roadways and open space areas on these parcels which would serve as drainage detention basins. The ultimate uses of these lands will be determined in the future when a development proposal is again proposed by the State or other governmental entity.

More than half of the A area in Cluster C occurs on the DLNR lands.

Kapolei Projects Conceptual Development Schedule

The commencement of construction for the North-South Road is planned for late 2004 with completion in 2008. The other Kapolei projects are in the early stages of planning and schedules have not yet been determined. Thus, Table 4 below is conceptual and may be changed. The impact to the base population of A area is assumed over 20 years as described in this HCP. However, even if development plans are delayed, the HCP strategies and mitigation measures will be implemented in its entirety. Moreover, in accordance with the expiration date of the incidental take license, any remaining site plans after July 31, 2002, will remain within the Kapolei property.

### Table 4: Conceptual Development Timing and Impacts to Plant Clusters

<table>
<thead>
<tr>
<th>Development Plan</th>
<th>Cluster</th>
<th>No. of Plants*</th>
<th>Land Use (Conceptually)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 North-South Road (Phase 1)</td>
<td>C</td>
<td>11-7</td>
<td>Residential Community, Farm, Education</td>
</tr>
<tr>
<td>2006 North-South Road (Phase 2)</td>
<td>B</td>
<td>18</td>
<td>Residential Community, Farm, Education</td>
</tr>
<tr>
<td>2006-2010 DLNR (Phase 1)</td>
<td>E</td>
<td>3</td>
<td>Residential Community, Farm, Education</td>
</tr>
<tr>
<td>2006-2010 DLNR (Phase 2)</td>
<td>E</td>
<td>4</td>
<td>Residential Community, Farm, Education</td>
</tr>
<tr>
<td>2006-2010 DLNR (Phase 3)</td>
<td>E</td>
<td>4</td>
<td>Residential Community, Farm, Education</td>
</tr>
<tr>
<td>2006-2010 DLNR (Phase 4)</td>
<td>E</td>
<td>4</td>
<td>Residential Community, Farm, Education</td>
</tr>
<tr>
<td>2006-2010 DLNR (Phase 5)</td>
<td>E</td>
<td>4</td>
<td>Residential Community, Farm, Education</td>
</tr>
</tbody>
</table>

* Development plans are conceptual and development schedules have yet to be determined at this time.
** The number of plants is intended to be based on the base population of 69,300 plants.
*** Future uses may include residential development by DHHL.
**** Sub-population includes plants within the DLNR non-consumptive resource area.
***** Sub-population is proposed by DLNR for the East Kapolei Master Plan.

### Evaluation of the Impact of the Activities on the Plant Communities, Natural Communities, or Habitat Types within the Plan Area

The ultimate development of the Kapolei projects would result in incidental take of all A subunits and the plants are unlikely to survive in their current locations. Most of the non-native plant community on the proposed development sites will also be heavily impacted.

In anticipation of the impact, an Invasive Management Program has been implemented through a cooperative arrangement between DLNR and Biscuit, and subsequently DOT, as described in Section 3, Strategy 1. Under Strategy 1, the following have been accomplished: (1) a site-specific control plan and a management plan have been completed; (2) a field program to control the non-native plant community to be implemented; (3) a monitoring program to be initiated.

1. Invasive plant species, including but not limited to Flora and fauna predominant on the DLNR lands, will be controlled through a combination of pre-emptive control and follow-up residual control. 2. The non-native plant community within the proposed development sites will be removed as part of the project.
SECTION 3

Identify the steps that will be taken to minimize and mitigate all negative impacts, including without limitation the impact of any authorized incidental take, with consideration of the full range of the species on the island so that cumulative impacts associated with the take can be adequately assessed and the funding that will be available to implement those steps.

Described below are the details of the core elements of this HCP, including the mitigative steps and strategies for the impacts to Anahola muscicei on the Kapeloi property.

(4k) Full range of the species

Anahola muscicei is uncommon and local in dry forests between elevations 200-520 meters on Kauai, East Maui, and Hawaii (Wagner 1999). On Oahu, a collection (Chu 81, 092, BM35) from an abandoned cattle ranch at Nahe Point, Ewa, was made in 1986 and believed to represent an escape from cultivation. At that time all cultivated plants on Oahu were descended from plants derived from individuals propagated on the island of Hawaii. Difficulties in leaf morphology of progeny from this plant suggest that the Nahe Point plant may represent a distinct population (USFWS 1999).

A single individual plant has recently been documented on Nanao property at Loalalii (Kerber 1998 and Miyashiro 2001, personal communication). A. muscicei is also present in several herbarium collections on Oahu including the University of Hawaii Herbarium, the Honolulu Botanical Garden, and Amy D. Greenwell Botanical Garden in Kaaawa on South Kauai.

A database search by the Hawaiian Natural Heritage Program for A. muscicei on Oahu resulted in the subject Kapeloi population only.

The relationship of Kapeloi plants and Island of Hawaii plants is unknown at this time. Prior to the discovery of the Kapeloi population, the area was not commonly known as a habitat for A. muscicei. Thus, DLNR botanists believe that the abundance and spatial distribution suggest that the Kapeloi plants are probably natural remnants of a once more extensive Oahu population (current DLNR, personal communication) and not an escape from cultivation previously theorized. Moreover, the Kapeloi population is the larger of the two known populations and accounts for approximately 99 percent of the known wild plants on Oahu (USFWS, L. Gibbons).

(16) Steps and strategies that will be taken to minimize and mitigate all negative impacts, including without limitation the impact of any authorized incidental take.

The strategies under consideration in this Habitat Conservation Plan include off-site and on-site measures which would be implemented, as listed in Table 3.
### Table 5: Strategies to Assess and Mitigate the Development Impacts on Abalosia monnieri at Kapolei

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Mitigation Steps and Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Funding for the implementation of the HCP</td>
</tr>
<tr>
<td>3</td>
<td>Develop and conduct to recommend planting strategy.</td>
</tr>
<tr>
<td>4</td>
<td>Establish new populations at forest off-site locations.</td>
</tr>
<tr>
<td>5</td>
<td>Long-term protection and maintenance of potential new forest population.</td>
</tr>
<tr>
<td>6</td>
<td>Appropriate research.</td>
</tr>
<tr>
<td>7</td>
<td>Kapolei population strategies.</td>
</tr>
</tbody>
</table>

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**Strategy (1) Interim Management Program (October 1998 to October 2001)**

Through funding provided in 1998 by the Housing and Community Development Corporation of Hawaii (HCDCH), HCDCH and DLNR established an agreement to implement a pre-construction period interim Management Program to test the viability of establishing Abalosia monnieri at two off-site locations on Oahu.

On March 14, 2001, DOT delegated the expenditure of $525,000 to DLNR for the implementation of the HCP strategies for Years 1 through 5. Funds became available in August 2001 and are subsequently being used by DLNR to complete Strategy (1) (Interim Management Program) of the HCP and to transition to HCP implementation to accomplish the overall HCP implementation strategies (described below).

The preliminary results of the Interim Program indicate that propagation of the species from cuttings and seed is highly successful in the nursery environment. Outplanting to off-site locations has also been successful in the first year. The **Interim Management Report for Abalosia monnieri (DLNR 2001)** and the Final Interim Management Report for Abalosia monnieri (DLNR 2003) are attached as Appendix F and Appendix G.

The Scope of Services of the Interim Management Program include the following tasks:

**Task 1:** Maintain in-situ population through monitoring, maintenance, and security (fire protection).

Kapolei Kapoeli plants have been marked with permanent stakes and mapped in a GIS layer. The existing plants are being maintained by weeding around them, and the application of herbicide, pesticide, and fertilizer, as necessary. A fire management strategy consisting for the following strategies is being implemented to ensure that the plants are not accidentally destroyed:

- Identification of fire fighting resources available near the Kapolei population;
- Provide information to fire stations to assist in protecting T. monnieri from fire;
- Identification of water resources near the Kapolei population.

The details of the fire management strategies are described in the Final Interim Management Report for Abalosia monnieri (DLNR, DOFAW 2003, Appendix G).

**Task 2:** Propagate a total representation of plants through seeds and cuttings from the Kapolei Abalosia monnieri population. These plants will be used to maintain genetic representation of stock and provide stock for augmenting purposes. Work will be done at the existing State DLNR, Division of Forestry and Wildlife (DOFAW) nurseries.
All the known Kapalai population plants have been propagated through cuttings resulting in 630 first generation progeny from 63 in situ individuals. In addition, 210 seedlings have been produced from seed collected from the first generation nursery plants (grown from cuttings). Additional seed have been distributed to Lyon Arboretum, the National Seed Storage Laboratory in Fort Collins, Colorado, and the Pahole Rare Plant Facility.

Task J. Establish non-invasive populations of Hulahau meyeri in appropriate habitat to allow for natural establishment and long-term viability. Each outplanted site was planned with a representative sub-sample of the Kapalai population and each individual plant has been tagged with a permanent metal tag.

Three outplanted populations of Hulahau meyeri have been initiated.

**Outplant Site #1: Koko Crater Botanical Garden (Figure 7)**

Through an agreement with DLNR DOFAW, the City and County of Honolulu Koko Crater Botanical Garden provided a 400' x 300' x 50,000 sf site for the outplanted planting. In November 2000, 140 Hulahau meyeri were planted in the 10,000 sf site, representing two complete sets of each of the original Kapalai plants. The outplanted plot is in a public display area supported with drip irrigation. Hence, plants are lush and thriving. Koko Crater Botanical Garden staff will provide the long term care of these plants and will be propagating additional meyeri from materials taken from these plants. Although this site is not being considered as a "wild site" in intent it is a living genetic repository of the full Kapalai population. DLNR will continue to coordinate the management regime (e.g. irrigation requirements, etc.) with Koko Crater Botanical Garden.

The outplant site is within a public garden setting and located in close proximity of an individual of another endangered species (A. avensis) raising concerns about hybridization. Therefore, propagules from the Koko Crater outplanting will be limited to cuttings. Recent observations of this site indicate flowering, fruiting, and setting of seeds (personal communication, N. Singh). The outplanting will be monitored for seedling recruitment, however due to potential for hybridization with A. avensis, propagules for outplanting will be limited to cuttings.

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*The baseline number of in situ plants at the Kapalai population numbered 93 individuals; however, through natural means, the number had declined to 63 individuals at the time Task J was implemented, resulting in a genetic representation of only those existing at that time. Propagation of any subsequent "new" in situ plants (not including the plants on Koko property) which would constitute parental stock is also being undertaken by DLNR.*
Outplant Site #2, Kona Point State Park (Wild Site #1) (Figure 8)

The Kona Point outplant site was started in April 2001. The land is under the jurisdiction of the DLNR, Division of State Parks (TMR: 6-9-01-4).

The approximately 3 acre outplanting site was established with two distinct planting areas separated by a four-wheel drive road. The site is completely protected from four-wheel drive vehicles by a rock barrier along the dirt road forming the outplanting site. Site preparation included clearing the non-native brush and grass with weed cutters and by hand tools and seeding the area with bermuda to prevent regrowth. A total of 142 wild flowers were planted in the Kona Point outplanting site. In addition, 20 native species have been planted to create a coastal sand community.

The plants were irrigated at the site to promote their establishment and to encourage the production of a maximum amount of seed to allow the build-up of the seed bank and natural establishment of seedlings. The survival rate for plants at this site has been 99%. The 142 plants at this site represent a total of 44 of the original 90 species. Two of these seedings have grown naturally from seed produced by plants outplanted at this site. These seedlings have grown large enough to be considered part of this population.

The DLNR received permission from the U.S. Air Force to tap into the 4-inch water main that runs adjacent to the outplanting site allowing the construction of a complete irrigation system and including a pressurized steel water tank with a capacity of approximately 1,000 gallons to provide a water reserve for irrigating the plants. This tank is necessary because the 4-inch water main is pressurized only two days a week for 4 hours per day.

The threats to the Kona Point outplanting site include the rapid growth of weeds and silt. This site was established in an area with deep soil that was dominated by grasses (Distichlis spicata) and sea grass (Zostera capricorni). DLNR staff have had difficulty keeping up with the weed threat presented by these species and others at this outplanting site. To combat weeds in the outplanting site, DLNR has used a variety of labor including regular Native Area Reserve System employees, temporary workers such as the Emergency Environmental Workforce, and volunteers.

The other major threat to this outplanting site is fire. The fire strategy and fire fighting resources includes the installed water tank, the installed 3-inch outlet to allow fire engine backup near the road, and the planting of native plants along the perimeter of the outplanting site to serve as a fire break.

On August 20, 2003, a brush fire started by a vehicle about 5 miles away burned a total of 160 acres along the coastal flats up to the nearby Kealakeka Game.
Management Area at about 1,100 feet elevation. This fire started late at night and
was fueled by winds of 25 to 35 mph and burned to the edge of the outplanting
site and beyond. The fire moved so quickly that Hawaii Fire Department
engine companies were unable to engage the fire near the ignition point or near
the outplanting site resulting in a burn of approximately 50 percent of the 3-acre
outplanting site. The effects of the fire on the Ahalanui memorial plants at the site
are unknown at this time. An assessment will be made when the rainy season
occurs and there is sufficient moisture for growth.

The plants along the edge were affected by the flames but not completely consumed.
It is possible many of these Ahalanui memorial plants will survive. The fire did
burn many of the other native species planted in the area to serve as a fuel break
along the front of the outplanting site. This fire would have been more damaging
if these plants had not been in place. These fuel break plants will need to be replaced.
The fire did destroy all irrigation pipes in the area and will need replacement. The
lesson learned from this experience is that the fuel break plantings are perhaps,
the most useful part of the fire strategy. The fuel break portion of the fire management
strategy needs to be replanted and developed further with a wider buffer of fire
resistant species established to encompass the entire outplanting site.

Outplant Site P3: Humuhulu Unit of the Pearl Harbor National Wildlife Refuge
(PHNR Site #3) (Figures 9)

A third outplanting site has been developed at the Humuhulu Unit of the US Fish
and Wildlife Service Pearl Harbor National Wildlife Refuge which borders the West
Qch of Pearl Harbor (TMK 9-1-17). USFWS has a cooperative agreement with the
Navy to manage this site as a refuge in perpetuity. This 37 acre unit is mostly a fresh
water wetland managed for a variety of endangered water birds. The entire
Humuhulu Unit is enclosed in an eight-foot chain link fence that provides predator
control for the birds and security for the plants. DLNR DOPAW has selected and
planted an upland area within this Unit and installed an irrigation system to assist
with the initial establishment of plants.

There are two separate areas being used for outplanting within the refuge. The first
consists of a narrow strip, approximately 20 by 600 feet, while the second site is
approximately 60 by 300 feet. The first planting commenced on March 15, 2002 in
the 20 by 600 foot site. Work at the second location began in January 2003. Both
locations are on an irrigation system and are managed entirely by DLNR DOPAW
staff.

At this time the planting includes a total of 61 Ahalanui memorial plants at the
Humuhulu Unit with a survival rate of 95 percent of the outplants. Plants from
cuttings from 21 of the original East Kapolei plants are represented here. In addition,
21 seedlings of known parentage and 10 seedlings of unknown parentage that were
removed from the East Kapolei population in the spring of 2002 have been planted
here.
HABITAT CONSERVATION PLAN FOR ABURMAMANDA AT KAPOLI

A small number of the seedlings produced in the Kapoli population (approximately 60%) during the spring of 2002 were left bare and subsequently perished. These plants produced from seed were also planted at Hamoudi. The amount of area covered by this replanting site is approximately 9 acres. There is sufficient area to add more plants to this site.

The fire threat at this site is minimal. The eight-foot chain link fence provides a barrier to most of the perimeter ignition sources. A buffer of approximately 6 feet of bare ground is in place just inside most of the perimeter fence of this unit to serve as a barrier to protection of the endangered water birds. This buffer strip also serves as a firebreak to the neighboring site. The position of the fence that doesn’t have this buffer has fire water mache just inside the fence. The fire management strategy for this site is to ensure that this buffer strip remains in place.

Task 4: Research the biology of the species and determine seed storage requirements, salt and salinity influence, and the best herbicide control methods.

Germination research has been conducted to determine success of controlling ants and grains and duss ha have been tested on a few plants to determine toxicity. Seed have been stored in an appropriate seed tank facility. Additional research is discussed under Strategy 6 below.

Task 5: Provide partial funding for the construction of a low-elevation greenhouse dedicated to growing A. montevidii and other threatened and endangered plant species on Oahu. This greenhouse would serve as a long-term greenhouse, to be owned and operated by the Division of Forestry and Wildlife, for low elevation threatened and endangered plant species on Oahu, including A. montevidii from the Kapoli population for the duration of HCP implementation.

The construction of the Dillingham Greenhouse by DLNR DOFAW has been completed (see Figure 9).

A 6,000 square foot nursery dedicated to the propagation of Ahulani montevidii and other threatened and endangered plant species on Oahu is located near the base of the Knoll Trail head, just behind the western end of Dillingham Airfield in Mokuleia. The land falls under the control of the DLNR Land Division and is in the process of being transferred to DOFAW. The construction included the installation of the water and electrical systems. The greenhouse is 130 feet long by 60 feet wide by 12 feet tall. It is divided into an upper and a lower section along the entire length. All propagation of A. montevidii is now at this new facility.

Table 6: Funding Sources for the Habitat Conservation Plan (2001 to 2011)

<table>
<thead>
<tr>
<th>HCP Year / Time Period</th>
<th>Cost (in 2010 Dollars)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Invasive Management Project</td>
<td>$67,970 (DOFAW only has been allocated)</td>
<td>Office of Economic Development</td>
</tr>
<tr>
<td>December 1998 - October 2001</td>
<td></td>
<td></td>
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<tr>
<td>Year 1 to Year 5</td>
<td></td>
<td></td>
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<tr>
<td>August 1, 2000 - July 31, 2004</td>
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<td></td>
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<tr>
<td>Year 6 to Year 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 1, 2005 - July 31, 2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) HCP Mitigation Project and Deferred Liability</td>
<td>$106,000</td>
<td>DOFAW</td>
</tr>
<tr>
<td>Year 11 to Year 20</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) Project 20, Management of Deer</td>
<td>$1,068,000</td>
<td>DOFAW</td>
</tr>
<tr>
<td></td>
<td>(2012 - 2017)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) Project 20, Management of Deer</td>
<td>$67,970</td>
<td>DOFAW</td>
</tr>
<tr>
<td></td>
<td>Deferred Liability for 2012</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) HCP Mitigation Fund and Deferred Liability</td>
<td>$359,000</td>
<td>DOFAW</td>
</tr>
<tr>
<td>(2001 - 2011)</td>
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<tr>
<td></td>
<td>(DOFAW only has been allocated)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) HCP Mitigation Fund and Deferred Liability</td>
<td>$156,000</td>
<td>DOFAW</td>
</tr>
<tr>
<td>(2005 - 2011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) HCP Mitigation Fund and Deferred Liability</td>
<td>$106,000</td>
<td>DOFAW</td>
</tr>
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<td></td>
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</tbody>
</table>
Funding for Years 1-20 of HCP Implementation

The provision for the establishment of the endangered species trust fund to be administered by DLNR is described in HRS Chapter 148D-31. It states “the funds shall be held separate and apart from all other monies, funds, and accounts in the state treasury, provided the monies received as deposits or contributions from private sources shall be deposited and accounted for in accordance with the conditions established by the agency or person making the contribution. Earnings on the investment of the assets of the fund shall become part of the fund. Any balance in the fund at the end of a fiscal year shall be carried forward to the next fiscal year.”

DOT intends to delegate a total of $1,000,000 for implementation of the HCP over a 20-year period from August 1, 2001 to July 31, 2021.

Constituency Fund - Funding After the 20th Year

Funding is provided for unanticipated events and for the management of three wild sites in the years following the 20-year HCP period.

DOT will establish a $200,000 contingency fund for the following purposes: 1) to finance unanticipated costs incurred by DLNR in the implementation of the HCP; and 2) to fund the management and monitoring of three “wild” populations beyond 20 years. The initial $200,000 deposit by DOT in 2005 will be augmented by Cooperators in the Incidental Take License, which have filed a Certificate of Inclusion with DOT.

Certificate of Inclusion

A Certificate of Inclusion would indicate the following:

a. DOT will be the holder of the Incidental Take License (“ITL”)
b. Other agencies who propose to develop projects on the Kapoho property may have the protection of the ITL by obtaining a fully-executed Certificate of Inclusion and filing this document with DLNR.
c. The DOT, in consultation with DLNR, may require that other agencies contribute their various resources in order to sustain the mitigation effort of this HCP.

Memorandum of Agreement

DOT and DLNR have prepared a Memorandum of Agreement (“MOA”) to implement the HCP. The MOA describes and states the following:

1. On August 1, 2001, DLNR shall implement the tasks set forth in Exhibit A, attached hereto and incorporated herein. DLNR shall provide reasonable safeguards to assure the existence of at least three (3) “wild” Hawaiian monk seal populations in appropriate protected habitats.

2. These populations will be maintained and managed beginning on the 1st day of August, 2001, and ending on the 31st day of July, 2021 as until all of the “success criteria” of the HCP has been accomplished.

3. DOT has delegated the expenditure of $250,000 from Act 139, SLH 1992, Item C0023, as amended by Act 116, SLH 1998, North South Road, Kapoho Parkway to Intrastate Route H-1, Oahu, to DLNR for the purpose of implementing mitigation strategies for the endangered Hawaiian monk seals, thereby incurring funds to finance the HCP mitigative strategies over its first five years.

4. DOT shall also allocate to DLNR an additional lump sum amount of $350,000, which is intended to provide adequate funding for a period of fifteen (15) years from August 1, 2006. The precise amount needed to finance the mitigation effort will be estimated by DLNR and approved by DOT. The estimate shall not exceed $250,000 for 5 years, and funding will be used specifically to cover the expenses of DLNR, which relate to the mitigation of impacts to the Kapoho Hawaiian monk seal. Interest earned on the funding, as allocated to DLNR, shall be retained by DLNR, be treated in nature as a mitigation beyond the terms of the HCP, and be utilized in accordance with the purposes of the HCP. If a portion of the funding is unexpended due to an early termination of this MOA or the HCP, such funding shall be returned to DOT.

DOT shall also allocate to DLNR an additional lump sum of $200,000 to serve as a "contingency fund", available over the terms of the HCP. The contingency fund shall be used for emergency response, site development costs or other unanticipated expenses required to fulfill the purposes of the HCP. The contingency fund is subject to legislative appropriation.

All funding directly or indirectly transferred by DOT to DLNR shall be retained by DLNR, for the planned recovery of the Hawaiian monk seal, until the "success criteria" is fully attained. If it is determined that all of the “success criteria” have been satisfactorily accomplished, the unexpended funds at the date of the determination, shall be returned to DOT.

In the event that additional funds for continued implementation of the HCP are needed, the DOT will seek alternative funding sources, including, but not limited to, transfers from the project’s construction budget, participation by other State departments, and a separate legislative appropriation.

5. The MOA shall be null and void if the Board of Land and Natural Resources (or the State Legislature, as necessary) does not approve the HCP for the Hawaiian monk seal in Kapoho.

6. The MOA may be terminated at any time by written consent of the parties to this agreement and any unexpended funds shall be returned to DOT.

7. The MOA may be amended at any time by written consent of the parties to this agreement.
The implementation of the soil nutrient management system in Table 8. The table shows various strategies for nutrient management, including:

<table>
<thead>
<tr>
<th>Source</th>
<th>Application</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source A</td>
<td>Application 1</td>
<td>Description 1</td>
</tr>
<tr>
<td>Source B</td>
<td>Application 2</td>
<td>Description 2</td>
</tr>
<tr>
<td>Source C</td>
<td>Application 3</td>
<td>Description 3</td>
</tr>
</tbody>
</table>

The table provides a comprehensive overview of different strategies for nutrient management, highlighting the effectiveness and applicability of each approach.
The HCP outlines a strategy to take cuttings and collect seeds from the existing, donor monoculture plants at the Kapa'au property prior to their removal and to use these materials to: 1) maintain genetic representation of the original population by growing cuttings in nurseries and placing seeds in seed storage facilities; and 2) to establish three new wild populations in protected areas elsewhere on Oahu.

Described below are the following: 1) Criteria for wild site selection, and 2) Candidate sites for outsourcing.

### 4.3. Criteria for Wild Site Selection

Wild sites for A. merrillii re-introduction are generally considered to be an area where the species, after initial planting, with the support of temporary active management measures (e.g., irrigation, control of threats, etc.), will become self-sustaining and will naturally reproduce.

To establish criteria for site selection appropriate candidates on Oahu for A. merrillii a brief summary description of the extant populations on Lanai and Maui was made. The physical characteristics, including vegetation type, plant communities, soils, elevation, rainfall, overall site characteristics, and identified threats were analyzed.

These sites are at Kaaawa Point and Pau Mahahoa on Lanai and Kaliikai Gulch and Puna Kalii on Maui. Table 9 summarizes the findings and a preliminary analysis of the findings is summarized below.

### Table 9: Summary description of extant Lanai and Maui populations of A. merrillii maruhana

<table>
<thead>
<tr>
<th>Site</th>
<th>Site Characteristics</th>
<th>Vegetation type</th>
<th>Plant communities</th>
<th>Site type</th>
<th>Elevations A sea level</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaaawa Point</td>
<td>Species is scattered throughout the area, often grown on slopes or ridges.</td>
<td>Growing in (10) to (30) ft, scattered sites in rough, rocky areas</td>
<td>Mostly sunny, lowting to moderate winds</td>
<td>Well-drained, deep, rich soils</td>
<td>20-25 inches of rain annually</td>
<td>Few</td>
</tr>
<tr>
<td>Pau Mahahoa</td>
<td>Species is found in the five ft to seven ft range along the leeward side of the island.</td>
<td>Growing in (6) to (7) ft, well-drained areas</td>
<td>Mostly sunny, lowting to moderate winds</td>
<td>Well-drained, deep, rich soils</td>
<td>30-35 inches of rain annually</td>
<td>Few</td>
</tr>
</tbody>
</table>

### Table 10: Preliminary analysis of physical characteristics of extant Lanai and Maui populations

<table>
<thead>
<tr>
<th>Site Characteristics</th>
<th>Vegetation type</th>
<th>Plant communities</th>
<th>Soil</th>
<th>Elevations A sea level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowland rainforest</td>
<td>Growing in (10) to (30) ft, scattered sites in rough, rocky areas</td>
<td>Mostly sunny, lowting to moderate winds</td>
<td>Well-drained, deep, rich soils</td>
<td>20-25 inches of rain annually</td>
</tr>
<tr>
<td>Hawaiian rainforest</td>
<td>Growing in (6) to (7) ft, well-drained areas</td>
<td>Mostly sunny, lowting to moderate winds</td>
<td>Well-drained, deep, rich soils</td>
<td>30-35 inches of rain annually</td>
</tr>
</tbody>
</table>

In addition, the following set of guidelines for re-introduction from the World Conservation Union:

**Choice of re-introduction site and type**

- Sites should be within the historic range of the species. For a re-introduction, there should be a nonviable population to prevent downspreading, social disruption and invasions of alien species.
terrestrial Conservation Plan for the Kawai i Island Geese. In some circumstances, a re-introduction may have to be made into an area which is already under the management of the species' former natural habitat and escape.

- An introduction outside its historical range should be undertaken only as a last resort when no opportunity for re-introduction into the original site or range exist and only when a significant contribution to the conservation of the species will result.

- The re-introduction area should have ensured long-term protection (whether formal or otherwise).

Evaluation of re-introduction site

- Availability of suitable habitat: a re-introduction should only take place where the habitat and landscape requirements of the species are satisfied, and likely to be similarly for the foreseeable future. The possibility of natural habitat change must be considered. Likewise, changes in the legal, political or cultural environment since species extinction needs to be assessed and evaluated as a possible constraint. The area should have sufficient carrying capacity to sustain growth of the re-introduced population and support a viable (self-sustaining) population in the long run.

- Identification and elimination, or reduction to a sufficient level, of previous causes of decline: could include diseases, over-hunting, over-collection, pollution, poisoning, competition with or predation by introduced species. Habitat quality, adverse effects of earlier research or management programs, competition with domestic livestock, which may be seasonal. Where the release site has undergone substantial degradation caused by human activity, a habitat restoration program should be initiated before the re-introduction is carried out.

[End: World Conservation Union text]

4. Candidate Sites

Three new populations of A. merriami have been initiated and are tentatively expected to persist. As evaluated by the terrestrial propagation by DLNR in the Internet Management Program (Project 13), plants grown in cuttings and from the in situ Kaepani population thrive and produce fruit and viable seed under nursery conditions. The results of the Echo Radiator Botanical Garden (Outplant Site #1), Kauai Point State Park (Outplant Site #2 / Wild Site #1), and Honolulu National Wildlife Refuge (Outplant Site #3 / Wild Site #2) will provide critical information for the selection of additional candidate Wild Sites. It is anticipated that those viable wild sites will be determined from planting at several (e.g. more than three) outplant sites. It is intended to ensure the long-term survival of this HCP, therefore, additional appropriate locations will be pursued and planted while monitoring the sites already planted.

DLNR, DOFAW, ESRC, and DOT have had considerable discussion since 1997 on the present (2002) in evaluating potential outplant (or refugia) sites. Trials at several sites for wild site viability have been initiated and have resulted in outplanting at two sites, Kauai Point State Park and the Honolulu Unit of the Pearl Harbor National Wildlife Refuge.

These and each future outplanting will require active management for up to 5 years period to before a determination is made on success or failure. Additional sites will continue to be pursued while existing sites are monitored, to yield three successful wild sites.

The discussions for the selection of additional wild sites include the following priority candidate site and other possible sites:

1. Priority Candidate Site
   - Diamond Head State Monument (Approved for outplanting by DLNR Division of State Parks)

2. Other Possible Sites
   - Hoomaluhia Botanical Garden (The Nature Conservancy)
   - Kalalau (Herschel Baker's Point Naval Air Station) Northern Tip and South Range
   - Kauai Kai (near Makua Valley)
   - Kekaha Trail area (State DLNR) (Test planted by DOFAW)
   - Lualualei Naval Reserve
   - Makapuu Head
   - Yokohama Beach (molokai area)

The candidate site locations are shown in Figure 10 and Table 11 summarizes the sites which have been considered as candidate outplanting sites. The physical site characteristics, threats such as invasive weeds and the potential for fire, and land ownership and availability have been assessed to determine the suitability of each site as a permanent habitat for A. merriami.
### Table 11: Candidate sites for exploring of biological monitoring

<table>
<thead>
<tr>
<th>Site Name (Taleem)</th>
<th>Characterization</th>
<th>Key Features</th>
<th>Key Challenges</th>
<th>Other Relevant Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shahdad Keshan</td>
<td>Desert</td>
<td>Accessible by vehicle or foot</td>
<td>Dry environment</td>
<td>High-pressure system to be included at 3067.30</td>
</tr>
<tr>
<td>Ebadan Wanae Mountains</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Kechin</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kebbi</td>
<td>Federal Park</td>
<td>Accessible by vehicle or foot</td>
<td>Dry climate</td>
<td>High-pressure system to be included at 3067.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naka Kandh</td>
<td>Blue Main Valley</td>
<td>Accessible by vehicle or foot</td>
<td>Dry climate</td>
<td>High-pressure system to be included at 3067.30</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td>Katek</td>
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<tr>
<td>Keshin</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Diagram

(Description of the diagram is not transcribed due to limitations.)
<table>
<thead>
<tr>
<th>Location</th>
<th>Usage</th>
<th>Categories</th>
<th>Proposed Site Access</th>
<th>Proposed Site</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lualualei Naval Reserve</td>
<td>Federal Navy</td>
<td>Conversion site accessibility</td>
<td>Controlled access</td>
<td>-</td>
<td>For fire fighting resources.</td>
</tr>
<tr>
<td>Wai'anae</td>
<td>State DLNR, Division of State Parks</td>
<td>Conversion site accessibility</td>
<td>Public recreational area</td>
<td>-</td>
<td>For fire fighting resources.</td>
</tr>
<tr>
<td>Makapuu Head</td>
<td>State DLNR, Division of State Parks</td>
<td>Conversion site accessibility</td>
<td>Public recreational area</td>
<td>-</td>
<td>For fire fighting resources.</td>
</tr>
<tr>
<td>Waianaeo Beach Park (Kualoa)</td>
<td>State DLNR, Division of State Parks</td>
<td>Conversion site accessibility</td>
<td>Public recreational area</td>
<td>-</td>
<td>For fire fighting resources.</td>
</tr>
</tbody>
</table>

The priority candidate site, Diamond Head State Monument, is located at Waikiki in East Honolulu and is under DLNR Division of State Parks jurisdiction. The Diamond Head State Monument Master Plan includes areas which will remain as wildlands which are appropriate for a fire control introduction. This site has been approved by the Division of State Parks.

From a biological perspective, the Lualualei Naval Reservation environment is a preferred site with appropriate mesic land, soil conditions, and protected status. Moreover, the site is believed to be in the historic range of Aulahia meleagris with two individuals present at the NCTAMAS PAC Radio Transmission Facility and is monitored by Navy staff (H. Miyahara, personal communication). However, the current position of the Navy precludes the introduction of additional protected sites at this location. Follow-up communication with the Navy will occur after the approval of the HCP.

Important considerations in the selection of each site include the following:

- Generally, all sites may be exposed to fire threats, therefore, a site-specific fire protection plan will be developed for each site — as part of the site assessment selection process. The fire plan will include identification of the following: 1) fire-fighting resources, 2) response responsibilities, 3) location of water resources, and 4) plans for fire breaks and fuel control.

- All sites that pass are to be considered permanent sites, therefore, future urbanization within and adjacent to the sites must be analyzed and landuse commitments for preservation must be secured.
Strategy 5: Long term protection and maintenance of permanent A. montanum populations

As described in this HCP and in the MOA between DOT and DLNR (Appendix I), the funds for a 20-year period for active management, protection, and maintenance of three permanent transplant sites have been partially delegated by DOT and will be supplemented after the approval of the HCP. Additionally, DOT agrees with the need for management of three wild sites beyond 20 years. Therefore, as described in Strategy 5, the funds for such management will be derived from two sources: 1) interest earned (estimated at $400,000) on the delegated amounts of $930,000, and 2) Contingency Fund (within a portion of $700,000).

A further responsibility for long-term protection and maintenance of the permanent transplant sites after the HCP active management period of 20 years requires the commitment of Landowners of three transplant sites. The property owners will be required to commit to maintaining land use that is compatible with the protection and management of the A. montanum populations on their property. Thus, the site selection process has analyzed criteria such as landownership status and potential future urbanization pressures on the combine sites.

The MOA further states, “DLNR has the knowledge, expertise, and permanent presence needed to implement the mitigation of diminished and endangered species and agrees to implement the management of A. montanum populations as required in the HCP.”

Protection and Management of Wild Sites. The protection and management of the three wild sites will be funded through the monies contributed by DOT and earmarked for A. montanum and as described in the MOA “Exhibit A - Scope of Services” includes the following:

A. Maintain three wild populations. The purpose of the populations is to allow for natural seeding, recruitment and establish long-term viability of all three populations.

B. Propagation of a total representation of plants from cuttings from the Kapelo A. montanum population. These plants will be used to maintain genetic representation of stock and provide stock for riparian purposes.

C. Monitoring: 1) Pupate biannual reports of progress and findings, and 2) Maintain adaptive management strategy as needed to insure plant recovery and success.

D. At the end of the contract period, DLNR shall prepare a summary final report, providing recommendations for future actions and possible alternatives, if any, based upon documented findings and results.

Strategies 6: Appropriate research

The research component would augment the research and testing measures described in Task 1.5 of Strategy 1.5: Intrusive Management Program which includes biological research, testing, and identification of testing parameters.

Research would focus on the “habitation methods” of A. montanum to establish growth of three wild new transplant sites. A review of past research studies would be made and appropriately applied to this project as situations arise at the various transplant sites. These would be determined by DLNR.

Research may include studies of various aspects of life history, habitat, pollinates, reproductive biology, optimum requirements for growth, requirements for population viability, and control of thrips to better understand the requirements necessary for perpetuation of these plants. Such additional knowledge would allow for appropriate management and protection techniques to be developed.

6.1 Collect diagnostic data on crucial associate ecosystem components

1) Computation of flora and invertebrates, bird, and other fauna populations within the existing colonies to gain an understanding of any relationships between these organisms and A. montanum.

2) Comparison of such information collected over time correlated with data from monitored populations of A. montanum in natural locations to provide insight into the required and preferred habitat for the species.

6.2 Study various aspects of growth of A. montanum

1) Growth and mortality of seedlings, cuttings, transplanted parent plants;

2) Growth of mature plants, including seasonal changes, optimum conditions and limiting factors;

3) Seasonal differences in temperature and light needs;

4) Water sources and requirements;

5) Soil and nutrient requirements.

6.3 Study preemergence viability

1) Biodiversity systems including self-compatibility;

2) Pollination vector, and;

3) Preferred conditions for flowering and total set.

6.4 Determine the degree of threat posed by the nature of interactions with selected introduced/introduced species

Determine mechanisms of impact of diseases or pests. If diseases or introduced pests with negative impacts on A. montanum are discovered, effects and mechanisms of such would be
Strategy 7  Kapo‘olani Population strategy

An objective of the HCP over its 20-year program would allow the removal of the Kapo‘olani population and relocating the full genetic resource to three offsite protected locations on Oahu. To assure that the short-term success criteria are met before the full population is removed (as described in Section 7 Table 13) an 18-acre area within the Kapo‘olani population is established as a temporary contingency reserve. This area is shown in Figure 14, as well as on Figure 9.

An additional “Special Condition” to the State Incidental Take License to be issued to accompany the “Habitat Conservation Plan for Abalonia monensis at Kapo‘olani” would state, “No take or development will occur within the 18-acre area that surrounds the extant Abalonia monensis concentration within the area identified as Cluster C1 on the “Habitat Conservation Plan for Abalonia monensis at Kapo‘olani” until such time that one outplanting site has met the short-term success criteria described in the HCP.”

Management of the 18-acre reserve may include measures such as temporary fencing and firebreaks. If an outplanting site does not meet the short-term success criteria, this could be considered on a trial run.

Incidental Take

DLNR, as the property owner, will be responsible for the Kapo‘olani population until the Kapo‘olani projects are fully initiated and prior to the transfer of land to the Kapo‘olani project developers. A stipulation of the transfer of the property will be the issuance of an Incidental Take Permit by DLNR to enable the removal of the Kapo‘olani population plants to the outplant sites. The cost to remove and upkeep these “original plants” will be from the funds provided by DOT or from contributions to the Endangered Species Trust Fund. The costs associated with the transplantation of original plants would be from the allocations to each of the three wild sites.

The City and County of Honolulu will issue a right-of-entry permit to DLNR/DOFAW to collect propagules and conduct appropriate monitoring of the A. monensis individuals (as described in this HCP) on the City property. However, the City will have overall responsibility for the plants on its property.

Prior to the construction of the North-South Road and removal of A. monensis, DOT personnel will be consulting with DLNR regarding the location and treatment of the endangered plants along the project corridor.

Mitigation of the Seed Bank

To mitigate the seed bank at Kapo‘olani, DOFAW has collected seeds and cuttings from approximately 75% of all baseline plants. The uncollected 25% is the due to plants lost through attrition, etc.

Mitigation of the seed bank will focus on seed storage at Lyon Arboretum, vegetative propagation at the new Diligent Nursery, and the living genebank at Keiko Cates Botanical Garden. The documentation of the Lyon Arboretum collection is accessed at the following website: http://www.hawaiialoah.com/Lyons/Arboretum/Directory.html
The requirements of soil collection and storage may not be practical or feasible and collection is
impractical as a means to mitigate the need both when compared to the successful collection of seeds
and vegetative cuttings from the Kapleri population. Therefore, soil collection and banking is left to
be assessed at the discretion of DEND.

SECTION 4

Identify those measures or actions to be undertaken to protect, maintain, restore, or
enhance the ecosystems, natural communities, or habitat types within the plan area;
a schedule for implementation of the actions or measures, including monitoring,
that are to be undertaken in accordance with the schedule.

(a) Measures or actions to be undertaken to protect, maintain, restore, or enhance the
ecosystem, natural communities, or habitat types

Short-term and long-term measures and actions which would affect the existing adult
population have been described in detail in Section 3. The strategies outline the measures and
actions of the HCP for the existing adult, the interim management period, and the long-term period
as the entire complete mitigation populations.

(b) A schedule for implementation of the proposed measures and actions

The schedule for implementation of the proposed measures and actions is described in detail in
Section 3, Strategy (3).

All of the populations of A. melas have been and will be periodically monitored throughout each
of the phases of the HCP Implementation Schedule. Monitoring of the in situ and reintroduction
populations will be conducted to determine progress toward attaining a satisfactory state. Monitoring
will also be conducted to assess the status of the management unit relative to control of alien taxa
and to habitat restoration. In addition, monitoring is an essential part of adaptive management, which will be undertaken and is more thoroughly described in Section 8.
SECTION 5

Be consistent with the goals and objectives of any approved recovery plan for any endangered species or threatened species known or reasonably expected to occur in the ecosystems, natural communities, or habitat types in the plan area.

The preparation of the subject HCP involved the review of the Lost Plant Cluster Recovery Plan (USFWS 1991) which includes Abalone mexicanus as one of four endangered taxa. Appropriate guidelines are incorporated into the strategic contain map.

Abalone mexicanus is considered to be a "long lived" perennial and known to produce a life span greater than 15 years (USFWS 1991, page 69). Conversely, "short lived" perennials are those known to have life span greater than 1 year but less than 15 years. There are fewer than 700 A mexicanus individuals on Maui, Maui and Oahu. Oahu is a critical location (USFWS 1991).

The Lost Plant Cluster Recovery Plan states the most serious threats as browsing and trampling by introduced ungulates, competition from alien plants. Other threats include fire, seed predation, loss of pollinators, and disease. Additional threats noted on Maui and Oahu include agricultural and urban development.

The presence of the Kapalu population validates that the Lost Plant Cluster and possibly Laahaina and Ewa areas have native species for the species. Threats to the subject population at Kapauli include agricultural cultivation until 1994 and expanding urbanization as described herein.

The Lost Plant Cluster lists five necessary actions: 1) Prevent habitat from current and non-native threats, 2) Conduct research essential to conservation of the species, 3) Expel current populations, 4) Establish new populations as needed to reach recovery objectives, and 5) Validate and revise recovery objectives.

The total estimated cost of recovery for one (of nine) species in the Lost Plant Cluster Recovery Plan is estimated at $1,000,000 over a period of 20 years. The date of recovery (for all nine species) for downlisting to Threatened would be in 2012, if recovery criteria are met (USFWS 1994, page 4).

The Kapauli population is expected to be taken and relocated to the three new Suitable sites where threats will be actively managed, research conducted, and populations expanded over the 20 year period. To implement the HCP measure, a funding commitment has been made, as described in the Memorandum of Agreement (Exhibit G) between DOT and DLNR, for approximately $50,000 per year for a period of 20 years. Moreover, a commitment to implement the strategies of the HCP has been made by DLNR.

As indicated, there are no other endangered or threatened species in the Kapauli area. However, remaining, in situ Abalone mexicanus will be maintained and protected under DLNR until they are to be taken and relocated to the wild, suitable sites, as described under Task 1 of Section 3, Strategy 1. In addition, an objective of this plan is the establishment of suitable sites, which may become "suitable area" which may have other endangered species, and the coordination of these recovery efforts will also be performed by DLNR.

Table 12: Recovery Objectives of the Lost Plant Cluster Plan and HCP Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Local Recovery Plan</th>
<th>Associated HCP Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing</td>
<td>To be established while each taxon may be protected or recovered</td>
<td>The HCP goal is to establish the area and wild populations on Maui from the original degraded, introduced population in Kapauli. At the new population, the mix of fire, vehicles, must be reduced, and the control of introduced species must be initiated.</td>
</tr>
<tr>
<td>Establishing</td>
<td>To be established while each taxon may be protected or recovered</td>
<td>The HCP goal is to establish the area and wild populations on Maui from the original degraded, introduced population in Kapauli. At the new population, the mix of fire, vehicles, must be reduced, and the control of introduced species must be initiated.</td>
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</tr>
</tbody>
</table>

The funding for the HCP is provided by DOT and implementation of the HCP is by DLNR as described herein.
SECTION 6

Provide reasonable certainty that the ecosystems, natural communities, or habitat types will be maintained in the plan area, throughout the life of the plan, in sufficient quality, distribution, and extent to support within the plan area those species typically associated with the ecosystems, natural communities, or habitat types, including any endangered, threatened, proposed, and candidate species known or reasonably expected to be present in the area. The ecosystems, natural communities, or habitat types of the Kāpōhi property are described in Section 1(b). Studies by Nagata (1996) and Chit (1997, 1997, 2003, 2004) indicate that, for the most part, the landscape and ecological conditions are typical of following successional fields at similar locations. It should be noted that other listed, endangered species have not been discovered in this area, and the interdependency of any organism with A. monticola has not been established at this point.

As described in Section 3, Strategy (1) and (4), the establishment of three new suitable wild populations is a major goal of this HCP, as such, these will ultimately be three "plan areas". Several more potential upland sites are planned, in order to achieve a minimum of three successful sites.

A primary purpose of the Initial Management Program was to preserve the genetic resource at the Kāpōhi population and to test the viability of establishing at appropriate offsite locations. This represents the initial work towards providing a reasonable certainty that the natural Kāpōhi community of A. monticola will be maintained. The initial results of the Initial Management Program are promising indications that new plants can eventually be grown from seeds and cuttings, and potentially, new populations can now be established at appropriate offsite locations to maintain a habitat for this species. At the Kaiwa Point upland site, a coastal stream community including approximately 20 native species has been initiated and seeded vegetation has been reported.

The initial results indicate that with the continued management there is reasonable certainty that A. monticola will be maintained as a viable community. However, a final assessment will require continued management over time.

SECTION 7

Contain objective, measurable goals, the achievement of which will contribute significantly to the protection, maintenance, restoration, or enhancement of the ecosystems, natural communities, or habitat types; time frames within which the goals are to be achieved; and provisions for monitoring (such as field sampling techniques) and evaluating progress in achieving the goals quantitatively and qualitatively.

(1a) Objective, measurable goals, the achievement of which will contribute significantly to the protection, maintenance, restoration, or enhancement of the ecosystems, natural communities, or habitat types

The primary objective of the HCP is the continued survival of the Kāpōhi genetic stock of A. monticola through the establishment of three new wild populations and an offsite ex situ breeding site from the degraded mainland population at Kāpōhi. To achieve this goal, several sites will be examined, managed, and monitored for a period of nine years before a determination is made whether a site has met the success criteria described herein. The short- and long-term goals are summarized in Table 1:

<table>
<thead>
<tr>
<th>Table 1. HCP Short-term and Long-term Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short Term Goals</strong></td>
</tr>
<tr>
<td>1) Transplant and re-establish the Kāpōhi population of A. monticola.</td>
</tr>
<tr>
<td>2) Monitor and verify the success of the initial transplantation.</td>
</tr>
<tr>
<td>3) Establish new suitable wild population at offsite sites.</td>
</tr>
<tr>
<td>4) Establish a wild population of A. monticola at Kaiwa Point.</td>
</tr>
<tr>
<td><strong>Long Term Goals</strong></td>
</tr>
<tr>
<td>1) Monitor the new population of A. monticola for at least one year.</td>
</tr>
<tr>
<td>2) For each wild population maintain an effective population of 100 adult and young plants.</td>
</tr>
<tr>
<td>3) Establish new suitable wild population at offsite sites.</td>
</tr>
<tr>
<td>4) Establish a wild population of A. monticola at Kaiwa Point.</td>
</tr>
<tr>
<td>5) Monitor the effectiveness of the new population to ensure viability and reproductive success.</td>
</tr>
<tr>
<td>6) The goal for survival is to maintain at least one adult population of at least 67 individuals for a period of 10 years.</td>
</tr>
<tr>
<td>7) Naturalization of A. monticola in upland habitats and establishment of additional populations.</td>
</tr>
</tbody>
</table>
(6b) Time frame within which goals are to be achieved

At this time, the goals are anticipated to be achievable within the 20-year timeframe of the HCP. Following the 20-year period of active implementation and management, subsequent monitoring and any necessary management actions would be undertaken through a separate agreement with DLNR (or other qualified organization), for a period of time to be specified by DLNR and the Endangered Species Recovery Committee, until the final determination is made that the three species are firmly established.

(7c) Provisions for monitoring and evaluating progress in achieving the goals quantitatively and qualitatively

The criteria to measure success of the HCP actions include short-term, long-term, and overall criteria, as described in Table 14.

Table 14: Measurable Criteria for Monitoring and Evaluating Progress of Goals

<table>
<thead>
<tr>
<th>Success Criteria</th>
<th>Measurable Short-Term Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1) At least 25% of the full complement of humpback whales in a population must survive for 2 years after initiation is ceased.</td>
</tr>
<tr>
<td></td>
<td>2) During the first 5 years after each wild population is established, there must be at least 35% of the full complement of humpback whales after initiation is ceased.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurable Long-Term Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) The number of surviving adults at the age of reproduction in a given population, averaged over a five-year period after initiation is ceased.</td>
</tr>
<tr>
<td>2) The number of new births occurring into the mature age class must be greater than the mortality rate of surviving adults, averaged over a five-year period after initiation is ceased.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overall Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>If both Long-Term Success Criteria are met and there are more than 100 reproducing adult males present at the end of a five-year period, then a total of 90 percent of the species present in the wild will be part of the recovery process.</td>
</tr>
</tbody>
</table>

Strategies which have been completed or are in progress (including Strategies 1(4) and 4) have demonstrated promising initial results of the HCP actions. Approximately 80% of humpback whales have been propagated by DLNR and released to three sites. At this time, the 1,000 population increase in total number of humpback whales over the original baseline of 90 percent is a positive preliminary indicator of establishing three ex situ wild populations.

An annual reporting process is required by Chapter 195A-34(2), HIUS, which states: "Participants in habitat conservation plan shall submit an annual report to the department within 90 days of the fiscal year ending June 30, that includes a description of activities and accomplishments, analysis of the problems and issues encountered in meeting or failing to meet the objectives set forth in the HCP, an assessment of technical advice, status of funding, and plans and management objectives for the next fiscal year, including any proposed modifications thereto." In addition, monitoring will occur...
SECTION 8

Provide for an adaptive management strategy that specifies the actions to be taken periodically if the plan is not achieving its goals.

Adaptive management is a strategy that allows for the change of management actions described in the HCP to ensure that the goals and accompanying success criteria of the HCP are achieved. Information from monitoring activities and other sources (e.g., research) will be used to evaluate whether the biological goals and success criteria of the HCP are being achieved and may be used to refine the design, scope, or implementation of the management actions described in the HCP.

Monitoring of the outplanting sites, which are intended to be self-sustaining, wild populations of *A. merriami*, as well as propagation and nurturing methods, and an examination of threats will be conducted to determine progress toward achieving the short-term and long-term goals and success criteria of the HCP. Monitoring will also be conducted of the Kapolei population of *A. merriami* to track (e.g., survival, morality, reproduction) live plants, including new recruits, remaining on site in order to maintain a complete representation of the genetic diversity of this population. Modifications to the management of the Kapolei population and outplanting sites will be made based on the results of the monitoring program and any research results in new information regarding *A. merriami* (e.g., crucial ecosystem components, growth aspects, reproductive viability, outplanting methods, item control methods, salt tolerance, genetics, seed bank dynamics).

The monitoring protocols are for various aspects of the HCP, as modified from the Makua Implementation Plan's Appendix E. Each monitoring protocol provides a description of the: 1) monitoring objectives; 2) monitoring methods and data analysis; 3) monitoring activity; and 4) potential management activities to be implemented in response to the information gathered.

Final decisions to change certain management actions will be approved by the DOT and DLNR DOWAF. DLNR DOWAF will determine which actions require additional recommendations by the USFC.

There are five monitoring protocols which are described below:

1. **MONITORING PROTOCOL 1** - Monitor Individuals of *A. merriami* in the Kapolei Population
2. **MONITORING PROTOCOL 2** - Conduct Phytoexamination Monitoring in Greenhouse Facilities
3. **MONITORING PROTOCOL 3** - Assess Status and Stability of Outplanted Populations
4. **MONITORING PROTOCOL 4** - Conduct Phytoexamination Monitoring at Outplanted Populations
5. **MONITORING PROTOCOL 5** - Monitor Success of Outplanted Individuals

The monitoring protocols are described in detail below.

**MONITORING PROTOCOL 1** - Monitor Individuals of *A. merriami* in the Kapolei Population

Type of activity: Monitoring. A goal of the Habitat Conservation Plan for *A. merriami* at Kapolei ("HCP") is to provide a complete representation of the genetic diversity and survival of the Kapolei population of *A. merriami*.

Description: Conduct monitoring of the survival of the Kapolei population; to determine pheno- and genotypic composition; and to collect propagules for storage, propagation, or experimentation.

Applicable site: Kapolei population within the Kapolei population.

Management goals: Determine which set of propagules is highly probable. Successfully collect an adequate number of propagules to achieve the goals for the HCP (e.g., genetic diversity of the Kapolei population). Manage to maintain the existence of the Kapolei population (e.g., survival of existing individuals and additional recruits until 2041).

Monitoring methods: Be sure that the window for collection will ensure successful seed collection if plants reproduce.

Management response: Adjust schedule according to pheno-analytic patterns of *A. merriami* for seed collection.

Area to monitor: The Kapolei population of *A. merriami*, with the purpose of locating mature individuals from which propagules will be collected.

Data to collect: Data will be collected following the Hawaii Resilience Plant Monitoring Group (HRPG) best plant monitoring format. Record location information (map and GPS coordinates) as needed for any new mature individuals of *A. merriami* found in the Kapolei population.

1. Reproduction status of all individuals - record presence of flowers (mature or immature), and fruit (edible or unedible) and numbers of individuals with each.
2. Collection information - *A. merriami* collection numbers to plants sampled, designate purpose for collection before collecting. This information should follow all propagules throughout its life.

Data analysis methods: No statistical analysis are needed for this protocol. All data resulting from the field surveys should be entered into a database and GIS.
Data collection interval: Monitor the population weekly to determine density or visit at the site of the population annually.

**MONITORING PROTOCOL 2: Conduct Physiological Monitoring in Greenhouse Facilities**

**Type of activity:** Monitoring. A component of the HCP to establish three wild, self-sustaining A. mexicanus populations on Oahu.

**Description:** Maintain plants in a greenhouse facility to determine if they are not contaminated with new pathogens or pests and are free of concern. The monitoring protocol may be used as a reference.

**Applicable for:** Plants in the greenhouse facility to determine if they are not contaminated with new pathogens or pests and are free of concern.

**Management goal:** Reduce the risk of introducing new pathogens or pests and to ensure that plants are not contaminated with new pathogens or pests.

**Preliminary sampling objectives:** To reduce the risk of introducing new pathogens or pests and to ensure that plants are not contaminated with new pathogens or pests.

**Management response:** If pathogens or pests are detected in the greenhouse facility, the plants must be re-examined and the affected area treated.

**Group to monitor:** All of the individual plants in the greenhouse facility.

**Monitoring framework:** Examine all individual plants for presence of pathogens or pests.

**Data to collect:**

1. Presence or absence of pathogens or pests of concern - Record the presence of pathogens or pests of concern.
2. Type of pathogens present - Identify the type of pathogens present. A pathogen is not confirmed, then make a further identification by identifying pathogen symptoms. Document the presence of pathogens and collect samples for analysis.

**Data analysis methods:** No statistical analysis is needed for this protocol. However, it is essential that a proper pathogen sample be taken of all the plants that are in the population to determine if they are free of pathogens or pests.

**Data collection interval:** Data must be collected during the growing period and prior to transplanting. Monitoring should be conducted at least bi-weekly. The sampling must be done just before planned transplanting date because any lag between inspection and planting may allow for new pathogens to become established.

**MONITORING PROTOCOL 3: Assess Status and Stability of Unplanted Populations**

**Type of activity:** Monitoring. A component of the HCP to establish three wild, self-sustaining A. mexicanus populations on Oahu.

**Description:** Conduct initial baseline survey and continuing monitoring program for A. mexicanus within each unplanted population to assess its status relative to the goals and success criteria identified in the HCP. Additionally, determine if the demographic structure of each unplanted population will be able to meet the overall goals and long-term success criteria of the HCP. Data will be collected on the distribution, abundance, status (type), population structure, and phenology of plants sampled, as well as evidence of damage by animal species (e.g., insects, rats, slugs) within an unplanted population.

**Applicable for:** Each unplanted population of A. mexicanus on Oahu intended to be a wild, self-sustaining population.

**Management goal:** Manage each unplanted population to achieve the specified number of mature, reproducing individuals, and duration as specified in the HCP.

**Preliminary sampling objectives:**

1. Determine the number of mature plants capable of reproduction in each unplanted population is equal to or greater than the minimum number specified in the HCP to achieve the short-term success criteria.
2. Determine if the demographic structure of each unplanted population appears to be adequate to sustain a viable population of A. mexicanus over time.

**Management response:** If population stability is not achieved, one or more of the following responses are appropriate: 1) Continue with same management program for a longer time, 2) Implement additional control measures, or 3) Select another location to establish a wild, self-sustaining population.

**Area to monitor:** Systematic survey of all of the individuals in each unplanted population. Individuals must be within 500 meters of another plant of the same species considered to be part of that population.

**Pilot studies:** It is important to emphasize that the suggestions that follow regarding monitoring framework is not a complete protocol, and the data analysis methods are preliminary suggestions that need to be developed following completion of pilot studies in the unplanted populations. Pilot studies will be used to collect data that will be used to refine the protocol relative to variables which will be sampled, plot size and shape, sampling framework, number of samples to be taken, monitoring interval, and data analysis methods to be used.
Sample units: Outplanted population.

Monitoring framework: Either of several survey strategies may be used initially to establish the monitoring framework for this protocol. Continue to use that strategy for subsequent monitoring of the population.

1. Census of plants in the outplanted population. All individuals within an outplanted population will be located and data collected as specified below.

   Data to collect: The fields described below are included in the HREPRG's Rare Plant Field Data Form, which may be used for data collection in this monitoring protocol.

   1. Location of individuals - this would be the quad number if sampling conducted along contiguous plant belt transect, or GPS coordinates (UTM Zone 4 NAD 83 datum base) if using cluster sampling strategy. Some of the individuals in the population may be uniquely identified and tracked together to help with collection of propagules or to allow for the collection of data on the progress of individuals through size or stage classes. Where GPS points cannot be used to locate individuals, the position of individuals will be hand-drawn in relationship to local landmarks and topography.

   2. Number of individuals - use the following life-stage classes as defined for A. merrii: seedling, immature adults, and reproductively mature individuals. Each of these classes must be determined for A. merrii. For most outplanted populations, all of the mature plants will be located and counted.

   3. Vizor of all individuals in the following classes: healthy - foliage appears green and vigorous, less than 10% dead leaves or defoliation, moderate - some chlorosis or defoliation (e.g., control extremely small, minor damage) may be seen in the leaves, 10-50% dead leaves or defoliation, poor - most leaves may be dead or chlorotic or defoliated, 50% dead leaves or defoliation; dead - no live foliage or woody tissue.

   4. Evidence of damage from alien agents: data will be recorded on the presence or sign of damage on the sampled plants from alien agents, particularly investigate rats, or snails.

   5. Phenological stage: record data on the presence of buds, flowers, immature fruits, mature fruits, or reproductive state for each plant, or if the plant is reproductive, its stage. This information will be summarized for the population as a whole.

Data analysis methods:

1. To many cases all of the individuals within an outplanted population will be enumerated to direct computations of the sampling numbers will be made with the specified short-term and long-term goals and success criteria of the ICP.

Data collection interval: Data should be collected on the status of each outplanted population annually. It would be ideal if data collection could coincide with time of fruiting by the plants to better evaluate seed set and to allow for collection of additional propagules, if needed, at the same time. In any case data should always be collected in the same month of the year for a specific outplanted population.

**MONITORING PROTOCOL**

1. Conduct Physocarpus Monitoring at Outplanted Populations

   Type of activity: Monitoring - A component of the ICP to establish and monitor A. merrii populations on Ohau.

   Description: Maintain baseline inventory for pathogens at outplanted populations and phytoncides monitoring on outplanted individuals to determine if they are contaminated by new pathogens or other species of concern (Appendix 2.2 Physocarpus Standards and Guidelines for the Mauke Implementation Plan may be used as a reference).

   Applicable here: All outplanted sites on Ohau and outplanted individuals of A. merrii.

   Management goal: To detect and control any introduction of a pathogen from the greenhouses or other site environment into the outplanted site.

   Preliminary sampling objectives: Be certain that all outplanted individuals are not inadvertently contaminated by pathogens or other pest species of concern, and other individuals within the vicinity of the outplanted site are not contaminated above the baseline as a result of the outplanted. Pathogens or pest species of concern must be identified by an expert.

   Management response: If pathogens or other pest species of concern are discovered on outplanted individuals, there are options: 1) eliminate the problem with an appropriate control technique and continue to monitor in the field, or 2) remove contaminated plants from reintegration site and treat the contaminated planting sites with an appropriate pesticide to eliminate the problem in the field.

   Additionally, if contaminated plants are found in the field, it is necessary to reevaluate the greenhouse phytoncides monitoring protocol to determine whether it failed and to make modifications to that protocol if needed.

   Group to monitor: All of the individual plants that were outplanted, as well as a sample of other plant taxa within the outplanted area.

   Monitoring framework: 1) Examine all individual plants that were outplanted. 2) Conduct a pilot study to determine the extent and number of plants to be examined for pathogens or other pest species of concern within the study area.

Data to collect:

1. Presence or absence of pathogens or pests of concern - Record outbreaks of pathogens or pests of concern.
2. Identify type of pathogen present. If pathogen is not controlled, then make a further identification by identifying pathogenic symptoms, document via photo and collect sample for analysis.

Data analysis methods: No statistical analyses are needed for this protocol.

Data collection intervals: Data should be collected on the status of plants at each outplanted site monthly for the first three months and then every three months to complete first year.

MONITORING PROTOCOL 3 – Monitor Success of Outplanted Individuals

Type of activity: Baseline survey and monitoring. A component of the HCP to achieve the short-term and long-term goals and success to achieve those wild and self-sustaining populations at native populations on Guam.

Description: Monitor germination and survival, growth, reproduction, and phenology of all individual plants that have been outplanted or introduced in areas for d. menziesii in an area. The data must be collected to develop and refine techniques that maximize the survival of individual plants that are outplanted into the wild. In addition to the information on the survival of individual plants that are outplanted into the wild, the objective is to determine how many individuals need to be planted if the outplanted population is to be sustained. Monitoring may be focused on determining germination or survival and growth of all individuals outplanted.

Applicable for: Plants or seeds outplanted to sites intended to meet the goal of being a wild and self-sustaining population. Monitoring may be focused on determining germination or survival and growth of all individuals outplanted.

Management goals: 1) Determine germination and survival of plants, and 2) document horticultural methods used for propagation and outplanting (e.g., cuttings, mound layering, seedling, etc.)

Preliminary sampling objectives: 1) Track lineages of outplanted individuals in determining if sufficient genetic diversity of the population is represented in the outplanted population. 2) Track survival and growth of outplanted individuals.

Management response: 1) The results of monitoring plant growth relative to the different horticultural treatments will be used to help predict the results of the plant survival analysis. The results of the analysis of survival will also be used to determine if the required number of individuals to outplant for d. menziesii to achieve a specified number of plants that will become part of the reproductive pool.

Area to monitor: Complete outplanted population.

Monitoring framework: All outplanted individuals will be maintained.

Data to collect:
1. Percent germination of planted seeds. When seeds are planted as a planting strategy, the number of individuals that germinate will be counted in a specific area and the number of individuals that germinate will be calculated by dividing the number of germinating by the total number of seeds planted.

Type of activity: Baseline survey and monitoring. A component of the HCP to achieve the short-term and long-term goals and success to achieve those wild and self-sustaining populations at native populations on Guam.

Description: Monitor germination and survival, growth, reproduction, and phenology of all individual plants that have been outplanted or introduced in areas for d. menziesii in an area. The data must be collected to develop and refine techniques that maximize the survival of individual plants that are outplanted into the wild. In addition to the information on the survival of individual plants that are outplanted into the wild, the objective is to determine how many individuals need to be planted if the outplanted population is to be sustained. Monitoring may be focused on determining germination or survival and growth of all individuals outplanted.

Applicable for: Plants or seeds outplanted to sites intended to meet the goal of being a wild and self-sustaining population. Monitoring may be focused on determining germination or survival and growth of all individuals outplanted.

Management goals: 1) Determine germination and survival of plants, and 2) document horticultural methods used for propagation and outplanting (e.g., cuttings, mound layering, seedling, etc.)

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Management response: 1) The results of monitoring plant growth relative to the different horticultural treatments will be used to help predict the results of the plant survival analysis. The results of the analysis of survival will also be used to determine if the required number of individuals to outplant for d. menziesii to achieve a specified number of plants that will become part of the reproductive pool.

Area to monitor: Complete outplanted population.

Monitoring framework: All outplanted individuals will be maintained.

Data to collect:
1. Percent germination of planted seeds. When seeds are planted as a planting strategy, the number of individuals that germinate will be counted in a specific area and the number of individuals that germinate will be calculated by dividing the number of germinating by the total number of seeds planted.

Type of activity: Baseline survey and monitoring. A component of the HCP to achieve the short-term and long-term goals and success to achieve those wild and self-sustaining populations at native populations on Guam.

Description: Monitor germination and survival, growth, reproduction, and phenology of all individual plants that have been outplanted or introduced in areas for d. menziesii in an area. The data must be collected to develop and refine techniques that maximize the survival of individual plants that are outplanted into the wild. In addition to the information on the survival of individual plants that are outplanted into the wild, the objective is to determine how many individuals need to be planted if the outplanted population is to be sustained. Monitoring may be focused on determining germination or survival and growth of all individuals outplanted.

Applicable for: Plants or seeds outplanted to sites intended to meet the goal of being a wild and self-sustaining population. Monitoring may be focused on determining germination or survival and growth of all individuals outplanted.

Management goals: 1) Determine germination and survival of plants, and 2) document horticultural methods used for propagation and outplanting (e.g., cuttings, mound layering, seedling, etc.)

Preliminary sampling objectives: 1) Track lineages of outplanted individuals in determining if sufficient genetic diversity of the population is represented in the outplanted population. 2) Track survival and growth of outplanted individuals.

Management response: 1) The results of monitoring plant growth relative to the different horticultural treatments will be used to help predict the results of the plant survival analysis. The results of the analysis of survival will also be used to determine if the required number of individuals to outplant for d. menziesii to achieve a specified number of plants that will become part of the reproductive pool.

Area to monitor: Complete outplanted population.

Monitoring framework: All outplanted individuals will be maintained.
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INTRODUCTION

The project site occupies approximately 1500 acres in compounds and farmlands. The site encompasses the former sugar cane land on the west side of the Unquillo reservoir. The eastern boundary runs through abandoned sugar cane fields.

Ripperdon and Holda (1962) classified the vegetation of the region as one of lowland shrub with a coastal fringe of kave trees (Prosopis pallida). Because of the acidic conditions of the region the vegetation cover is generally sparse. Upper shrubs include Pachycnema incommoda, low-bush legume (Glycine parviflora) and 'Un'amu (Celtis egensis) and the herb layer generally consists of annual grasses such as Digitaria decumbens, barnyardgrass (Echinochloa crus-galli) and roost itchgrass (Digitaria sanguinalis). In the floodplain are native and exotic shrubs and legumes such as Mimosa pigra, Calliandra laevigata, and Malva parviflora.

In addition to the annual grasses of the lowlands,

several recent surveys have been conducted in certain portions of the subject property and in the adjacent lands. In 1960 Fink completed a biological survey of the land immediately east and north of the project site, including the village of Unquillo (Fink 1962). Among the vegetation types enumerated were Sugar Cane Fields, cereal fields and fallow fields. These communities were characterized by actively cultivated sugar cane fields, abandoned sugar cane fields, common"weedy" introduced plants and lowland wayside species including those mentioned by Ripperdon and Holda (1962). Similar vegetation was found in the region immediately east of the subject property where common wayside species including barnyardgrass, Guiana grass (Eriachne omissa) and cultivated and abandoned sugar cane fields were found to be prevalent (Fink 1965). Many of these same species were also present in the area between the Unquillo reservoir and the Abandoned Sugar Cane Fields (Rogers 1956) and in the town of Unquillo (Rogers 1954).

METHODOLOGY

A well-planned survey was conducted in all plant communities between mid-September and early October, 1960 to determine the floristic composition of the project site. Transects were established throughout the site and all plants observed were recorded and their relative abundance determined. In conjunction with the plant survey a summary inventory of animals was also made. All birds and mammals observed along the transects were recorded and birds were established as regular intervals. No quantitative analyses of data were attempted, however, and reports were not investigated.

RESULTS

Virtually all of the lowlands and floodplains in the Unquillo region has been altered by the cultivation of sugar cane. In the past several years certain lands have been burned out of sugarcane and put to other use, e.g., diversified agriculture, urbanization, following. Consequently, the vegetation of these lands is entirely secondary and the vegetation in the region is largely determined by the history of cultivation or disturbance of each individual parcel of land. However, the vegetation has been abandoned, whether the land was recently tilled, etc. Based on these criteria, eight plant communities were recognized. Although they have been drawn with distinct boundaries on the vegetation map it must be remembered that such limits do not exist in nature. Rather, each community exists as a continuum with one blending into another. Furthermore, the survey was conducted during the dry season. Species composition and vegetation cover differ considerably during the rainy season.

Abandoned Sugar Cane Fields (ASCF)

This is the largest vegetation type in the project site, representing the most recently abandoned sugar cane fields. Here, sugar cane generally accounts for about 50% of the total vegetation cover. In some areas the cane is 15' tall, robust and still very dense. In most areas, however, the cane is small, less than 3' tall and accounts for as little as 30% of the total vegetation cover. In fields that have been abandoned for a longer period or where growing conditions were not optimal the clumps of cane are mostly dead or drying. Even in those fields where clumps of cane are still in distinct rows, the vegetation between clumps usually consists of a mixed herb cover of 'Un'amu, Guiana grass, barnyardgrass, "Un"amu (Celtis egensis), honey beetle (Bembecia tarsctica), and other species (Diceratia floribunda) and exotic grasses (Pennisetum typhoides). Total vegetation cover is generally about 75-90%; only where the cane is vigorous and dense is the cover up to 100%.

In some areas such as along the Unquillo boundary the abundance of cane...
is very low and the vegetation approaches that of the fallow fields. Here the vegetation is more open with more exposed ground. 'Ilani, 'ashaka, peris, hoary abilon and little bell (nigouna guliha) are abundant.

**Fallowed Fields**

The fallowed fields are those sugar cane fields which have been abandoned for such a long time that almost no living cane remain. Dead and dying clumps generally constitute less than 5% of the total cover. Dead cane stalks may litter the ground and planting furrows may still be evident, but these fields are often difficult to recognize as sugar cane fields without close examination. The fallowed fields subcommittees were recognized depending on the relative abundance of grasses.

**Fallowed Fields Mixed Herb Association (Fea)**

Typically the vegetation in this community is less than 4' tall and consists of a mixture of 'ashaka, radiate fingergrass, 'ilani, hoary abilon, false mallow, buffelgrass (periscia canina), golden crown-beard (veronica acutifolia) and corn linter (fistula concolor). Small isolated stands of dying cane occur in certain portions of this community. Small patches of Guinea grass and radiate fingergrass can also be found. These grasses along with sulphur grasses (schizachyrium sternum), sowgrass (aquaticus angustifolius) and Natal rood mop (ischaemum rigida) are especially common in the muck portion of the community. Along the road delineating the muck boundary the vegetational cover is only about 50%. Above this (ischaemum rigida) is common in this open area. Several stands of dead or dying cane also occur here.

**Fallowed Fields Grassland Association (Fe1)**

In certain areas the fallow cane fields are dominated by Guinea grass and radiate fingergrass. Almost no standing cane remain although the furrows are still clear or less intact and fallen cane stalks are occasional throughout the community. In most areas the grass cover is 100% but small comminities and individuals of 'ilani, hoary abilon and false mallow are scattered through certain portions and radiation fingergrass and sowgrass are common in other areas.

**Abandoned Fields (A)**

Several former cane fields in the muck portion along Palehua Road and between Farrington Highway and the H-1 Freeway have been tilled or graded sometime in the past. The ground is quite level with few times and although some sugar cane is reproducing the planting furrows are gone. These fields were probably planted in some crop in years past but are now overgrown with mostly 'ashaka, false mallow, not grass and little bell. In one field beside of Farrington Highway Guinea grass is abundant but in most of the abandoned fields this species is not quite so prevalent. Re-opening sugar cane in also common in the muck portion of this field. Golden crown-beard, peris and hoary abilon are common in some of the fields.

**Cultivated Fields (C)**

Cultivated fields are fields which have been recently plowed, actually planted in a crop (other than sugar cane), or which have been put to some urban use. Of the five fields designated as cultivated fields, three have been recently plowed. The vegetation in these consists mostly of seedling little bell, peris, false mallow, 'ashaka, castor bean (fistula concolor), graceful spurge (chamaesyce hystrix) and re-opening sugar cane. Vegetational cover is about 25-30%. In two fields re-growing radiate fingergrass have been planted and along the Ewa boundary fence an approximately two-acre site has been graded and turned into a parking lot. Approximately half of this field has been paved with gravel. Most of the vegetation in this portion consists of re-opening sugar cane and peris. The vegetation in the south portion consists of peris, radiate fingergrass, false mallow and re-opening sugar cane.

**Grasslands (Gr)**

Grasslands represent those lands which apparently have not been tilled, graded or planted in my crop including sugar cane. This community occurs only on the steep slopes just west of the H-1 Freeway and in the smallest of all the vegetation types in the project site. The vegetation is one of Guinea grass 1-2' tall with emergent kni, qua-hau and klave. In eroded slopes, 'ilani, false mallow, 'ashaka, Poa hatschbachiana, sedge grass (chamaesyce hystrix) and virgate spurge (euphorbia virgata) are found in small numbers.

**Galiga Association (Gg)**

Fabled Galiga makes up its tributary Mahoalo Galiga which represents the only natural drainage system in the project site. The vegetation in the patches is characterized by extremely dense stands of Guinea grass 5-10' tall. So dense is this layer that very few other species are present. In the eaulah portion the predominant sub-trentant species is castor bean which grows to about 15' height. Eaulah 20-30' tall replaces castor bean as the dominant sub-trentant in the muck portion of the galiga system. In the muck portion of Mahoalo Galiga green grass (periscia canina) is abundant, often completely masking the Guinea grass and cow-hau. For grass (euphorbia virgata), road rose (houtteia humilis),

...
some flower (Pavonia) and perils are also found but only in small to moderate numbers.

Native Plant Communities

As a result of decades of sugar cultivation, virtually all of the vegetation in the project area is secondary in nature. Of the 59 plant species recorded two are indigenous (Ulan, po'ouli'ula); two are probably indigenous (Ulan, he'e); and one is endemic (ke'ala’a, hapaii mutsuki). Of these, Ulan, he'e, and hapaii are dominant or co-dominant in several plant communities and are significant elements in the vegetation in the area as a whole. Po'ouli'ula is found in small to moderate numbers in four vegetation types and is common in certain areas in the Fallow Field Herb Community. It frequently grows in association with Ulan, he'e, and hapaii. They do not, however, represent native plant communities. Rather, these native or possibly native species are well adapted to avoid weeds and are able to colonize disturbed sites.

Except for kalo and all of the native species in the area are considered introduced species in Hawaii. To'ala, on the other hand, is a race and endangered species once endemic to Maui, Oahu, and Hawaii. It is now extinct in Hawaii.

Endangered Species

At least 29 individuals of the federally listed endangered species ko'ala'ala were recorded in the area. Most of these (28) were in the Abandoned Cane Fields, six were in the Fallow Field Herb Association and one was in the Fallow Field Grassland Association. Approximate locations are indicated on Figure 2. All of these plants were healthy and were flowering and/or fruiting.

Ko'ala'ala was first submitted for listing as an endangered species in 1976 (Fed Reg. 1976). The Endangered Species Act Amendments of 1978 required that the list of candidates for endangered status be withdrawn after two years and in 1979 ko'ala'ala was withdrawn from consideration (Fed Reg. 1979). In 1980 it was redesignated as a top priority Category 1 candidate (Fed Reg. 1980) and in 1985 the U.S. Fish and Wildlife Service proposed to list it as an endangered species (Fed Reg. 1985). On Sept. 16, 1986 it was formally listed (Fed Reg. 1986) and is now protected under the provisions of the Endangered Species Act of 1973, as amended, and the Hawaii State Revised Statutes. Significant wild populations of ko'ala'ala are found on Maui and Kauai but its occurrence on Oahu is somewhat of an enigma. It was known from a single plant discovered in an abandoned sugar cane field near of the former Hawaiian Trucks at Barber Point in 1951 and more recently from another individual at the Honolulu Naval Magazine (R. W. Bell, pers. comm.). Both of these occurrences as well as the current discovery are in highly disturbed environments. The Barber Point location is approximately 10 miles from the project site and the Honolulu site is at least 15 miles away. Ko'ala'ala was not found in any of the prior reports in the immediate area (Funk 1960; 1974; Macke 1980, 1985).

ENDANGERED PLANTS

A monocot was observed in the area. It is probably, however, that field site (Eriogonum), native (Hapalostyla monotis) and one or more species of cane (Saccharum officinarum) are found in the property. In addition, pig trails were observed in several plant communities.

BIRDS

Seventeen species of birds were observed in the area. To be considered a sighting, the individual must be observed perched or on the ground and not merely flying overhead. In addition, owl pellets were found in the Fallow Field Grassland Association community. It is not known, however, whether there are from the barn owl (Tyto alba) or from (Glaucous Falcons). Fifteen species are introduced, one in a common migratory species (Flocke golden plover) and one in indigenous (Black-crowned Night Heron).

ARACIDAE

Cattle egret (Bubulcus ibis)

Eight individuals were observed in the Abandoned Fields north of Farrington
Highfly. On 4 October the Abandoned Field community immediately east of the Cultivated Field east of Palehua Road was being plowed. Nearly 100 cattle egrets were seen feeding in the freshly turned ground.

Black-crowned night heron (Nyctanassa violacea)

Two young birds were flushed out of Hanahou Gulch near Plantation Road.

It was noted that no birds were flushed out of Hanahou Gulch or Kualoa Gulch. It is not known whether these individuals are residents of the area or whether they are transients.

The black-crowned night heron is indigenous to Hawaii.

**Columbidae**

Pacific golden-plover (Pluvialis dominica)

The Pacific golden-plover is a migratory species which commonly spends the winter in Hawaii. Many were observed in the site. Thirty-two were counted in the exposed areas in the Abandoned Cane Fields. Most of these were in the open site near the Hanahou boundary. Twenty-six were observed in various areas in the Fallowed Field Mixed Herb Association. Six of them were in the exposed areas near the Hanahou boundary road. Twenty-six were seen in the Cultivated Areas. Of these, 20 were in the "parking lot" near the Hanahou boundary.

**Columbidae**

Rack dove (Geophaps varius)

Three were observed in the exposed section of the Fallowed Field Mixed Herb Association in the Hanahou portion of the site.

Bristle dove (Geophaps varius)

Many were seen in all but two vegetation types. They were most abundant along the paved roads.

Lace-neck dove (Geophaps varius)

This is the most widespread species in the property. It was found in moderate numbers in all vegetation types.

**Fringillidae**

Red-crested cardinal (Junco cornutus)

Three individuals were seen in the Hanahou area along Plantation Road.

Kentucky cardinal (Richmondena cardinalis)

One individual was seen in the Fallowed Field Mixed Herb Association.

**Passeriformes**

Francolinus (Francolinus sp.)

About 30 were seen in the Abandoned Cane Fields near Kualoa Gulch in the hanahou portion of the property. These birds run and hop too quickly for a positive identification to species.

Ring-necked pheasant (Phasianus colchicus)

Three pairs were flushed from the Abandoned Cane Fields and one pair was flushed from the Fallowed Field along Plantation Road.

**Procellaria**

House finch (Carpodacus mexicanus)

About 20 were seen in the property, mostly along the roadsides.

Orange-crowned wren (Certhioa olivacea)

These were seen in small numbers in the Fallowed Field Mixed Herb Association, Abandoned Fields and along the roadsides.

Black-headed sparrow (Lonchura malacica)

Black-backed sparrow were seen in moderate numbers in the Abandoned Cane Fields, Fallowed Field comminution and along the roadsides.

**Zosterops**

Rice birds (Zosterops palmarum)

Rice birds were seen in moderate to small numbers in all but two plant communities. They were most common along the roadsides and in the Fallowed Field Grassland Association.

**Passeriformes**

Red-winged blackbird (Agelaius phoeniceus)

This is the most widespread species in the site. It was found in small to moderate numbers in all vegetation types except the Cultivated Fields.

**Sturnidae**

Common myna (Acridotheres tristis)

Only three were seen in the Abandoned Cane Fields in the hanahou portion of the property.

**Zosterops**

Japanese white-eye (Zosterops japonicus)

Japanese white-eyes were seen in small numbers mostly along the roadsides.
SOPHIST

The vegetation on the project site consists of sugar cane, lowland shrubs and herbs and grasses. The vast majority of the 91 species recorded from the property is non-native. Only three native species (one endemic, two indigenous) and two possibly indigenous species were encountered but with the exception of the endemic koʻolauʻala these were present in moderate to large numbers. Native species constitute a rather significant element of the vegetation. However, no native plant communities are present. As a result of decades of sugar cultivation the vegetation is entirely secondary and the native (ʻōheʻo, puʻuohiʻa) or possibly native (ʻōheʻo, puʻuohiʻa) species which are so common on the site are nearly completely altered habitat. According to the U.S. Fish and Wildlife Service the endangered species koʻolauʻala can also be excluded as secondary in origin.

The various plant communities in the site serve as an excellent refuge and feeding site for 17 bird species. Fifteen are introduced (urban, field or game birds), one is indigenous (black-crowned night heron) and one is a common migratory species (Pacific golden-plover). Many of the birds including the plower are present in moderate to large numbers.

The proposed project will result in the loss of large numbers of ʻōheʻo, puʻuohiʻa, ʻōheʻo and ʻōheʻo. These are all common lowland species and their loss is not considered a significant loss to the native flora. The project will also result in the loss of habitat for a large number of Pacific golden-plovers and two black-crowned night herons. At least 30 individuals of the endangered koʻolauʻala will be affected by the project. The disposition of these will be determined through consultation with the State of Hawaiʻi Division of Forestry and Wildlife as prescribed by the Hawaii Endangered Species Law.

CONSIDERATIONS

Because of the presence of the federally endangered koʻolauʻala in the project site, consultation with the Hawaii State Department of Land and Natural Resources Division of Forestry and Wildlife is required under the provisions of the State Endangered Species Law before any grading can commence. Similar discussions with the U.S. Fish and Wildlife Service is also recommended. These consultations will essentially determine the fate of the proposed project and what mitigating measures will be required to preserve the koʻolauʻala.
PLANT SPECIES CHECKLIST

Families are arranged alphabetically in two groups: Monocotyledons and Dicotyledons. Genera and species are arranged alphabetically within each family. Taxonomy, common names and status follow those of Neal (1965), St. John (1973) or Harper et al. (1990). The abundance determinations are relative and are subject to the judgment of the investigator.

EXPLANATION OF SYMBOLS

Species Status:
- E - Endemic to the Hawaiian Islands, i.e., occurring naturally nowhere else in the world.
- I - Indigenous, i.e., native to the Hawaiian Islands but also occurring naturally elsewhere.
- X - Exotic (alien), i.e., plants introduced after the Western discovery of the islands.
- P - Polynesian introductions, i.e., plants introduced before the Western discovery of the islands.

Relative Abundance Ratings:
- A - ABUNDANT, generally the major or dominant species in a given area.
- C - COMMON, generally distributed throughout a given area in large numbers.
- O - OCCASIONAL, generally distributed through a major portion of a given area, but in small numbers.
- B - BIDDEN, observed uncommonly but more than 10 times in a given area.
- R - RARE, observed 2 to 10 times in a given area.

Vegetation Types:
- ACN - Abandoned Cane Fields
- FC - Fallowed Fields Mixed Herb Association
- FG - Fallowed Fields Grassland Association
- A - Abandoned Fields
- C - Cultivated Fields
- CR - Grasslands
- GU - Gulch Association
- R - Roadside Vegetation

ANIMAL SPECIES CHECKLIST

Families are arranged alphabetically and genera and species are arranged alphabetically within each family. Taxonomy follows that of Berger (1981). Quantitative techniques were not employed and thus only presence is recorded in each vegetation type.

EXPLANATION OF SYMBOLS

Species Status:
- M - Migratory species.
- I - Indigenous, i.e., native to the Hawaiian Islands but also occurring naturally elsewhere.
- X - Exotic (alien), i.e., species introduced after the Western discovery of the islands.

Vegetation Types:
- ACN - Abandoned Cane Fields
- FC - Fallowed Fields Mixed Herb Association
- FG - Fallowed Fields Grassland Association
- A - Abandoned Fields
- C - Cultivated Fields
- CR - Grasslands
- GU - Gulch Association
- R - Roadside Vegetation
The table contains data related to the topics of [insert relevant information here]. Each row and column represent specific categories and subcategories, with numerical or categorical values provided in the cells. The table structure helps in analyzing and comparing different aspects of the subject matter efficiently.
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Because the plant is attractive and is easy to cultivate (seeds and cuttings), it was once sold by several plant nurseries as "red 'Ilima" prior to its listing.

A new population of the ko'olau'a ula was recently discovered by Hagata while conducting a survey of the MTRC's East Kapolei project site in September and October 1996. Hagata recorded at least 38 ko'olau'a ula plants from the southwest corner of the project site (Figure 1). Collections of the plants were deposited by Hagata at the Bishop Museum.

A survey to verify and to more accurately inventory and map the plants found by Hagata was conducted in December 1996. This survey followed an unusually heavy rainfall in November 1996 which lasted for about 10 days.

RESULTS

Three colonies of plants were identified in the field and mapped (Figure 2). We could not locate the northern-most colony mapped by Hagata.

Colony A: This colony consists of 6 large, nature (flowering/budding) plants, 7 to 6 ft. tall, and 2 juvenile (young, immature) plants, 1 to 1.5 ft. tall.

Colony B: This colony is found along the golf course fence. About half (11 plants) are composed of juvenile plants, most of which have probably sprouted and grown since the November rains. The remaining plants (10) are nature individuals.

Colony C: This is the largest colony and is found near the power
DISCUSSION AND RECOMMENDATIONS

A total of 88 keʻōlaʻula plants were found during the recent study to flag and inventory the plants on the East Kapaʻili site. There are a large number of juvenile plants, most of which sprouted and established themselves since the unusually heavy rainfall in November 1996. The number of plants will most likely increase during the rainy season (November 1996 to about February 1997).

It is recommended that a mitigation plan be initiated as soon as possible as the mature plants will continue to set seeds and the colonies will continue to expand in area.

The larger plants can be easily cultivated from seeds and cuttings while the smaller plants can be dug up and transplanted. It is recommended that an area be set aside for the conservation of these plants. An excellent location would be within the power line corridor. A greenway or belt of vegetation with the keʻōlaʻula could be established here. A few plants already occur within this corridor.

References


Appendix C.
Botanical Survey
W. Char
(October 1997)

BOTANICAL RESOURCES STUDY
NORTH-SOUTH ROAD CORRIDOR
(H-1 Freeway to Kapolei Parkway)
'Ewa District, Island of O'ahu

by

Winona P. Char
CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawaii

Prepared for:
PARSONS BRINCKERHOFF

October 1997
INTRODUCTION

The botanical resources found on the North-South road corridor from its proposed interchange with Interstate Route H-1 to its terminus at the proposed Kapolei Parkway is presented in this report. The majority of the alignment crosses sugar cane fields which are no longer in cultivation. Although sugar cane cultivation ceased two to three years ago, there are still a few remnant clumps of sugar cane in the area between Farrington Highway and Waimanalo Road. However, in most places the former fields are now overgrown with Guinea grass or mixed scrub vegetation. A narrow band of koa haole scrub can be found along old irrigation ditches, drainage ways, and roadways.

A reconnaissance-level field study was conducted in June 1994, and later in December 1994 during the rainy season. The primary objectives of the field studies were to:

1) provide a description of the vegetation found on the undeveloped portions of the corridor;
2) inventory the flora;
3) search for threatened and endangered plants as well as species of concern; and
4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

One Federal and State listed endangered species, the koʻōlowʻula (Abutilon monilefii), was found during the field studies and is discussed in more detail in the "Endangered Plants" section of the report.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. The roadway alignment maps and a recent color aerial photograph of the study area were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

A walk-through survey method was used. Notes were made on plant distributions and associations, substrate types, drainage, topography, exposure, etc. Plant identifications were made in the field, plants which could not be positively identified were collected for later determination in the herbarium (University of Hawaiʻi, Hano - MAN), and for comparison with the recent taxonomic literature.

The species recorded during the field studies are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the studies. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual taxa.

DESCRIPTION OF THE VEGETATION

In the U.S. Fish and Wildlife Service sponsored "Koa Plaing", Botanical Survey (Char and Balakrishnan 1979), the vegetation along the roadway corridor was mapped as "C", sugar cane fields.
On areas which were not actively cultivated, koa haole shrubland and mixed grass-shrubland were found. Since that survey, O'ahu Sugar Company, Ltd., has ceased cultivating the fields, and much of the 'Ewa Plains has been developed for the second city of Kapolei.

In the discussion below, the vegetation along the proposed North-South road corridor is described from makua to makai, that is, from its proposed interchange with Interstate Route H-1 to its makai terminus at Kapolei Parkway. Locations are referenced to existing roads and landmarks on the corridor had not been flagged and staked at the time of the field studies. A checklist of all those plants inventoried during the field work is presented at the end of the report.

Vegetation along the corridor

At the interchange with H-1, dense koa haole shrubs (Kaucoma hebecocarpa) border the highway and cover the southwest portion of the interchange. Clumps of Guinea grass ( Panicum maximum ) 3 to 5 ft. tall, form a thick cover between the shrubs. Scattered through this koa haole/Guinea grass scrub are trees of kiau ( Pprennis pallida ) and opioha ( Piptocomebium dulce ). Along kai'a Gulch, there are a few Java plum ( Syzygium cumini ) and kukui ( Aleurites moluccana ) trees among the koa haole thickets. Uplands of the highway are former sugar cane fields now overgrown with Guinea grass and buffel grass ( Cenchrus ciliaris ).

Between Interstate Route H-1 and Farrington Highway, the former sugar cane fields are now overgrown with buffel grass. A few clumps of the taller Guinea grass can be seen scattered here and there. Koa haole shrubs and a few kiau trees line the edges of the grassy fields. A few of the fields had been planted earlier with other crops such as watermelons, but in December these fields were overgrown with low mats of pink bindweed ( Ipomoea triloba ) and clumps of other weed species such as cochlebur ( Euphorbia teretilis ) , apple of Peru ( Gloriosa superba ) , kahiko ( Euphorbia heterophylla ) , etc.

On the State-owned lands between Farrington Highway and Waianae Road, the cane fields were the most recently fallowed and so there are still a few areas with remnant clumps of sugar cane plants (Saccharum officinarum ) , from 3 to 7 ft. tall, where the plants collect runoff water in low lying areas. The sugar cane cover is somewhat dense, and where the soil is drier and cracked, there are only dead, dried out clumps of cane. The abandoned fields have been invaded by a mixed scrub composed of swollen fingergrass ( Chloris barbata ) and a number of other weed species which include 'uliena ( Malabara indica ) , 'ilima ( Sidefisalis ) , kahiko ( Euphorbia teretilis ) , currant tomato ( Lycoctonum spicata ) , Guinea grass, lion's ear ( Euphorbia heterophylla ) , coast button ( Frida pemphigosa ) , pink bindweed, castor bean ( Gloriosa superba ) , etc. In some places, Guinea grass has formed a dense cover, 3 to 6 ft. tall, with only a few other species present. Kalo'ol and Makikilo Gulches, now reduced to somewhat narrow drainage channels, support koa haole shrubs and thicketed ivy gourd vine ( Coccinia grando ) .

ENDANGERED PLANTS

Because the 'Ewa Plains have been extensively disturbed by agricultural activities for such a long period of time, there are few places which support native plant communities. The few places with native plants tend to be found on areas with karst or limestone topography, since these areas do not have soil and they were unsuitable for agriculture. Two listed endangered species which occur today within such habitats are the 'Ewa Plains 'akoko ( Chamaesyce...
and Achyranthes rotyulata. Both are found only on limestone sites within Campbell Industrial Park and Barbers Point Naval Air Station (Char and Balakrishnan 1979; Traverse Group, Inc., 1988). One plant of the endangered ko‘olen‘ula (Abutilon sempervirens) was found in an overgrown sugar cane field near Kalakaua Boulevard in the industrial park (Char and Balakrishnan 1979; Wagner et al. 1980; U.S. Fish and Wildlife Service 1994). There are historical records of two listed endangered species, the ‘auwai (Centaurium sehneidii) and ‘iba‘iba (Hormielia villas), and two species of concern, the ‘ibhi (Pentascale villas) and pu‘uka‘a (Torrilium odoratum ssp. auriculatum), in the vicinity of the proposed corridor (R. Harper, USFWS, 01 February 1996 letter).

During the field studies for the State Housing Finance and Development Corporation’s (SHFDC) East Kapolei project, in September and October 1996, 38 plants of the endangered ko‘olen‘ula were found by Ken Nagata, botanist, on the southwest corner of the SHFDC project site. The plants occur primarily in mixed scrub and also in areas with remnant clumps of sugar cane. A survey to verify the findings and to more accurately inventory and map the plants was conducted in December 1996 (Char 1997). This December survey followed an unusually heavy period of rainfall in November 1996 in which the “Ewa area received more than 20 inches of rainfall in about 10 days; average rainfall for the “Ewa area is 20 inches per year.

A total of 88 ko‘olen‘ula plants were flagged and inventoried; the plants occur in three colonies, located fairly close to each other. A large number of juvenile plants which had sprouted after the November rains were found. Some of the ko‘olen‘ula plants lie within the proposed North-South road corridor where it follows near the existing REED powerline (Figure 1).
DISCUSSION AND RECOMMENDATIONS

The majority of the proposed North-South Road corridor will cross over former sugar cane fields now overgrown with weedy scrub and scattered ko'olau'ula chichitas. These areas have little of botanical interest as they have been disturbed (under cultivation) for a long period of time and are dominated by introduced or alien plant species. The only area of concern is that portion of the corridor which will cross through the endangered ko'olau'ula population.

A mitigation plan which would relocate the affected ko'olau'ula plants is being prepared.

LITERATURE CITED


SPECIES LIST -- North-South Road Corridor
(H-1 Freeway to Kapolei Parkway)

The following checklist is an inventory of the plants observed
on the undeveloped lands within the proposed roadway corridor.
The plants are arranged alphabetically by families within each of
two groups: Dicots and Monocots. The taxonomy and nomenclature
of the flowering plants follow the most recent treatment of the
Hawaiian flora by Wagner et al. (1990) and new additions to the

The following information is provided for each species:
1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:
   E = endemic - native only to the Hawaiian Islands.
   I = indigenous - native to the Hawaiian Islands and also
      elsewhere throughout the Pacific and/or tropics.
   IF = questionably indigenous - data not clear if introduced
      or if arrival here by natural means, but weight of
      evidence suggests probably indigenous.
   P = Polynesian - plants originally of Polynesian introduction
      prior to Western contact (Cook’s discovery of the Islands
      in 1778).
   X = introduced or alien - all those plants brought to the
      Islands by humans, intentionally or accidentally, after
      Western contact (1778).
   X? = questionably introduced - dates of introduction unclear
       or very early, may be indigenous or of Polynesian
       introduction.

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<tr>
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</tr>
<tr>
<td>CONVOLVULACEAE (Morning-glory family)</td>
<td><strong>Ipomea obscura (L.) Ker-Gawl.</strong></td>
<td>field bindweed, pink bindweed, little wall lizard</td>
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<tr>
<td><strong>Iponnea triloba L.</strong></td>
<td>hairy ipomoea, koali bus Hulu, kula Hulu</td>
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<tr>
<td><strong>Heremia aegyptia (L.) Urb.</strong></td>
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<tr>
<td>CUCURBITACEAE (Gourd family)</td>
<td><strong>Coccinia grandis (L.) Vogt</strong></td>
<td>tiny gourd, scarlet-fruited gourd</td>
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<tr>
<td><strong>Monardica charonia L.</strong></td>
<td>willed bitter melon</td>
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<tr>
<td>EUPHORBIEACEAE (Spurge family)</td>
<td><strong>Alacrites novocrassa (L.) Hildr.</strong></td>
<td><em>kukul, tuau</em></td>
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<tr>
<td><strong>Chamaesyce hirta (L.) Hildr.</strong></td>
<td>hairy spurge</td>
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<tr>
<td><strong>Chamaesyce hypericifolia (L.) Hildr.</strong></td>
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<tr>
<td><strong>Chamaesyce prostrata (Ait.) Snell</strong></td>
<td>graceful spurge</td>
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<tr>
<td><strong>Euphorbia heterophylla L.</strong></td>
<td>prostate spurge</td>
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<tr>
<td><strong>Phyllanthus debilis Klein ex Willd.</strong></td>
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<tr>
<td><strong>Ricinia communis L.</strong></td>
<td>mirturi</td>
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</tr>
<tr>
<td><strong>FABACEAE (Pea family)</strong></td>
<td><strong>Crotalaria incana L.</strong></td>
<td>cassava bean, pa'alia, kola</td>
</tr>
<tr>
<td><strong>Crotalaria pallida Aiton</strong></td>
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<tr>
<td><strong>Deinostachys virgata (L.) Willd.</strong></td>
<td>fuzzy rattlepod, kukaa-bot</td>
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<tr>
<td><strong>Indigofera suffruticosa Mill.</strong></td>
<td>smooth rattlepod, pika-bot</td>
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<tr>
<td><strong>Indigofera spicata Forssk.</strong></td>
<td>slender mimosa</td>
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<tr>
<td><strong>Leucospermum grandiflorum (L.) Benth.</strong></td>
<td>indigo, 'umuko</td>
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<tr>
<td><strong>Macroglossum lathyroides (L.) Urb.</strong></td>
<td>creeping indigo</td>
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<td><strong>Phaseolus ap.</strong></td>
<td>mua hale</td>
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<tr>
<td><strong>Pithecellodium dulce (Kunth.) Benth.</strong></td>
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<tr>
<td><strong>Prosopis pallida (Humb. &amp; Bonpl.) ex Willd.) Kunth</strong></td>
<td><em>''options</em></td>
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<tr>
<td><strong>Senna pendula (Humb. &amp; Bonpl. ex Willd.) H. Irwin &amp; Barneby</strong></td>
<td>kiawe</td>
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<tr>
<td><strong>LABACEAE (Citrus Family)</strong></td>
<td><strong>Leonotis nepetifolia (L.) R. Br.</strong></td>
<td>senna</td>
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<td><strong>MALVACEAE (Mallow family)</strong></td>
<td><strong>Abutilon grandiflorum (Willd.) Sweet</strong></td>
<td>hairy abutilon, ma'o</td>
</tr>
<tr>
<td><strong>Abutilon incanum (Link) Sweet</strong></td>
<td><em>ma'o</em>, hoary abutilon</td>
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<tr>
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<tr>
<td><strong>Abutilon mentesijsi Seen.</strong></td>
<td>ko'olua'ulu</td>
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<tr>
<td><strong>Heliotropium coronamontanum (L.) Garcke</strong></td>
<td>false calony</td>
<td>X</td>
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<tr>
<td><strong>Sida fallax Volp.</strong></td>
<td><em>'ilima</em></td>
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<tr>
<td><strong>Sida rhombifolia L.</strong></td>
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<tr>
<td><strong>MYRTACEAE (Myrtle family)</strong></td>
<td><strong>Syzygium cumini (L.) Skeels</strong></td>
<td>Java plum</td>
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<tr>
<td><strong>NYCTAGINACEAE (Four-o'clock family)</strong></td>
<td><strong>Boerhavia coccinea Willd.</strong></td>
<td>red-flowered boerhavia</td>
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<td><strong>PASSIFLORACEAE (Passion flower family)</strong></td>
<td><strong>Passiflora foetida L.</strong></td>
<td>running pop, pohapaha</td>
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<tr>
<td><strong>PORTULACACEAE (Purslane family)</strong></td>
<td><strong>Portulaca oleracea L.</strong></td>
<td>pigweed, <em>'akaliiki</em> hula</td>
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<tr>
<td><strong>SOLANACEAE (Nightshade family)</strong></td>
<td><strong>Lycopersicon pimpinellifolium (Aust.) Hill.</strong></td>
<td>current tcnato</td>
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<tr>
<td><strong>Nicandra physalodes (L.) Gaertn.</strong></td>
<td>apple of teru</td>
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<tr>
<td><strong>Nicotiana glauca R.C. Graham</strong></td>
<td><em>tite</em> tobacco, paka</td>
<td>X</td>
</tr>
<tr>
<td><strong>Solanum americanum Hill.</strong></td>
<td><em>glowy nightshade</em>, <em>popolo, 'aloahu</em></td>
<td>X</td>
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<tr>
<td><strong>STERculIACEAE (Cacao family)</strong></td>
<td><strong>Waltheria indica L.</strong></td>
<td><em>'aholoa, hi'alana, kanakawalo</em></td>
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<tr>
<td><strong>ZYGOPHyllACEAE (Crescent bush family)</strong></td>
<td><strong>Triobulus terrestris L.</strong></td>
<td>puncture vine, goat head</td>
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</table>

| MNHOTTS | | |
| **CONVOLVULACEAE (Morning-glory family)** | **Abutilon grandiflorum (Willd.) Sweet** | hairy huluhulo | X |
| **CYPERACEAE (Sedge family)** | **Cyperus rotundus L.** | nut sedge, nutgrass | X |
| **FACCIE (Grass family)** | **Buchloea dactyloides (L.) A. Camus** | pitted broomgrass | X |
| **Cyperus rotundus L.** | California grass | X |

11 12
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<th>Common name</th>
<th>Status</th>
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<tbody>
<tr>
<td>Cynodon dactylon (L.) Pers.</td>
<td>lespedeza</td>
<td>X</td>
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<tr>
<td>Digitaria insularis (L.) Mez. ex Stearn</td>
<td>sedge</td>
<td>X</td>
</tr>
<tr>
<td>Klerouxia indica Goetgh.</td>
<td>sedge</td>
<td>X</td>
</tr>
<tr>
<td>Lepsochloa minuscula (Presl.) Hitchc. &amp; Chase</td>
<td>sedge</td>
<td>X</td>
</tr>
<tr>
<td>Melinis repens (Willd.) Zlacz.</td>
<td>sedge</td>
<td>X</td>
</tr>
<tr>
<td>Paniceum maximum Jacq.</td>
<td>sedge</td>
<td>X</td>
</tr>
<tr>
<td>Saccharum officinarum L.</td>
<td>sedge</td>
<td>X</td>
</tr>
<tr>
<td>Setaria verticillata (L.) Beauv.</td>
<td>sedge</td>
<td>X</td>
</tr>
<tr>
<td>Sorghum halepense (L.) Pers.</td>
<td>sedge</td>
<td>X</td>
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</table>

Appendix D
Botanical Survey
W. Char
(August 2003)
BOTANICAL SURVEY
UNIVERSITY OF HAWAII'S WEST O'AHU
EAST KAPOLEI, 'EWA DISTRICT, O'AHU

by

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawaii

Prepared for:
PUR HAWAII
August 2003

INTRODUCTION

In mid-September 2002, the University of Hawaii's Board of Regents selected the 500-acre Kapolei Nui site as the permanent site for University of Hawaii's West O'ahu campus. The 500-acre project site is bounded by Farrington Highway to the north; the proposed North-South Road to the east; overgrown, former sugar cane field to the south; and the Kapolei residential area and Kapolei Golf Course to the west. A large portion of the 500-acre project site has recently been cleared for vegetable crops or is already under cultivation by Ahau Farms. The Kalua'ip and Hauhoahe Gulches cross the property. Scrub vegetation is found on the former cane fields on the lower southern portion of the site. A few plants of the endangered pa'au'a (Sambucus minor) are associated with the scrub vegetation.

Field studies to assess the botanical resources on the proposed University of Hawaii's West O'ahu campus site were conducted from 17 to 20 June 2003. The primary objectives of the field studies were to:
1) prepare a general description of the vegetation on the site;
2) inventory the flora;
3) search for threatened and endangered species as well as species of concern; and
4) identify areas of potential environmental problems or concern and propose appropriate mitigation measures.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Topographic maps and a recent, colored aerial
photograph (1" x 200") were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

The areas with scrub and gash vegetation were surveyed more extensively as they were more likely to harbor native plants. A few plants of the endangered *baldia* (*Maclura melanotis*) occur on the project site; larger clusters of plants are found on the adjacent lands. All of the *baldia* plants, both on and off the project site, have been mapped and flagged during earlier studies. The plants are monitored periodically by staff from the State Division of Forestry and Wildlife (DOFW). Actively cultivated farm lands were not surveyed in detail as rare plants were not likely to occur in such areas.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, disturbances, topography, exposure, drainage, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium and for comparison with the most recent taxonomic literature.

The species recorded are indicators of the season ("dry" vs. "wet") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight differences in the species list, especially of the weedy, annual plants.

**DESCRIPTION OF THE VEGETATION**

Nagita (1996) conducted a biological survey (flora and fauna) for the approximately 1,200-east Haupu Kailani Peak project site. This study covered the proposed 500-or 190-foot O'ahu property. In was during the field survey in September and October 1996 that Nagita discovered the endangered *baldia* plants (see "Endangered Species" section in this report for discussion). In the 1996 study, large portions of the East Kapalai site supported abandoned sugar cane fields with sugar cane (Saccharum officinarum) making up 30 to 50% of the total vegetation cover. In other places, sugar cane made up less than 5% of the cover with mixed herbs and grasses abundant. A botanical survey for the proposed North-South Road (H-3) project 1997 recorded similar vegetation types.

Today, large areas with sugar cane are no longer present on the study site, having been replaced by a scrub vegetation composed primarily of sawtooth fingergrass (*Sphagneticola trilobata*), mixed herbaceous species, and small shrubs (*Exacum*) and the land on the northern portion of the site, adjacent to Farrington Highway, are under cultivation by Aloun Farms.

Three vegetation types are recognized on the UI West O'ahu site in this report. An inventory of all the plant species observed during the field studies is presented at the end of the report.

**Agricultural Area**

Actively cultivated fields make up the agricultural farm lands vegetation type which covers the majority of the 500-or project site. Most of the large fields bordering Farrington Highway have recently been bulldozed to clear them of weedy growth and were being disked during our field survey in June. Short stumps of the sugar cane (Saccharum officinarum) could be observed here and there in these fields. On the planted fields on the eastern portion of the site, hybrid sweet cane (Saccharum spp. cv. "Green") covers large areas. Other crops observed include cattleya (Cattleya amara cv. "Green"); papaya (Carica papaya); a number of different melon cultivars such as watermelon and that watermelon (Citrullus lanatus), and cantaloupe and honeydew (Cucumis melo); cultivars of *Saccharum* spp. — sugar, queens, papaya; and yard-long bean (Vigna unguiculata).

A few weed species such as cotton (Gossypium spp.), *Sphagneticola trilobata*, and *Crotalaria juncea* can be found growing among the crop plants. Most of the weed plants, however, occur along the unoccupied areas which border the fields; these weedy patches receive runoff from the cultivated fields so the weeds tend to...
Scrub vegetation

This vegetation type occupies the southern portion of the project site and is usually 1 to 3 ft. tall. Long dead stalks of sugar cane are scattered throughout this vegetation type. At the time of this survey, the project site was very dry with plant cover 5 to 10%. Bare soil areas with large, deep cracks were prominent and made surveying difficult.

Several grasses are the most abundant species forming fairly large patches. In some places, buffelgrass (Cenchrus ciliaris) becomes locally abundant and forms a thick mat, 2 to 3 ft. tall. Four herbaceous species are abundant to common, these are false mallow (Malvastrum ciliatum), castanopsis (Frisia procumbens), fuzzy saltbush (Atriplex hastata), and golden crown-beard (Verbesina encelioides). Small shrubs of hairy shrub (Atriplex hastata), 'alalea (Hippophae rhamnoides), and 'anana (Hippophae rhamnoides) and 'alana (Hippophae rhamnoides) and 'alana (Hippophae rhamnoides) are abundant; these small shrubs have fuzzy, gray to bluish-gray leaves, and give a grayish-blue cast to the vegetation where they form extensive patches, 1 to 3 ft. tall.

Scattered throughout this scrub cover are taller shrubs of kahe hale and storoth (Phorodon geranifolium), 3 to 10 ft. tall. Other woody components found here in small numbers are young sages (Salvia sp.) and 'upena (Phorodon geranifolium) trees, 3 to 12 ft. tall. Interestingly, a few species usually used as landscaping material have established themselves within these former cane fields; these are the small crown flower (Salvia sp.), cardon flower (Carnegia gigantea), and Sebastia plum (Sebastia plumifolia).

In the old, stunted coral-covered cane haul roads and along irrigation ditches, the vegetation is somewhat denser. Two hale shrubs and Galine grass are common. Other species forming fairly large patches here include saltbush (Atriplex spp.), 'alalea, slender alabas (Pluchea streptocarpa), Moonworts (Monanthium fruticosum), Natal saltbush (Atriplex recurvata), 'alana, and saltbush fingergrass.

Along the lower boundary (kuai iau), especially along the North-South Road corridor, there are a few plants of the endangered 'ana kula within the project site. A more detailed discussion of the 'ana kula plants on the project site is presented in the "Endangered Species" section of the report.

Saltbush vegetation

Kehi'1 Gulch and Honokea Gulch cross the project site. In most places, the gulches are shallow and narrow. However, Kehi'1 Gulch becomes 25 to 45 ft. deep and wider along its eastern segment. A large plunge pool with standing water was found during the field studies. The intermittent streams along the bottom of each of the gulches have eroded down to the hardpan parent material.

The vegetation within the gulches (sides and bottom) is characterized by dense, robust clumps of Galine grass, 5 to 30 ft. tall. The dense Galine grass cover tends to exclude other species, but a few patches of California grass (Bromus inermis), burrbrush, cactus bor (Cotlrornia), wild barley (Hordeum murinum), cardon flower (Carnegia gigantea), and cardon flower (Carnegia gigantea) are found where the Galine grass cover is thin and the soil exposed.

Along the top banks of the gulches, buffelgrass forms a whitish mat up to 3 ft. tall, but Galine grass can also be abundant in places. Sea hale shrubs, 10 to 20 ft. tall, occur as scattered stands or can sometimes become very dense and form small thickets, especially along the eastern section of Kehi'1 Gulch.
Tangled mats of cocoma vine (Cecropia graminifolia) are frequently observed climbing up and over the kalo Kane shrubs. A few stilt trees, 20 to 25 ft. tall, are also found along the top of the gallery.

ENHANCED SPECIES

The ha'olehau (Austrobaileya Ulmannii) is a member of the hibiscus or mallow family (Malvaceae). It is a multi-branched shrub covered by velvety, silvery hairs. The heart-shaped leaves are silvery-green and the small, yellow-like flowers range in color from pale peach to dark red. ANTHILL is found in dry, inland habitats on the islands of O'ahu, Maui, Lana'i, and Niihau (Panzer et al. 1995). In 1996, the species was federally listed as endangered and is protected under the provisions of the Endangered Species Act of 1973, as amended, and Chapter 195, Hawaii Revised Statutes, as amended. In its natural habitat, the plant is threatened by browsing animals, competition from weeds, introduced weeds, fires, predation by insects, loss of native pollinators, and development (U.S. Fish and Wildlife Service 1994).

In September 1994, Napa'a found 39 Austrobaileya Ulmannii plants on the East Kapolei project site; the predevelopment survey covered roughly 50% of the property. After the unusually heavy rains in November 1994, Ota (1995) conducted an intensive inventory of the plants in December and recorded a total of 98 plants. A year later, in December 1995, Napa'a performed a detailed survey flagging and attaching numbered tags to the plants; survey engineers then mapped the plants. The 1997 survey recorded 83 plants, 83 from the East Kapolei site and North-South Road corridor and one plant within the boundary of the adjacent City and County-owned golf course.

In 1998, a Habitat Conservation Plan (HCP) was prepared for the East Kapolei Master Plan; the HCP is an "umbrella plan" that includes the East Kapolel project as well as the North-South Road project. The HCP provides a description of the development action which would impact the Austrobaileya Ulmannii plants and proposes a series of mitigation strategies to address the impacts (FHWA 1998).

A few of the endangered Austrobaileya Ulmannii plants occur on the proposed 156-acre West O'ahu site. These represent the most recent extension of the Cluster C population. One plant remained at the Cluster D site in Napa'a's 1997 study, but it has subsequently died (St. Carey, USFWS, pers. comm.). There may still be some of Austrobaileya Ulmannii in the soils around Cluster D. The Austrobaileya Ulmannii population is periodically monitored by the Division of Forestry and Wildlife (G. Hanster, pers. comm.).

DISCUSSION AND RECOMMENDATIONS

The proposed 156-acre West O'ahu site was under sugar cane cultivation for nearly a century with the last harvest occurring in 1994, prior to permanent closure of the Kona Sugar Company. In 1955 (FHWA 1998), only, only dead stalks of sugar cane and faint traces of planting furrows remain. Napa'a scrub vegetation consisting of a mixture of waiawa (Fagopyrum esculentum), yellow croton (Codiaeum variegatum), and small shrubs covers the former cane fields on the southern half of the property, while the northern portion is actively cultivated for various fruit and vegetable crops by Atulon Farms. The gulches which cross the site support dense guama grass and stands of ha'ole shrubs.

The vegetation on the project site is dominated by introduced or alien species. A total of 95 plant species were observed during this study. Of these 89 (93%) are introduced; introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact. Of this 93%, 14% are indigenous or prehistorically indigenous, that is, they are native to the islands and elsewhere; these are the 'Aloha (Rhipsalis balbisiana), hevea huliana (Austrobaileya Ulmannii), 'ua'aua (Cordyline petiolaris), and pua'a kalo (Heliconia spathacea), two species are endemic, that is, they are native only to the Hawaiian Islands; these are the endangered ha'olehau (Austrobaileya Ulmannii) and pa'auhi (Austrobaileya Ulmannii subsp. peruviana).

None of the plants found on the project site, with the exception of the...
Ka'ala'alea is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1990a, 1999; Wagner et al. 1999). Almost all of the plants can be found in dry, lowland, disturbed habitat throughout the islands. Some of the natives such as the 'ilima, kauy ahalua, and maile are common in abundant throughout the scrub vegetation at the project site and elsewhere.

A Habitat Conservation Plan for the endangered ka'ala'alea plant on the 'Iwa site has already been prepared. Plant material from this population has been propagated and a few outplanting has been made at other locations. The University will need to work closely with the agencies involved in the Habitat Conservation Plan.

LITERATURE CITED


APPENDIX A

PLANT SPECIES LIST -- N.H. Velie O'alu

The following checklist is an inventory of all the plants observed on the project site during the field studies. The plants are arranged alphabetically by families into each of two groups: dicots and monocots. The taxonomy and nomenclature of the flowering plants, dicots and monocots, are in accordance with Wagner et al. (1990) and Wagner and Herbst (1993). The few recent name changes are those reported in the Hawaii Biological Survey series (Everharts and Elnorolde, editors, 1999-2002).

For each species, the following information is provided:
1. Scientific name with author citation.
2. Common English name and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:
   E = endemic = native only to the Hawaiian Islands;
   I = indigenous = native to the Hawaiian Islands and elsewhere;
   T = unquestionably indigenous = data not clear if dispersal to the islands by natural or human-related mechanisms, but weight of evidence suggests probably natural;
   I = introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that Cook's arrival in the islands in 1778;
   L = questionably introduced = dates of introduction are very unclear; may be indigenous or of Polynesian introduction.
4. Presence (+) or absence (-) of a particular species within each of three vegetation types recognized on the project site (see text for discussion):
   A = Agricultural/Farm Lands
   S = Scrub Vegetation
   G = Gulch Vegetation
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<td><strong>POISONOUS PLANTS</strong></td>
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<td>EUPHORBIEACEAE (Spurge family)</td>
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<tr>
<td>Euphorbia characias</td>
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<tr>
<td>Euphorbia amygdaloides</td>
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**PLANT FAMILY**

**DIOICOT**

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<th>Status</th>
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<tr>
<td>Asteraceae (Sunflower family)</td>
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<tr>
<td>Taraxacum officinale</td>
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**ANGIOSPERMS**

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<td>Cucurbitaceae (Cucumber family)</td>
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<td>Cucumis sativus</td>
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**RESEARCHER**

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<td>Solanaceae (Nightshade family)</td>
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<tr>
<td>Solanum nigrum</td>
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**CARYOPHYLLACEAE (Pink family)**

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<th>Scientific name</th>
<th>Common name</th>
<th>Status</th>
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<td>Euphorbia esula</td>
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**PAPilionACEAE (Pea family)**

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<td>Lathyrus sativus</td>
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**RANUNCULACEAE (Buttercup family)**

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**TILIACEAE (Tilia family)**

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<td>Hyacinthus orientalis</td>
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**CARYOPHYLLACEAE (Pink family)**

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**AMARANTHACEAE (Amaranth family)**

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<td>Amaranthus hybridus</td>
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**Cyperaceae (Cyperus family)**

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<tr>
<td>Cyperus esculentus</td>
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**EUPHORBIEACEAE (Spurge family)**

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<td>Agrostis stolonifera</td>
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<td>Bromus inermis</td>
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<td>Setaria viridis</td>
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<td>Zea mays</td>
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Legend:
- A: Annual
- A: Biennial
- A: Perennial
APPENDIX I

Water Quality Assessment, Southern Oahu Basal Aquifer (SOBA), Section 1424(e) Review
WATER QUALITY ASSESSMENT
SOUTHERN OAHU BASAL AQUIFER (SOBA)
SECTION 1424 (e) REVIEW

March 1997

Prepared for
State of Hawaii
Department of Transportation
888 Punchbowl Street
Honolulu, Hawaii 96813

City and County of Honolulu
Department of Transportation Services
Pacic Fan Pkwy
211 Kapahulu Avenue, Suite 1200
Honolulu, Hawaii 96813

March 1997

FECD Reference 12184: Product 8 11
EXECUTIVE SUMMARY

North-South Road, a proposed at-grade arterial roadway in the Ewa region of the island of Oahu, crosses the South-Oahu Basin Aquifer (SOBA), a designated Sole Source Aquifer. In accordance with the 1984 Sole Source Aquifer Protection Ordinance of Understanding between the Federal Highway Administration (FHWA) and the Environmental Protection Agency (EPA), this water quality assessment has been prepared to meet the coordination requirements of Section 402(b) of the Safe Drinking Water Act.

The SOBA is under tension pressure in the porous layer above the caprock, a wedge of alluvial sediments and limestone. The caprock layer is a thin distance from the shoreline, and at varying distances inland, the caprock layer ends, and the basalt layer, containing the SCBA, underlies surficial materials. Water quality in the SOBA is excellent and the SCBA is the primary source of drinking water on Oahu. Water in the caprock aquifers is too saline to be palatable.

The North-South Road project crosses the boundary between caprock and basalt. Without mitigation, roadway drainage and sediment spills could infiltrate into the SCBA or the northern portion of North-South Road, including the interchange with Interstate Route H-1. The caprock boundary lies approximately 300 - 450 m (1000 - 1500 ft) south of North-South Road's intersection with Farrington Highway.

The drainage system proposed for the mauka section of North-South Road and its intersection with Interstate Route H-1 could collect and convey roadway drainage and sediment spills along the roadway to a discharge into Kapiolani Stream approximately 450 m (1500 ft) south of Farrington Highway. The discharge point would be south of the caprock boundary, and therefore, would be located above caprock. In addition, hazardous spills would require immediate containment and clean up as required by State regulations. With the drainage system and these incident response procedures in place, ground vibration impacts of the new roadway on the SOBA would be minimal.
1. INTRODUCTION AND PROJECT DESCRIPTION

This water quality assessment has been prepared to meet the coordination requirements of the Section 1424(e) Review of Safe Drinking Water Act for the North-South Road project, in accordance with the U.S. Safe Drinking Water Act Memorandum of Understanding between FHWA and EPA. The water quality assessment is intended to provide EPA the necessary information to determine the project's impact on the quality of the groundwater in the Southern Oahu Basin Aquifer (SOBA), a safe source aquifer which was designated in November, 1997. As shown in Figure 1, most of southern Oahu overlaps the SOBA.

FHWA and the Highways Division of the Department of Transportation (SDOT) are proposing to construct North-South Road, a divided, four-lane arterial roadway in the Ewa region of the island of Oahu (Figure 2). The roadway would be aligned on a generally north-south orientation from the Interstate H-1 Freeway to Kapolei Parkway between the Villages of Kapolei and Ewa Villages. The proposed project also includes an interchange with the H-1 Freeway.

2. ENVIRONMENTAL SETTING OF THE EWALO PLAIN

The Ewa Plain is a level to gently sloping landscape composed of terrestrial sediments near the Waianae Mountains and marine limestone near the coast (Figure 3). In geologic cross section (Figure 4, approximately A to C on Figure 3), the terrestrial sequence, which consists of clay and mud derived from volcanic rock, is interbedded with coral limestone deposited during periods when the area was covered by the ocean. This wedge of sediments and sedimentary rock is referred to as "caprock." The caprock sequence is approximately 200 m (660 ft) thick at the shoreline.

The limestone layers are thickest at the shoreline and taper off towards the center of the island. Limestone layers in the caprock-coral aquifers because they are porous enough to contain groundwater. The uppermost caprock aquifer is blackish and is used for irrigation and industrial purposes in some areas of Oahu. The lower caprock aquifer is approximately as saline as the ocean and is used only for industrial purposes. Hydraulic conductivity in the upper caprock has been computed based on ideal response data to be 7620 m/day (50,000 ft/day) (Dawson, 1944) and 8146 m/day (50,658 ft/day) (Lehman, 1976). Using the computed rate of discharge along the coast, Yuen and Associates (1986) find these values to be high by an order of magnitude. They cite 250 to 1500 m/day (1650 to 9000 ft/day) as a reasonable hydraulic conductivity (Yuen and Associates, 1989, Yuen and Yuen, 1993).

The terrestrial clays and muds between the aquifers are impermeable to groundwater aquifers. They have low permeabilities and impede the flow of groundwater between the limestone.
aquifers. The aquifer has a hydraulic conductivity between 0.05 and 0.011 m/day (0.009 and 0.037 ft/day) (Tu and Lau, 1995).

Numerous wells have been drilled in the caprock in the project area and the location of these wells is shown on Figure 3. Table 1 (modified from Yuen and Associates, 1989) lists the depth to water in some of the wells used to map the extent of the caprock aquifer.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tr>
<td>Test Boreholes Hormuudl and Kopeitai Sectors</td>
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<tr>
<td>(meters (feet))</td>
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<tr>
<td>Well</td>
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<tr>
<td>Tri-1</td>
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<td>Tri-14</td>
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<td>Tri-15</td>
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</table>

The Eva Plain receives about 500 mm (20 inches) of rain each year. This rain, along with irrigation water and leachate from the underlying basalt aquifer (SCBA), recharges fresh water into the caprock aquifer. Irrigation water has been added to both the SCBA and the caprock aquifer.

Land use has played a large role in water quality in the caprock aquifer. Until recently, much of the Eva Plain was devoted to sugarcane cultivation. Changes in land use and agricultural practices began to occur in the early 1980s. Further irrigation was replaced by drip irrigation, and the amount of recharge to the caprock aquifer decreased. When the caprock aquifer did not receive as much fresh water recharge, it became more saline. A more drastic change has occurred with the urbanization of the Eva Plain. Except for golf course irrigation, the caprock aquifer is no longer recharged by irrigation water. Hydrological modeling (Unnik and Yuen, 1993) predicts that the salinity of the caprock aquifer will increase.

March 1997

Page 7

Facture 14
Underlying the caprock is the volcanic basement. It is approximately four million years old and contains the SCDA, a designated safe source aquifer. The SCDA occurs as a basal freshwater lens floating on salt water. The quality of the ground-water in this aquifer is excellent, and it is under artesian pressure because it is confined by the caprock. Because of the artesian pressure, water leaks upward from the SCDA into the caprock aquifer. Since artesian water was first discovered on Oahu, the artesian head has been lowered as a result of heavy pumping. When the first artesian well in the area was drilled in 1928, the maximum head was nearly 12.5 m (41 ft) above sea level. In 1958 the maximum head was 8.7 m (28.5 ft), and today it is less than 7.5 m (24.6 ft) above sea level (Macdonald, 1983).

The basin is composed of two layers of varying thickness and hydrologic properties. Taken as a unit, the basin is highly permeable with hydraulic conductivities in excess of 1000 m/d (1000 ft/d) (Mark and Lau, 1980). The top of the basin is 0.4 m thick and is derived from two deep marls, T-13 and T-131. These wells penetrated the entire caprock sequence and, along with some deep plantation wells and numerous shallow wells (see Table 1), are shown on Figure 3.

The SCDA, in the project area is in the Ponihoi Harbor Aquifer Sector and the Ewa Aquifer System. Based on historic water tables, the project area is a currently used source of fresh drinking water which is both replaceable and highly vulnerable to contamination (Mark and Lau, 1980).

All of the surficial surface of the Ewa Plains and the Farrington Highway has traditionally been classified as caprock. Yuen and Associates (1969), however, place the caprock boundary about 30.5 m (100 ft) south of the Farrington Highway as shown on Figure 3. Only a thin, patchy veneer of terrestrial alluvium overlay the basin north of this boundary. Yuen and Associates' more restrictive boundary is the inland margin along the surface trace of the intrusion of the volcanic basement with sea level. According to Yuen and Associates (1969), instead of this boundary recharge infiltrates into the underlying basin, which is underlain in alluvium or parent exposed limestone. Wherever the volcanic basement lies below sea level, there is no surface water to act as a confining aquitard.

3. GROUNDWATER ALONG THE PROJECT ALIGNMENT

The North-South Road alignment traverses the boundary between recharge area as shown on Figure 3. From the shoreline to about 30.5 m (100 ft) south of the Farrington Highway along the alignment, surface water recharge the caprock. In this area, the potential for contamination of the SCDA from surface water and activities occurring above the aquifer is low due to artesian conditions and the relative impermeability of the caprock. However, north of this boundary, which includes the interchange with Interstate Route H-1, the area which recharges the SCDA, in the area a thin veneer of terrestrial alluvium overlays the basin. Surface water may infiltrate into the SCDA in this area.

4. POTENTIAL IMPACTS AND MITIGATION DURING OPERATION

The proposed road would generate two waste streams: roadway pollutants and inadvertent spills, possibly containing hazardous materials. Roadway drainage contains a range of potential pollutants. North-South Road would include a drainage collection system which would carry the roadway drainage between the SCDA recharge area and a point approximately 200 m (660 ft) north of the interchange with Interstate Route H-1. This roadway drainage system would also collect and convey inadvertent material releases beyond the SCDA recharge area. In addition, hazardous waste procedures would be followed to minimize road construction. As such, such wastes would be collected and any hazardous material must be removed from the area. The drainage system and incident response procedures, impacts of the new roadway and interchange on the SCDA would be minimal.

The addition of impervious surface from paving of the highway would not have a significant impact on the quantity of recharge of the SCDA. A described above, rainfall in the area is sparse, and the extent of impervious surface being added is small in a regional context.

5. POTENTIAL IMPACTS AND MITIGATION DURING CONSTRUCTION

The project area was recently used for sugarcane cultivation, and therefore the project area could be potentially exposed to chemicals and pesticides. The area identified as potentially having a significant impact on the SCDA is in the area identified as potentially having a significant impact on the SCDA.

The reclamation and disposal of construction material would be required. The project area is the area identified as potentially having a significant impact on the SCDA.

6. REFERENCES


Mink and Yuan, Inc. Hydrogeological Impacts from Port Expansion of the Piers At Point Harbor, prepared for the Department of Transportation, July, 1993.


APPENDIX J

DRAINAGE REPORT
DRAINAGE REPORT

North-South Road (Kapolei Parkway to H-1 Freeway) and
Portion of Kapolei Parkway (Renton Road to North-South Road)
Ewa, Oahu, Hawaii

September 20, 2004

Prepared for:
Parsons Brinckerhoff Quade & Douglas, Inc.
1001 Bishop, Suite 2000
Honolulu, Hawaii 96813

Prepared by:
R. M. Towel Corporation
420 Waikamilo Road, Suite 411
Honolulu, Hawaii 96817

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   1.3.2 Scope

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   1.4.2 East Kapolei Drainage Master Plan, Draft Report, July 1998
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SECTION 1
INTRODUCTION

1.1 Project Overview

North-South Road and Kapolei Parkway are two roadways being proposed for development in the Ewa Plain of Oahu, Hawaii. The Location Map is shown in Figure 1-1. The Project Site Map is shown in Figure 1-2.

1.1.1 North-South Road

North-South Road is principal arterial proposed in a north-south direction in the so-called East Kapolei development area of the Ewa Plain. The roadway will connect Kapolei Parkway with the Interstate Route H-1 Freeway. This facility will consist of 3-lanes in each direction separated by a median and will be designed in accordance with design standards of the Hawaii State Department of Transportation (HIDOT) and the guidelines of American Association of State Highway Officials (AASHTO) for urban arterials.

A new conventional diamond configuration interchange will be constructed at the Interstate Route H-1. Right-of-way has also been set aside for future expansion into a modified partial cloverleaf interchange. All grade intersections will be constructed at Farrington Highway, Kapolei Parkway and at two future collector roadways between Farrington Highway and Kapolei Parkway.

1.1.2 Kapolei Parkway

Kapolei Parkway is a minor arterial proposed on the Ewa Plain. This study covers the portion of Kapolei Parkway between Rexton Road and North-South Road. This facility will consist of 3-lanes in each direction separated by a median. Design will be in also in accordance with HIDOT standards and AASHTO for urban arterials.

1.2 Background

This report is based on the existing and proposed drainage conditions as described in the East Kapolei Drainage Master Plan dated July 1999.

1.3 Purpose and Scope

1.3.1 Purpose

This purpose of this report is to describe the proposed drainage plans for North-South Road and Kapolei Parkway and to assess related drainage benefits and impacts.

1.3.2 Scope

The scope of this report includes an evaluation of existing, interim and ultimate drainage conditions for the project.

1.4 Related Studies

This report is based on the plans, assumptions and data of previous drainage plans in the Ewa area, including:

1.4.1 Ewa Villages Drainage Master Plan, March 1997

This report was prepared in support of the Ewa Villages Revitalization sponsored by the City and County of Honolulu. It contains evaluation of existing watershed conditions and defined most of the Ewa Watershed subareas and drainage patterns.

1.4.2 East Kapolei Drainage Master Plan, Draft Report, July 1998

This report was prepared in support of the East Kapolei development which was sponsored by the State of Hawaii, Housing and Finance Development Corporation. It forms the major basis for regional drainage requirements being implemented by this project.

1.4.3 Kapolei Gulch Technical Committee Interim Report

The Kapolei Gulch Technical Committee was formed to study and coordinate the drainage requirements and the water quality issues of the projects within the Kapolei Gulch Watershed. Members include representatives from State, City and private developers. This report identified interim and ultimate drainage guidelines to facilitate development within the watershed. Recommendations included using storage during the interim period to control runoff and ultimately to control water quality.
SECTION 2
EXISTING CONDITIONS

2.1 Watershed Description

2.1.1 Climate

The area receives only a moderate amount of rainfall from the prevailing northeasterly trade winds. The mean annual rainfall is about 33 inches per year. Most of the rainfall occurs from October through April, during southeastern "Kona" storms.

During the day and early evening hours, the site is relatively warm compared to other locations around Oahu and the state. Late night and early morning periods, however, are generally cooler than other locations. These conditions are a result of the site being on a downslope, or leeward, side of the island. Based on more than 50 years of data collected at the Ewa Plantation, average annual daily minimum and maximum temperatures in the project area are 65° F and 84° F, respectively. Extreme minimum and maximum temperatures were 47° F and 93° F.

2.1.2 Topography

The study area is located in the mid-to-lower portion of the Kalihi Gulch watershed, on the southern slopes of the Waianae Mountain Range. The uppermost portion of the watershed is over 2,500 feet above sea level. The lower end of the project site at Renton Road is at an elevation of approximately 44 feet MSL. The upper limit of the site above the interchange at H-1 is at an elevation of about 230 feet MSL. The lower portion of the site is relatively mid-slope with slopes varying between 0.7 and 2 percent. Slopes gradually increase to over 5 percent at the H-1 Freeway. Above the H-1 Freeway, slopes increase considerably in mountainous terrain reaching well over 20 percent in the upper watershed areas.

2.1.3 Soil Type and Ground Cover

The site contains four general soil types as classified by the Soil Conservation Service, now called the Natural Resources Conservation Service, NRCS. These include Honoaulili (HAA and HDB), Waikiki (WHA), Wilipahu (WHA and W2B), Mamala (Moc), Ewa (EVC and EDB), Kikea (Koya), Kawaihalapai (KBI and KBC), Mokula (MUB and MUC), Mahana (MB2 and MB1) and Stony Sheep Land (SV1), with Honoaulili being the predominant type. These are clay soils with moderately low permeability and high shrink-swell potential.

Ground cover conditions within the project site are primarily agricultural. The area was previously used for the cultivation of sugar cane. In the mountainous areas above the H-1 Freeway, ground cover consists of thin stand trees and fallow sugarcane fields.

2.2 Existing Drainage Conditions

2.2.1 Existing Hydrology

The existing Kalihi Watershed Map is shown in Figure 2-1. The proposed project is situated within the Kalihi Gulch watershed and can be described as affecting two main subwatersheds. Subwatershed A (subareas 1 to 24 and 51) contains the Kalihi and Honuapalike Gulch channels and discharges to the western portion of the Ewa Villages Golf course. Subwatershed B (subareas 25 to 517) encompasses the area just above Ewa Villages. Subwatershed B discharges into the central area of Ewa Villages and combines with the Kalihi Gulch channel upstream of the O.R. & L. Railroad Right-of-Way.

Runoff is carried through the project site primarily along the Kalihi and Honuapalike Gulch channels and overbank areas. Both of these drainageways are normally dry and are ephemeral in nature (flows occur only in response to precipitation that is significant to cause direct runoff). These drainageways flow from a confluence in the University of Hawaii West Oahu (UHWO) parcel to the northwest of Ewa Villages. A U.S. Geological Survey cross-stage gauge is located approximately 2,000 feet upstream of the H-1 Freeway (No.16212450 Drainage Area = 1.70 sq. mi.).

Runoff also flows through the project site as undefined sheet flows and poorly-defined shallow concentrated flows. These sheet and shallow concentrated flows occur mainly in the milder reaches below Farrington Highway.

Kalihi Gulch crosses the project at the H-1 Freeway and at two locations between Farrington Highway and Kapolei Parkway. The upper crossing occurs approximately 900 feet south of Farrington Highway. The lower crossing occurs approximately 500 feet north of the Ewa Villages.

North-South Road will discharge into Kalihi Gulch at several locations:

a. Kalihi Gulch Channel just above the H-1 Freeway (non-roadway runoff)
   Drainage Area = 2,800 acres (E. Kapolei DMP)
   Peak Discharge = 5,000 cfs (ultimate watershed flow per Plate 6)

b. Kalihi Gulch Channel at the entrance to Ewa Villages
   Drainage Area = 3,696 acres (Ewa Villages DMP)
   Peak Discharge = 7,000 cfs (ultimate watershed flow per Plate 6)

c. Sheet Flow into Ewa Villages over Retrofitted Mango Tree Road for eventual discharge into Kalihi Gulch through the Ewa Villages drainage system
   Drainage Area = 420 acres (Ewa Villages DMP)
   Peak Discharge = 1,450 cfs (ultimate watershed flow per Plate 6)
2.2.2 Existing Drainage Features

The existing drainage features in the vicinity of the project site include the Kaloa Gulch and Huenhune Gulch channels and culverts and bridges across existing roadways.

Features in Subwatershed A:

Along Kaloa Gulch (in order from upstream to downstream):

- 2-42 in CMP Culverts at a Plantation Road approximately 50 feet upstream of the H-1 Freeway
- 2-12 ft x 12 ft Box Culverts at H-1 Freeway
- 2 ft x 7 ft concrete Arch Culvert at a Plantation Road approximately 200 feet downstream of the H-1 Freeway
- 20 ft x 8 ft Single-span Bridge at Farrington Highway
- 15 ft x 10 ft Concrete Arch Culvert at a Plantation Road approximately 40 feet downstream of Farrington Highway
- 15 ft x 10 ft Box Culvert at Palahua Road
- 90 ft wide, Two-Span Bridge at Renton Road

Features in Subwatershed B:

Along Huenhune Gulch Tributary:

- 56-ft Culvert at H-1 Freeway
- 20 ft x 9 ft Single-span Bridge at Farrington Highway

Features in Subwatershed B:

- Interceptor Ditches along Relocated Mango Tree Road above Ewa Villages
- Culverts across Relocated Mango Tree Road

These features are further described below.

The Kaloa Gulch crosses a plantation road approximately 50 feet upstream of the H-1 Freeway through a pair of 42-inch CMP culverts. The culverts are approximately 60 feet in length and have minor-end conditions and headwalls.

The existing Kaloa Gulch crosses the H-1 Freeway approximately 1,300 feet east of the proposed North-South Road and will be affected by the two eastern ramps of the interchange. It consists of two 12-ft by 12-ft box culverts, approximately 132 feet in length. This cross-drain is owned and maintained by the SDOT and has an estimated capacity of approximately 2,000 cfs when flowing full. By comparison, the ultimate watershed flow in accordance with Plate 6 of the City and County of Honolulu Storm Drainage Standards is 5,900 cfs.

Kaloa Gulch passes through a 7 ft x 7 ft concrete arch culvert at a Plantation Road located approximately 200 feet downstream of the H-1 Freeway. This culvert is owned by the Estate of James Campbell.

At Farrington Highway, Kaloa Gulch crosses through a 20 ft wide x 12 ft high single-span bridge. This bridge is owned and maintained by the City and County of Honolulu, Department of Facilities Maintenance.

Approximately 40 feet downstream of Farrington Highway, Kaloa Gulch crosses through a 15 ft x 10 ft concrete arch culvert which is owned by the State Department of Land and Natural Resources (DLNR).

Approximately 900 feet downstream of Farrington Highway, Kaloa Gulch crosses Palahua Road through a 20 ft wide x 8 ft high bridge owned by the State DLNR.

Floors from the North-South Road project site will contribute Kaloa Gulch where is enters the northwest corner of the Ewa Villages Golf Course. Kaloa Gulch enters the golf course via a 20 ft x 8 ft concrete box culvert crossing beneath the Relocated Mango Tree Road. This culvert is owned and maintained by the City and County of Honolulu and has an estimated capacity of 900 cfs to closely match the 600 cfs Kaloa Channel capacity leading to the culvert.

Floors from the Kapolei Parkway project site will enter Kaloa Gulch just upstream of the Renton Road Bridge. This bridge is 96 feet wide and is able to handle the ultimate watershed flow (per Plate 6) of 8,300 cfs.

Huenhune Gulch crosses the project at the H-1 Freeway, approximately 1,600 feet east of the existing Palahua Road undercrossing. The existing Huenhune Gulch crossing at H-1 will be affected by the two western ramps of the interchange. It consists of a 60-inch diameter concrete culvert, approximately 200 feet in length. This cross-drain is owned and maintained by the SDOT.

Runoff from Subwatershed B sheet flow down to Ewa Villages and is collected in a series interceptor ditches. Culvert cross-drains carry collected runoff into the Ewa Villages Golf Course. The capacity of the interceptor ditches and culverts were designed for a 10-year recurrence and are limited because of their temporary purpose.
The existing bridge at the ORAL Railroad right-of-way is designed to ultimately pass the Plate 6 peak discharge. However, a barrier currently restricts the flow capacity to 2,500 cfs until developments downstream are able to accommodate additional flows.

The North-South Road will cross over Kalu Gulch twice between Farnham Highway and the proposed Kapolei Parkway. At these two other crossings, Kalu Gulch consists of a dirt and grass channel section with built-up banks. The built-up channel once served to contain Oahu Sugar Company (OSCo) irrigation water down to the lower fields. The Kalu Gulch Channel at these two locations are owned by the State Department of Land and Natural Resources.

The channel at the upper crossing location is approximately 35 ft wide between tops of banks, approximately 9 ft wide at the bottom and approximately 9 ft deep (channel bottom to top of lower bank). The channel bottom is sloped at approximately 0.8 percent and the bank-full channel flow capacity at this location is estimated at approximately 900 cfs.

At the lower crossing location, the channel is approximately 40 ft wide between tops of banks, approximately 10 ft wide at the bottom and approximately 9 ft deep (channel bottom to top of lower bank). The channel bottom is sloped at approximately 0.6 percent and the bank-full channel flow capacity at this location is estimated at approximately 900 cfs.

2.3 Flood Hazard Areas

2.3.1 Regulatory Flood Plan

A portion of the project is situated within the 100-year regulatory flood plain as determined by the Federal Emergency Management Agency (FEMA). The regulatory flood map is filed as a Letter of Map Revision, effective February 1, 2001 and is shown in Figure 2-2. The 100-year peak discharge used in the FEMA study is 2,059 cfs. A floodway is designated within the Ewa Villages Golf Course and terminates at Relocated Mango Tree Road. The project encroaches on a portion of the flood plain in the area at the northwest corner of Ewa Village.

2.3.2 Other Flood-prone Areas

The mild and uneven topography of the Ewa Plain creates many areas that have the potential for flooding. Runoff patterns are undefined and flow concentration paths change over time as the area usage changes. Some of the areas that are prone to flooding in the vicinity of the project include:

- Entire length of the Ko'ol and Honehune Gulch channels, including tributaries and overbank areas due to the limited capacities of the channels.
- Along Relocated Mango Tree Road where large flows from Subarea B are anticipated to overflow the roadway and flow into the Ewa Villages Golf Course.
- Varano Village near Renton Road where ponding occurred in 1996.
- Along the upvalley side of the H-1 Freeway where uncontrolled runoff can occur from the open watershed above.
SECTION 3
DRAINAGE PLAN CRITERIA AND CONSIDERATIONS

3.1 Goals and Objectives

The goals and objectives of the proposed drainage plan include:

- a. Handle roadway drainage for safe operation of the proposed roadways;
- b. Meet requirements for interim regional drainage;
- c. Consider needs for system expansion to meet ultimate regional drainage;
- d. Minimize impact to flooding of downstream and adjacent properties;
- e. Minimize impact to the Kaiapuni Stream where the roadway crosses the channel;
- f. Minimize impact to the Southern Oahu Basal Aquifer (SOBA);
- g. Minimize impact to water quality, and
- h. Minimize land, cost, operations and maintenance requirements.

3.2 Drainage Criteria Guidance

The drainage system preliminary engineering design and this report have been prepared in accordance with the following guidance documents:

- c. Storm Drainage Standards, City and County of Honolulu, Department of Planning and Permitting, January 2000.

3.3 Roadway Drainage Hydrologic Criteria

The hydrologic recurrence frequency used for design of the roadway drainage facilities are as follows:

- a. H-1 Freeway, Tm = 50 years (HDOT criteria)
- b. North-South Road, Tm = 25 years (HDOT criteria for areas outside regulated T/50A flood plain)
- c. North-South Road, Tm = 100 years (HDOT criteria for areas within regulated FEMA flood plain)
- d. Kapolei Parkway Roadway Drainage, Tm = 50 years (City criteria for areas with tailwater conditions)
- e. Bridges, Tm = 100 years.

3.4 Regional Drainage Criteria – Ultimate Conditions

The regional drainage system as defined by the East Kapolei Drainage Master Plan generally follows criteria used by the City and County of Honolulu. This project will be installing a portion of the regional drainage system in order to handle project-related runoff. The regional system consists of a drainage channel, storm water basins(s) and cross-drain culverts.

The drainage channel will sized for ultimate buildout conditions (100-year flow per Plate 6 of the City’s Storm Drainage Standards), but will be phased so that interim conditions, as described below in Section 3.5, can be met. The drainage basin will be sized to accommodate runoff increases only attributable to the North-South Road project. The basin may be increased in the future size by others for holding runoff from their developments.

The North-South Road project will also install cross-drain to accommodate flows from future developments. These are being installed at this time to their ultimate sizes and depths in order to avoid future impact to the roadway operations and to other utilities that are placed along the roadway. These cross-drains are sized in accordance with City Storm Drainage Standards, Tm = 50-year (Drainage Areas less than 100 acres) or 100 years (Drainage Areas greater than 100 acres).

3.5 Regional Drainage Criteria – Interim Conditions

The regional drainage system as defined in the East Kapolei Drainage Master Plan was to be implemented by the State of Hawaii, Housing and Community Development Corporation (HCDC). The North-South Road was originally programmed to be within the East Kapolei regional drainage system. However, HCDC has indefinitely deferred their plans for development of East Kapolei.

Therefore, in order to proceed with the development of North-South Road, an interim drainage plan was coordinated with between HDOT and the City and County of Honolulu. This plan was based on the guidelines of the Kaiapuni Technical Committee. Projects being implemented are required to provide detention and retention facilities to offset increases in storm runoff as well as control sediment transport for enhancement of water quality.

The Kaiapuni watershed does not have adequate capacity downstream to accommodate the 100-year storm peak discharge in accordance with the current City drainage standards. Until such time that downstream capacity is provided, the project will follow the guidance contained in the Kaiapuni Interim Drainage Plan Technical Memorandum and Addendum, dated May 24, 2002. This memorandum, which was accepted by the City and County of Honolulu on June 6, 2002, specifies the...
interim drainage criteria to be used by the project. The basic intent of the interim plan is to limit runoff from the upper watershed areas until downstream capacity is available.

The technical memorandum specifies that the regional drainage channel along North-South Road is to be designed with a capacity of 2,500 cfs. Flows that are in excess of this amount are anticipated to overflow the proposed channel and drainage basin and sheet flow into the Ewa Villages Golf Course by overtopping Relocated Mango Tree Road for eventual return to the Kahlo Gulch channel.

The memorandum also specifies that the existing culvert at the Kahlo Gulch Inlet to Ewa Villages Golf course be enlarged by the project to the interim drainage channel flow of 2,500 cfs.

3.6 Flood Plain Development Criteria and Considerations

The project will encroach onto the existing regulatory flood plain and will be subjected to requirements of the National Flood Insurance Program (NFIP) as well as 23 CFR Part 650A. The City and County of Honolulu administers the NFIP for this community and requires that flood plain compliance certifications be submitted for any work within a regulated flood plain.

A portion of the channel grading work will occur within the Ewa Villages Golf Course, where a floodway has been designated. Work within the floodway will require that a certification of "no-rise" to the regulatory flood elevations be submitted to the City and County of Honolulu for approval to ensure that such work does not cause any loss of flow conveyance.

The HPOT may also apply with the City and County of Honolulu for a change to the flood insurance rate map (FIRM) for Kahlo Gulch in order to reflect changes to the flood boundaries and elevations as a result of this project for the purpose of revising insurance rate zones in the area. In this case, the changes may be inconsequential since they will involve only minor flood boundary revisions and will affect only areas within the HPOT right-of-way.

3.7 Kahlo Gulch Crossings

The Kahlo Gulch channel is under the jurisdiction of the U. S. Army Corps of Engineers, pursuant to Section 404 of the Clean Water Act. The State is planning to apply for a Nationwide permit to cover the two North-South Road crossings over the Kahlo Gulch channel as well as the extension of inlet and outlet of the existing Kahlo Gulch 2-12 ft culvert at the H-1 Freeway. Channel realignment will not be allowed and any channel alteration will need to fall within the Nationwide Permit allowances for minor dredging and discharges.

3.8 Southern Oahu Basal Aquifer (SOBA) Requirements

The Environmental Protection Agency (EPA) has designated the SOBA as a sole-source aquifer. This designation requires that roadway projects receiving FHWA federal funding minimize discharge of pollutants over the aquifer recharge area. The limit of the SOBA recharge area is located approximately 1,000 to 1,500 feet makai of Farrington Highway. A criterion in the project is to capture all roadway runoff for areas over the SOBA and convey it via an impermeable conduit or channel to a point at least 1,500 feet downstream of Farrington Highway before it can be discharged to a permeable drainage channel.

3.9 Water Quality Considerations

The Ewa Development Plan and the Kahlo Gulch Technical Committee documents provide general guidance towards the need for enhancing storm water quality. There is a high potential for sediment generation and transport from the largely undeveloped upper watersheds due to the relatively dry and steep conditions. The project will need to consider methods to reduce soil erosion and sediment transport.

3.10 Site Constraints

There are a number of physical site constraints that the project's drainage system will need to consider:

a. Endangered plant colonies are located near the lower portion of the project site. A contingency reserve area has been designated around some of these plant colonies in order to preserve its natural habitat;

b. The 138 KV Hawaiian Electric Company power transmission line paralleling the roadway and drainage channel will need to have appropriate setbacks from deep channel and trench excavations in order to minimize any impact to pole foundations;

c. There are a number of utilities, including petroleum and gas lines and major water transmission mains, along the Farrington Highway corridor. The drainage culvert used to convey flows to the below the SOBA recharge limit will need to go under these utilities;

d. The North-South Road hydraulics is constrained to the boundary conditions at the connection to Ewa Villages; invert elevation of 52 feet MSL and a starting 100 year hydraulic grade of 63 feet MSL; and

e. The construction of the drainage features and incidental work activities, such as dust and erosion controls, hauling, access, and other activities will be restricted to within the proposed road right-of-way and designated construction parcels.
3.11 Other Technical Considerations

Other technical design issues being considered in this project include:

a. Safety with respect to open drainage basins and channels (fencing and access);
b. Bridge scour requirements;
c. Allowance for appropriate overflow in the event the design capacity is exceeded;
d. Maintenance of existing flow patterns as much as practicable;
e. Ease of operations and maintenance (use of ramps, access roadways, etc.);
f. Constructability;
g. Cost of construction and maintenance;
h. Land requirements;
i. Future adjacent land uses and needs;
j. Standing water nuisance and related health hazards;
k. Vandalism and trespassing;
l. Durability of materials;
m. Depths of future utilities and allowance for sufficient clearance of cross-drains;
n. Erosion potential and sediment entrainment; and
o. Flexibility for future expansion needs.

3.12 Computational Methods

Standard computational methods were used in preparing this report, as summarized below:

a. Hydrologic Computational Methods
   i. Rational method (for determining 10-, 25- and 50-year peak discharges for drainage areas less than 100 acres);
   ii. City and County of Honolulu Storm Drainage Standards, Plate 8 (for determining 100-year peak discharges for drainage areas of 100 acres or more);
   iii. Natural Resources Conservation Service Technical Release 20 (TR-20) and the U. S. Army Corps of Engineers, Hydrologic Engineering Center HEC-1 (for assessment of runoff hydrograph routing and determination of runoff peak discharge rate and volume changes);

b. Hydraulic Computational Methods
   i. Manning's equation (for determining sizes in open channel flow conditions with no lateral);
   ii. U. S. Army Corps of Engineers, Hydrologic Engineering Center HEC-RAS (for determining flow conveyance capacities and elevations affected by backwater conditions);
   iii. Weir equation (for determining basin spillway outlet capacity);

SECTION 4
PROPOSED DRAINAGE PLAN

4.1 Drainage Plan Concept

The intent of the drainage plan is to provide adequate handling of roadway storm runoff as well as to control drainage patterns for minimizing the potential for area flooding. The plan concept is to capture roadway runoff and convey it to the Kalihi Gulch regional drainage facilities.

Runoff from the North-South Road drainage system will enter the Kalihi Gulch channel at the top of Ewa Villages. The lowerriver portion of North-South Road will connect to the Kapolei Parkway drainage system or discharge into the Ewa Villages Golf Course. Runoff from the Kapolei Parkway drainage system will discharge into the Kalihi Gulch channel just upstream of the Rivenol Road bridge. Both the North-South and Kapolei Parkway roadways will be developed to urban standards and will utilize curbs and gutters for containing drainage.

The ultimate drainage plan for the area calls for "regional" facilities to be implemented to address off-site runoff and wildlife flooding from Kalihi Stream. These regional improvements are anticipated to be installed by area developments and will generally consist of drainage channels and storm water storage basins. Project areas above Farrington Highway as well as areas west of the proposed North-South Road are planned to feed the regional drainage system.

The proposed drainage plan for the project is considered an interim drainage plan for the East Kapolei area. The North-South Road and Kapolei Parkway are the initial developments in the area and will be implementing a portion of the regional drainage plan in order to provide adequate handling of roadway runoff and meet the interim requirements of the Technical Memorandum, Kalihi Gulch Interim Drainage Plan, May 24, 2002 as coordinated between HDOT and the City and County of Honolulu, Department of Planning and Permitting.

4.2 North-South Road Drainage Plan

The North-South Road drainage plan was analyzed under two watershed conditions: Interim and Ultimate. Interim watershed conditions assume that the developments in East Kapolei are not in place. Ultimate watershed conditions assume that the developments are in place.

The primary difference between the interim and ultimate drainage plans for North-South Road is in the amount of flows being carried by the proposed drainage channel and the regional cross-drains. The proposed drainage channel being installed under the North-South Road project will handle flows only for interim watershed conditions to meet the
Technical Memorandum requirements. The channel will be sized and installed for ultimate flows (per Plate 6) in order to minimize overall cost to the State. Implementation of the channel will be phased such that during the interim period, cross-drains will be used within the channel to meet the 2,500 cfs flow requirement. These conditions will be removed in the future as downstream flow capacity becomes available.

Cross-drains will be sized for ultimate build-out conditions, in accordance with the East Kapolei Drainage Master Plan in order to avoid reconstruction of the roadway pavement and disruption to traffic in the future. Under interim conditions, these cross-drains will be used to convey runoff from the undeveloped areas west of the roadway to the drainage channel along the east side of the roadway.

The ultimate and interim drainage plans for North-South Road are shown in Figures 4-1 and 4-2, respectively.

4.2.1 North-South Road Roadside Drainage Facilities
a. Roadside Drainage Facilities
The North-South road road drainage system will serve to capture runoff from traveled-ways, median and shoulder areas and will consist of a series of catch basins connected by pipe culverts. Culverts will range in sizes from 24- to 84-inches. The catch basins spacing ranges from 200 to 250 feet and are designed to limit flow spread to a maximum of 1/3 of the width of the travel lane. Pipe culverts are sized to maintain hydraulic grades with a minimum freeboard of 1 foot between the design water levels and the gutter low point at the catch basins.

b. Interchange and Roadway Portions over the SOBA Recharge Area
Runoff from off-site watershed areas (non-roadway runoff) above the interchange will be intercepted by ditches and sent to either Kalo Gulch or Hanahuna Gulch for disposal and will not be mixed with roadway runoff. Cutoff ditches are positioned along the tops of all cut slopes along the maika‘u perimeter of the interchange ramps.

Roadway runoff from portions upslope of the SOBA recharge line will be captured and piped down to a point downstream of the recharge line (approximately 1,200 feet south of Farrington Highway). Reinforced concrete culverts used to carry runoff off of the SOBA recharge area vary in size from 48-inches to 84-inches.

Runoff from non-roadway areas within the interchange area will be allowed to drain to Kalo Gulch or percolate in sumps located in the open spaces between ramps. Overflow from these sumps will be captured and directed towards the west for disposal into Kalo Gulch via an open grass swale and culvert system.

c. Roadway Portions below the SOBA Recharge Area
Roadway runoff from the portions below the SOBA recharge line will be collected and piped to the regional drainage channel through a series of outlets spaced approximately 1,000 apart. Runoff from the lower portion of North-South Road (situated below the Kalo Gulch inlet to Ewa Villages and including the intersection with Kapolei Parkway) will be piped into the Ewa Villages Golf course for disposal into the Kalo Gulch system.

c. Interim Interceptor Ditches
During the interim period, when areas adjacent to the roadway are undeveloped, sheetflow from these undeveloped off-site areas along the roadway segment will be intercepted by a series of temporary ditches and piped across the roadway through the regional cross-drains for discharge into the drainage channel. Temporary inlet structures with rock filters will be used to capture and handle runoff from these areas. These temporary ditches are necessary to control and dispose of runoff that would otherwise be diverted to other areas by the roadway embankment. All ditches and inlets will be located within the proposed road right-of-way.

4.2.3 North-South Road Regional Drainage Facilities
a. Regional Drainage Channel
The drainage plan for North-South Road calls for the implementation of a portion of the regional drainage channel and storage basin to handle project runoff. The purpose of the channel is to receive roadway runoff. It will also serve to capture overflows from the Kalo Gulch channel at the upper crossing of North-South Road (approximately 900 feet south of Farrington Highway).

The channel will be located along the east side of the roadway and will be designed to convey ultimate watershed flows in accordance with Plate 6 of the City drainage standards. During the interim period, however, flow conditions will be held to meet the 2,500 cfs flow requirement in accordance with the Technical Memorandum for the Intermediate Kalo Gulch Drainage Plan. The flow conditions may consist of reduced width channel sections, berms and spillways, and/or roadway crossings with culverts. These conditions will be removed in the future as downstream flow capacity becomes available.

The channel has three distinct reaches, as described below:

i. Lower Reach (between the drainage basin and the Campbell Estate parcel, approximately 3,500 feet south of Farrington Highway). This section will utilize a trapezoidal section consisting of a 60-foot wide bottom and 2.1 side
Slopes for a total top of bank width of 160 feet. The channel will be lined with grass to filter sediments and slopes are kept to a mild 0.08 percent to minimize erosion. Hyrdraulic drop structures, varying in height from 2 to 3 feet and consisting of CRM lining, will be used to maintain mild channel grades. At the interim design flow of 2,500 cfs, flow velocities range from 4 to 6 fps and channel shear stresses range from 0.5 to 0.8 psi.

i. Middle Reach (along the Campbell Estate parcel, between approximately 3,600 to 1,900 feet south of Farrington Highway). Due to land acquisition constraints along this Campbell Estate parcel, a narrowed section is used, consisting of a trapoidal section with a 20-foot-wide bottom and 11-foot side slopes for a total top of bank width of 70 feet. Slopes are maintained at a slightly steeper 0.9 percent in order to improve hydraulic capacity. The channel will be lined with grouted rip-rap, CRM or concrete due to the higher velocities anticipated in this narrowed section. At the interim design flow of 2,500 cfs, flow velocities range from 12 to 14 fps and channel shear stresses range from 1.0 to 1.8 psi.

ii. Upper Reach (from approximately 1,900 feet to 1,000 feet south of Farrington Highway). This section will be similar to the lower reach in dimension and channel slope and will also utilize 3-foot deep CRM drop structures for gradient control.

The channel depth (invert to top of bank) varies from 18 to 22 feet. Maximum flow depths based on the interim design flow 2,500 cfs range from 4 to 6 feet.

The 100-year (Plate 6) discharges, in accordance with the East Kapolei Drainage Master Plan, were analyzed in the channel to assess hydraulic grades and velocities under ultimate build-out conditions. Flow depths were found to range between 6 and 15 feet and resulted in a minimum flow depth of 3 feet. Flow velocities ranged from 4 to 8 fps in the grass-lined sections and 16 to 18 fps in the CRM lined section.

b. Drainage Retention / Detention Basin

A drainage retention/detention basin is proposed to handle runoff increases from the North South Road project and help reduce sediment transport from the watershed. The basin is not sized to accommodate runoff increases from other developments within the watershed. It may be enlarged by others in the future to accommodate runoff increases from their developments.

The basin is proposed to be located at the downstream end of the regional drainage channel. The project is estimated to create an increase of approximately 76 acre-feet in runoff at Kalihi Gulch channel into Ewa Villages. This increase is due to the added impervious surfaces, based on a contributing roadway drainage area of 130 acres as well as a slightly larger drainage area being directed to the Kalihi Gulch channel at Ewa Villages.

Sediment loading is estimated at 16 acre-feet per year, based on an estimated 12 tons per acre per year from the approximately 3,000-acre watershed.

The retention storage volume provided in the basin was selected at 110 acre-feet to account for 76 acre-feet of runoff retention plus sediment storage of volume of 32 acre-feet (approximately 2 years of storage capacity).

The detention volume (storage above the retention volume) is estimated at 30 acre-feet and includes storage within the basin as well as in the lower portions of the drainage channel. The basin depth may be deepened to increase sediment storage to reduce re-suspension and long-term maintenance. It is anticipated that adjacent developments will enlarge the basin to meet their development runoff and sediment storage needs.

c. Infrastructure at Ewa Villages Golf Course

The regional drainage system will discharge into Kalihi Gulch at the Ewa Villages Golf Course. The existing 2014 4-ft box culvert at the Kalihi Gulch channel into Ewa Villages will be enlarged to accommodate a flow of 2,500 cfs in accordance with the Interim Drainage Plan for North South Road. The interface between the drainage basin and the golf course will consist of a siltfall from which basin overflows will enter the box culvert structures. Flows exceeding the 2,500 cfs capacity will overflow the basin, overtop the relocated Mango Tree Road and enter into the golf course to the east of the Kalihi channel.

Some minor improvements will be required within the Ewa Villages Golf Course to accommodate the added culvert structure. These improvements will consist of modification of the existing debris structure and minor grading to transition existing grades to the wider culvert structure.

d. Drainage Channel Bridge Crossings

Two future collector roadway connections are anticipated to occur along North South Road. In order to maintain access to adjacent lands over the regional drainage channel, bridges at these future roadways are proposed to be implemented by the project. Each of these roadways is assumed to have a right of way width of 150 feet. Bridge or culvert structures are proposed to be implemented over the drainage channel at these future roadway locations to maintain access across the channel. These structures will be sized to pass the design flow of 2,500 cfs to meet the interim watershed requirements. These structures are anticipated to be enlarged by others when needed to carry the ultimate watershed flows.
f. Kaliu Gulch Bridge Crossings
The North-South Road crosses Kaliu Gulch at two locations between Fairington Highway and Kapolei Parkway. The upper crossing occurs approximately 500 feet south of Fairington Highway. The lower crossing occurs approximately 500 feet north of the Ewa Villages. At each crossing, 40-foot single-span bridges will be used to carry the roadway over the Kaliu Gulch channel. Alteration of the channel will involve trimming the tops of the channel banks to accommodate the bridge structure and foundations. Work is not planned to occur below the ordinary high water mark at each of the crossings.

f. Kaliu Gulch Culvert Modification at H-1
The existing double 12-ft x 12-ft box culverts at the Kaliu Gulch crossing of the H-1 Freeway will need to be lengthened at the inlet and outlet to accommodate freeway widening involved with the two eastern ramps (westbound off-ramp and eastbound on-ramp). The capacity of these culverts is inadequate to handle the 100-year flow; however, upgrading the size of this culvert is not being proposed due to the operational disruption to the freeway and due to permit requirements for performing major alteration of the Kaliu Gulch channel.

g. Cross-Drains for Future Developments
Major cross-drains will be installed across North-South Road to accommodate runoff into the regional drainage channel from future developments situated to the west of the roadway. The sizes and locations of these culverts are generally as specified in the Ewa-Kapolei Drainage Master Plan. Cross-drains were designed to be relatively deep in order to provide sufficient clearance for future utilities that are planned within the utility corridor area next to the roadway.

4.3 Kapolei Parkway Drainage Plan
The drainage plan for Kapolei Parkway (portion between Renton Road and North-South Road) calls for runoff to be piped down to the vicinity of Renton Road where an approximately 84-inch culvert (or equivalent box culvert structure) will discharge approximately 100 cfs runoff into the Kaliu Gulch channel at the bottom of the Ewa Villages Golf Course, just upstream of the existing Renton-Road bridge. Kapolei Parkway does not encroach onto any regulated flood plain.

The drainage plan for Kapolei Parkway is shown in Figure 4-3.

4.3.1 Kapolei Parkway Roadside Drainage Facilities
The Kapolei Parkway roadside drainage system will serve to capture runoff from traveled ways, median and shoulder areas and will consist of a series of catch basins connected by pipe culverts. A drain connection is also provided pick-up future flows from a 5-acre portion of an adjacent residential development parcel.

Culverts will range in sizes from 18- to 64-inches. The catch basins spacing ranges from 150 to 250 feet and are designed to limit flow spread to a maximum of 1/3 of the width of the travel lane. Pipe culverts are sized to maintain hydraulic grades with a minimum freeboard of 1 foot between the design water levels and the gutter low point at the catch basins.

4.3.2 Kapolei Parkway Regional Drainage Facilities
The regional drainage facilities for mitigating runoff increases for Kapolei Parkway have already been built into the Ewa Villages Golf Course in accordance with the Ewa Villages Drainage Master Plan. Runoff increases of 5 acre-feet are estimated from the roadway portion between Renton Road and North-South Road. The Ewa Villages Golf Course contains approximately 60 acre-feet of retention storage and some 350 acre-feet of combined detention storage.

4.4 Plan Evaluation
4.4.1 Assessment of Hydrologic Impacts
a. North-South Road
The storage basin retention volume of 50 acre-feet is more than adequate to contain the 20-acre-feet of runoff increase from the roadway. In addition, the Initial Drainage Plan for North-South Road requires concentrated peak discharges to be limited to 2,500 cfs at the Kaliu Gulch channel inlet to Ewa Villages. The use of the retention/detention basin will serve to disperse flows that exceed this capacity by allowing runoff to overflow into the Ewa Villages Golf Course along the Relocated Mango Tree Road boundary.

Runoff will not be increased downstream and adverse hydrologic impacts from the project are not anticipated.

b. Kapolei Parkway
Mitigation for Kapolei Parkway runoff was already considered in the Ewa Villages Drainage Master Plan and implemented in the Ewa Villages Golf Course. Additionally, the roadway embankment already exists and local drainage pattern will not change significantly by the project. No adverse hydrologic impacts are anticipated.

4.4.2 Assessment of Flood Plain Impacts
a. Proposed Flood Plain Description
A portion of the regulatory flood plain along Kailol Gulch will be impacted by the North-South Road project. The area of impact is located near the northwest corner of the golf course, where Kailol Gulch enters.

b. Assessment of Impacts

The project will increase the culvert capacity at the Kailol Gulch inlet to Ewa Villages to 2,500 cfs. This flow is greater than the 2,359 cfs flow used by FEMA in its flood plain analysis of Kailol Gulch and therefore, flooding will be contained within the Kailol Gulch channel and 2,500 cfs regional drainage channel and basin areas.

The capacity enhancements within the Ewa Villages Golf course will enlarge the drainageway in the golf course slightly and improve hydraulic capacity. Therefore, adverse effect to the flood plain floodway conveyance is not anticipated.

The affected area of the flood plain lies within the Ewa Villages Golf Course, where a flood plain is already delineated, or within the proposed North-South Road right-of-way, where the roadway, drainage channel and basin are proposed. The flood plain changes will not affect either adjacent lands.

4.4.3 Assessment of Other Items

a. Flooding and Drainage

The project is designed to handle roadway as well as address regional drainage concerns. The project will reduce flooding above Ewa Villages by using increased culvert and channel flow capacities.

b. Future Expansion

In terms of future expansion, the regional drainage channel is sized to accommodate the interim watershed flow of 2,500 cfs. The west side of the channel and drainage basin along the roadway will be set at their permanent grades. Widening of the channel and drainage basin to accommodate ultimate watershed flows is anticipated to occur along the east side.

c. SOBA Impacts

The impact to the SOBA has been mitigated by piping roadway runoff to discharge below the SOBA recharge area.

d. Regional Drainage Criteria

The project is being implemented based on the concepts in the East Kapolei Drainage Master Plan. This approach will enhance the ability of future developments to expand...
SECTION 5
CONCLUSION

The drainage plans for North-South Road and Kapolei Parkway were evaluated based on a number of factors including hydrology, flooding, flood plain encroachment, ground and surface water quality, compatibility with future developments, land requirements, site constraints, construction cost, and operations and maintenance requirements. The assessments were made based on a review of existing conditions and were compared with anticipated watershed conditions caused by the proposed project.

Based on the report findings, it has been determined that the project will provide for sufficient handling of runoff increases as well as other improved levels of flood and storm water quality control within this portion of the watershed. The added flood control capacity of 2,500 cfs provided by the regional drainage channel and drainage basin will enable the containment of the FEMA regulatory flood. The 110-acre retention basin will provide sufficient mitigation to offset runoff increases from the project.

In order to minimize cost to the State, the drainage channel is being sized for the ultimate (Plate 6) flows and will be implemented in phases in order to meet the interim (2,500 cfs) flow requirement.

Erosion and sediment transport controls such as, the use of a sediment retention storage basin, the use of boulders to minimize entrainment of sediments and the use of vegetative livings in the basin and channel area are being designed into the drainage plan.

Additionally, the roadway drainage plans will be designed based on the framework of the East Kapolei Drainage Master Plan in order to be in conformance with adjacent area developments.

It is concluded that the proposed drainage systems will adequately support the roadways and that significant adverse impacts to downstream and adjacent properties are not anticipated.

LIST OF REFERENCES


9. "Technical Memorandum, Ko'olulau Interim Drainage Plan, North-South Road," prepared by the State of Hawaii, Department of Transportation and City and County of Honolulu, Department of Planning and Permitting, May 24, 2002.
APPENDIX A

Technical Memorandum
Kaloi Gulch Interim Drainage Plan
Mr. Brian K. Mizaki, Director of Transportation
State of Hawaii
Department of Transportation
401 Punchbowl Street
Honolulu, Hawaii 96813-2097

Dear Mr. Mizaki:

Technical Memorandum, Kualii Gulch interim Drainage Plan, North South Road Phase 1, Kapolei Parkway to Farrington Highway (0201-50-3 1399)

This is in response to your letter of April 10, 2002, regarding a proposed technical memorandum for hydrology for the Kualii Gulch Interim Drainage Plan.

We have reviewed the technical memorandum and its addendum, which was submitted by R.M. Towill Corporation on May 24, 2002.

As submitted, the interim drainage plan for Phase 1 of the North South Road Project is acceptable.

Should you have any questions, please call Scott Nakamura of our Site Development Division at 527-6747.

Sincerely yours,

RANDALL K. KUHI, AIA
Director of Planning and Permitting

RKF/ty
[15/1399]
cc: R.M. Towill Corporation

ADDITION TO TECHNICAL MEMORANDUM
KALOII GULCH INTERIM DRAINAGE PLAN - NORTH-SOUTH ROAD PHASE 1, KAPOLEI PARKWAY TO FARRINGTON HIGHWAY
HYDROLOGY FOR THE INTERIM DRAINAGE PLAN

DATE SUBMITTED: May 24, 2002
PROJECT: NORTH-SOUTH ROAD
PREPARED BY: R.M. Towill Corporation
PREPARED FOR: Department of Transportation, State of Hawaii

Purpose
This Memorandum describes the proposed interim drainage plan hydrology of Kualii Gulch that will be used in the North-South Project.

Background
The original North South Road drainage system was integrated into the Housing and Community Development Corporation of Hawaii (HCDOH) East Kapolei Project's Drainage System for Kualii Gulch. Due to the change in the housing market, the HCDOH has deferred the development of their East Kapolei Project. The date when the proposed East Kapolei development will proceed is indeterminate at this time.

The Department of Transportation (DOT) of the State of Hawaii intends to continue with the planning and design of the North South Road Project and constructs the road prior to the re-start of the East Kapolei Project. An interim drainage plan for Kualii Gulch is required to design and construct the North South Road until the drainage improvements for the proposed East Kapolei Project are completed.

Interim Drainage Plan
The North South Road will cross Kualii Gulch approximately 2,500 feet south of Farrington Highway. The road grade will be higher than the existing grade of the gulch. Most of the Kualii Gulch storm runoff will flow to the east of the North South Road and the rest will flow within the storm channel to the west. A culvert will be constructed to allow the North South Road to cross the Gulch to maintain the Kualii Gulch stream and allow runoff to flow from east to west. The culverts will be sized to convey the flow determined by the interim drainage plan hydrology. The remainder of the runoff on the east side of the North South Road will be conveyed within a channel sized for 2,500 cubic feet per second (cfs) according to the Existing Agreement of the Kualii Gulch Flood Task Force or channel flow to the boundary of the Eva Villages Golf Course. A second culvert is required where Kualii Gulch once again crosses the North South Road at the southwest corner of the Eva Villages which is the Kualii Gulch catchment to the Golf Course.
culvert will be sized to convey the remainder of the flow for the drainage basin. Subarea box will be restricted during the interim until the regional drainage system for Kahal Gulch is resolved. A detention basin sized for the increase in runoff generated by the North-South Road project will be constructed at the Kahal Gulch entrance to the Ewa Villages Golf Course. A new box drain will be constructed to discharge the storm runoff into the Ewa Villages Golf Course.

Interim Drainage Plan Hydrology

The proposed interim drainage plan hydrology to be used for the North-South Road drainage analysis is based on the existing drainage patterns defined in the Ewa Villages Drainage Master Plan. The existing drainage patterns are shown on Figure 3-2 (attached) of the Ewa Villages Drainage Master Plan. Figure 3-2 shows that Subareas 1-4, 13, 14, 22, 24 and 51 - 517 drain into the Ewa Villages Golf Course from within or from the east side of Kahal Gulch. The runoff is sheet flowing to the Golf Course except for the flow within the stream channel.

The proposed North-South Road culvert at the Kahal Gulch entrance will convey the flow calculated in the Ewa Villages Drainage Master Plan for the stream channel. The calculated channel flow is 800 cfs. This flow will be allowed to pass under the North-South Road at the second culvert near the Golf Course. The remainder of the flow calculated for Subareas 1-4, 13, 14 and 22 - 517 will remain in the east side of the North-South Road and flow within the 2,500 cfs channel to the proposed basin or sheet flow to the Ewa Villages Golf Course. Subareas 15, 22, 24 and 51 will be restrained from flowing to the Golf Course by restricting the flow of the second culvert to the calculated channel capacity of 800 cfs. The ultimate capacity of the culvert will be sized to drain subareas 3-12, 15-21, 23, 25 and 26.

An excerpt from the Ewa Villages Drainage Master Plan has been attached for background information as well as a drainage area map (FIGURE 3-2A), Plan 6 peak discharge design curve (FIGURE 3-3) with proposed flows and the Caneyard North-South Road Interim Drainage Plan (FIGURE 3-4). Kahal Gulch is an intermittent stream with limited capacity. In many areas the stream banks are higher than the low adjacent to the stream. The mokua North-South Road culvert near Farrington Highway will be designed to convey 600 cfs under entrance control conditions. The headwaters at 800 cfs will match the water surface of the 2,500 cfs channel and the weir flow over the banks of the 2,500 cfs channel for the remaining overland sheet flow. The mokua North-South Road culvert will be designed to convey 2,000 cfs but the Kahal Gulch stream channel testing on the culvert can only convey 800 cfs. Additional basins will be added during the preparation of the drainage master plan if they are needed to ensure that only 800 cfs is conveyed to the mokua culvert.

The North-South Road culvert will discharge into the Ewa Villages Golf Course where the existing Kahal Gulch 20' x 8' box culvert presently discharges into the golf course. The box culvert capacity is limited to 900 cfs by entrance control. Additional box culverts will be designed to convey the additional 1,593 cfs allowed under the Interim Kahal Gulch Agreement and the full 5,883 cfs for the ultimate development as described in the Ewa Villages Drainage Master Plan, Table 5-1. The culverts for the ultimate development will be plugged until additional flows are allowed by the Ewa Marina.
Excerpt from Ewa Villages Drainage Master Plan

SECTION I
INTRODUCTION

1.1 Background
The Ewa Villages Revitalization development is sponsored by the Department of Housing and Community Development (DHCD) of the State of Hawaii for the purpose of providing affordable housing for the community. The project site is located in the old Ewa Villages area and covers roughly 606 acres (see Figures 1-1 and 1-2). The project will consist of approximately 1,028 single-family (SF) and 400 multi-family (MF) residential units, schools, parks, commercial and civic facilities and an 18-hole golf course. The homes and infrastructure that presently exist will be upgraded where feasible. Further development information may be found in the Final Environmental Impact Statement for the Ewa Villages Master Plan (Reference 8).

The Ewa Villages site has poor drainage due to inadequate drainage systems. The flat topography combined with light clayey soils promotes ponding in many areas. In addition, a large portion of the site is located within the Koolau Stream flood plain. Irrigation ditches and swales used for draining the surrounding sugarcane fields comprise most of the drainage system. In general, there are no street stormwater systems, except in the more recently improved areas, such as Fernandez Village.

1.2 Purpose and Scope
This report describes the drainage plan for the Ewa Villages Revitalization project. The purpose of the drainage plan is to improve local drainage and remove inoperable areas from stream flooding.

The scope of this master plan includes:
- Assessment of drainage during existing conditions.
- Assessment of drainage during interim developed conditions (project site developed, upper watershed undeveloped).
- Assessment of drainage during ultimate developed conditions (project site developed, upper watershed undeveloped).

1.3 Related Studies
1.3.1 EIS for the Ewa Villages Master Plan
A preliminary drainage assessment was made in the report entitled "Final Impact Statement for the Ewa Villages Master Plan" dated February 1991 prepared by R. M. Yozell Corporation (FYMC) for the DHCD (Reference 8). Flood protection measures cited in the report included using the proposed golf course to safely convey floodwaters through the area and using the proposed relocated Mango Tree/Waimanalo Road (canal) as a sewer to control runoff entering the site from above.

1.3.2 FEMA Flood Insurance Study
A portion of Koko Gulch has been studied by the FEMA and is included in the effective FIS for the CHH. The September 1990 FIS has been recently revised by a Letter of Map Revision (LORV) dated March 21, 1995 (Reference 16). The study area stretches from 400 feet below the ORNL Railroad Right-of-Way up to the relocated Mango Tree Road (canal road). The 100-year peak discharges were listed at 2.49 cfs at the lower end, drainage area (DA) = 5.8 square miles and 2.359 cfs at the upper limit, DA = 5.2 square miles. The revised Flood Insurance Rate Map (FIRM) (Reference 16) shows the Ewa Villages Golf Course and portions below bleston Road to be in the 100-year flood zone.

1.3.3 Drainage Master Plan for the Gentry-Ewa Project
The immediate neighbor downstream of Ewa Villages is the Gentry-Ewa development. The "Drainage Master Plan for the Gentry-Ewa Project" prepared by Bob Collins and Associates (BCA) describes facilities that will accept the Ewa Villages runoff (Reference 5). Runoff is shown to enter the Gentry site in two locations: 1) At Koko Stream, where Gentry proposes a golf course to handle the runoff from a realigned stream course; and 2) Along Fort Weaver Road, where an existing drain line along Fort Weaver Road is sized...
to convey the runoff into another portion of the Gentry golf course.

The BCA report proposes an interim drainage plan due to limited capacity below the Gentry site. The interim plan is based on allowing only 800 cfs through the Kailo Stream channel from the Ewa Villages site until the Ewa marina project provides adequate capacity below Gentry. The computations in this study indicate that more than 600 cfs may enter the Gentry site under existing and developed conditions. The Kailo Gulch Technical Committee was formed to address this and other issues related to the drainage coordination between projects along the Kailo Stream watershed.

The design hydraulic grade line (HGL) and tie-in invert elevations listed at the upper Gentry boundary are 30.6 feet and 30.0 feet, respectively. The Phase 5 peak discharge is 8,000 cfs. The 8,400 cfs listed in the Gentry Report used a peak flow rate graph that was superseded by the 1988 revised drainage standards.

1.3.4 Kailo Gulch Technical Committee Interim Report

The Kailo Gulch Technical Committee was formed to study and coordinate the drainage requirements and the water quality issues of the projects in the Kailo Gulch watershed. The members of the committee include engineers for the private developments, representatives for the State and City projects, and representatives from the Drainage Section of the City and County of Honolulu, Department of Public Works.

Projects along the Kailo Watershed are at various stages of planning, design and construction. The Kailo Gulch Technical Committee Interim Report (Reference 5) identifies interim and ultimate drainage guidelines to facilitate ongoing improvements and mitigate the impact of greater conveyance of runoff through the watershed.

Part of the interim plan calls for the incorporation of detention storage features in all projects. It specifies that Ewa Villages should provide approximately 60 acre-feet of "retention" (small outflow allowed) and 300 acre-feet of detention to meet its share of the storage requirements.
SECTION 2
CRITERIA AND METHODOLOGY

The criteria used in this study are summarized below. The City and County of Honolulu Storm Drainage Standards provide the general requirements:

- **Roadway Bridges and Box Culverts**
  - Capacity = peak discharge from Plate 5 (Reference 1)
  - Sizing Method
    - Culverts: Interceptor control charts (Reference 15)
    - Bridges: HEC-2 backwater analysis (Reference 12)
    - Freeboard: 5 feet between HGL and top of roadway

- **Street Drainage System**
  - Capacity = DA > 100 acres
    - Peak discharge from Plate 6
    - DA = 100 acres
      - 10-year peak discharge or 50-year peak (in srcump or tidal situations) using rational method (Reference 1)
  - Sizing Method = Manning's
  - Minimum Freeboard = 1 foot between HGL and inlet opening

- **Golf Course Drainageways**
  - Capacity = Plate 5 discharge
  - Sizing Method = HEC-2 backwater analysis
Golf Course Basins and Spillways

- Spillway Capacity = Plate 6 discharge
- Spillway Sizing Method
  - weir length approximated using
    \[ Q = CLH^m \]  
    (Reference 7)
  - C = coefficient
  - L = length
  - H = head over weir
- Interim outflow rates (based on Kualo Gulch Technical Committee Guidelines)
  - Limited to small amounts until 60 ac ft of runoff is stored.
  - Limited to the 2-year, 6-hour peak discharge until 300 ac ft of runoff is stored.
- Flood Routing Method - HEC-1 Storage Indication Method (Reference 11)

Hydrographs for Existing and Developed Conditions Peak Flows

- Rainfall Depths = DLNR R-73 (Reference 10)
- Runoff Curve Numbers = SCS (Reference 14)
- Time of Concentration = SCS (Reference 14)
- Hydrograph Computation = HEC-1

SECTION 3
PRE-DEVELOPED DRAINAGE CONDITIONS

3.1 Study Area Location
The study area is located in Ewa, Oahu, Hawaii, covering portions of Tax Map Keys: 9-1-16:25 and 9-1-17. It is approximately two miles south of Waipahu and 1 mile northeast of the Village of Kapolei and is on a region of Oahu commonly referred to as the Ewa Plain. The 300-acre site is owned by the City and County of Honolulu. Land uses include residential, schools, parks, and commercial.

3.2 Climatology
The area receives only a moderate amount of rainfall from the prevailing northwesterly trade winds. The mean annual rainfall is about 23 inches per year. Most of the rainfall occurs from October through April, during southerly "Kona" storms. In recent years, the "El Nino" pacific meteorological effect has contributed to milder atmospheric conditions.

During the day and early evening hours, the site is relatively warm compared to other locations around Oahu and the state. Late night and early morning periods, however, are generally cooler than other locations. These conditions are a result of the site being in a downwind area of the island. Based on more than 50 years of data collected at the Ewa Plantation, average annual daily minimum and maximum temperatures in the project area are 60° and 84°F, respectively. Extreme minimum and maximum temperatures were 47°F and 92°F. (Reference 8)

3.3 Topography
The study area is located near the mid-to-lower portion of the Kualo Stream watershed, on the southern slopes of the Waianae Mountain Range. The uppermost portion of the watershed is over 2,000 feet above sea level. At the project site, the average elevation at the lower boundary (CRML Railroad Right-of-Way) is 35 feet and rises to about 65 feet at the upper boundary (referred to mean sea level). The site is relatively flat with
The project site is located in two watersheds: Kaolik Stream watershed and West Loch watershed. The West Loch watershed, consisting of subareas S18 to S21 and 27, enters the northeastern portion of Ewa Villages and exits through openings at Fort Weaver Road. The openings currently consist of a 50-inch road underpass and two 54-inch RCP culverts. The culverts have a capacity of approximately 500 cfs.

The Kaolik Stream watershed is approximately 90% of the primary drainage way in the future. It is a small stream with a full bank capacity of less than 1,000 cfs. Numerous road crossings further restricts flow to less than 500 cfs in some locations. Overflows are generally not able to return to the channel. Kaolik Stream was used by Oahu Sugar Company (OSCo) to carry irrigation water down to the lower fields and therefore has built-up banks which are higher than the adjacent ground.

Kaolik Stream is gauged above the H-1 Freeway by the U.S. Geological Survey (Gauge No. 18212450 Drainage Area = 1.70 sq. mi.).

There are several existing sumps between Farrington Highway and the project site that provide storage of storm runoff. The topography within the Ewa Villages area is relatively flat and ponding has been reported in many areas due to inadequate drainage. The ORNL Railroad Right-of-Way is slightly higher than the ground immediately upstream of it and therefore compounds the potential for flooding. A 50-inch culvert is used to pass irrigation flows in Kaolik Stream under the railroad tracks. The capacity of this culvert is estimated at least 200 cfs.

The 2year, 10-year, and 100-year discharge estimates into and out from Ewa Villages have been computed for existing conditions. The HEC-1 computations incorporate low diversions caused by restrictions (e.g., culverts at roadway) as well as flow routing in the natural depressions. The discharges are summarized in Table 3-1.
SECTION 4
PROPOSED DRAINAGE PLAN

4.1 Drainage Plan Concept

The intent of the drainage plan is to control riverine flooding and provide adequate drainage for on-site and off-site generated runoff.

To carry out the plan, "regional" facilities are proposed to address off-site runoff and mitigate flooding from Kolii Stream. "Backbone" facilities are proposed to address on-site generated runoff and leads into the regional facilities. The street drainage systems within each of the development parcels which feed the backbone system are referred to as the subdivision systems. Due to the preliminary status of street layouts within these subdivisions, sizing and alignment of these smaller systems are left as design items.

4.2 Regional Drainage System

Flood control along Kolii Stream and conveyance of major runoff are handled by the regional drainage system. The primary facilities of the regional system include the golf course, Kolii Stream channel improvements, and roadway bridges and box culverts. Figure 4-1 shows the regional drainage system.

The regional facilities were sized using the criteria in Section 2. HEC-1 analyses were conducted to determine the 2-year, 10-year and 100-year peak flow rates under interim and ultimate conditions. Interim conditions refer to the watershed with the areas above Ewa Villages as undeveloped (remain as sugarcane/agriculture). Ultimate conditions assume that the areas above Ewa Villages are reasonably built-out.

The golf course is the main regional facility. It stretches the entire length of the project site and intercepts all incoming mauka flows. The golf course will be excavated in order to convey the City standard Para 8 peak discharge. Detention basins will be incorporated to help attenuate peak flows and address water quality.

Kolii Stream will be realigned slightly as part of the golf course and downstream channel improvements. The connection point to the Gentry development is about 350 feet southwest of the present Kolii channel crossing at the ORML Railroad Right-of-Way. The avet 10-in. to the Gentry development is 26 feet mid.

A 105-foot wide bridge is proposed at the Kolii Stream/ORML Railroad crossing. Ninety-foot wide bridges are also proposed at North South Road and at Renton Road. Each of these bridges are designed to pass the Para 8 discharge. Interim use basins will be constructed between each of these bridges. Ultimately, an open channel will replace the basins. The channel will consist of rectangular and trapezoidal sections, varying in width between 90 and 110 feet. The channel will be lined with concrete and riprap and is proposed to be incised by the City.

Overflow from Kolii Stream above Ewa Villages is expected to flow on the east overbank and enter Ewa Villages from subwatershed 51.

A 20' x 18' box culvert is planned at the top of Kolii Stream Branch 'A' at the northeast corner of the golf course. This culvert is sized to the capacity of the Kolii Stream channel (approximately 1,000 cfs). It is anticipated that this culvert will be expanded in the future to carry the Para 8 discharge.

A 20' x 18' box culvert/underpass along Branch 'B' at the subdivision 'B' Access Road will also be used. It is anticipated that when the muska lands are developed, a large drainage culvert will be installed at the golf course boundary at subwatershed 51B to carry runoff into Basin 5.

A set of pipe culverts are proposed to pass the 10-year flow beneath relocated Mango Tree Road. These culverts will be temporary until the muska drainage systems are implemented. A 10-year protection was used as required by the Oahu Sugar Company.
The State Department of Land and Natural Resources (DLNR) required that relocated Mango Tree Road be placed at existing grade. Flows exceeding the 10-year storm will override the roadway and enter the golf course. Contouring within the golf course will direct these flows either to Kali Stream (Branches 'A' or 'E') or to West Loch (Fort Weaver Road).

The golf course detention basins and outlets are used to control discharge and provide on-site storage. The storage and release requirements are based on the goals of the Kali Stream Technical Committee. For the interim period until the East Maui Reservoirs are completed, the Committee recommended minimal release of flows from the basins until on-site storage of approximately 60 acre-feet is obtained. Subsequently, the basin outflows are to be limited to the 2-year, 6-hour rate until on-site detention of approximately 300 acre-feet is obtained.

Runoff contributing to West Loch are routed to two basins before entering the two existing 54-inch culverts at Fort Weaver Road. Based on the Fernandez Village HGL of 29 feet, the initial capacity of these culverts is about 500 cfs. The culverts are not planned to be upgraded at this time since the routed 100-year flow does not exceed the 500 cfs limit.

The golf course is sized with sufficient capacity to pass the Plane 6 flow to Fort Weaver Road; however, improvements will be needed should the makua areas develop and add runoff to the golf course. The two culverts at Fort Weaver Road may need upgrading. An existing 42-inch water main crossing between Basins 8 and 9 limit the amount of runoff that may leave Basin 8.

Multiple HEC-1 computations were made to size the basins and outlets to allow passage of the 100-year flow while meeting the Technical Committee's recommended storage volumes and controlled outflow rates. The resulting discharges for interim and ultimate conditions are shown in Table 5-1. Flooding from Kali Stream will be controlled ultimately by increasing capacity at the ORML Railroad right-of-way and excavating drainageways through the golf course.

The FEMA flood map revision that reflects the interim conditions described herein became effective on March 21, 1995 (Reference 16). A request for flood map revision to show the ultimate conditions is planned to be submitted to FEMA in the near future.

4.3 Backbone Drainage System

The backbone system consists of major pipe and box culverts which convey on-site generated runoff from the subdivision systems, as well as a portion of the golf course, to the ORML Railroad bridge. The middle portion of the golf course below Subdivision "B" does not accept any off-site runoff and is considered a part of the backbone system (rather than part of the regional system). Figure 4-2 illustrates the layout of the backbone drainage system. Drain line and node locations are indicated for cross-referencing with the discharge, invert and HGL data in the appendices.

The backbone system includes facilities sized to convey runoff from the off-site area west of the project site.
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<td>Basin No. 3 Drainage laterals</td>
<td>80</td>
<td>104</td>
<td>251</td>
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</tbody>
</table>

1) Discharges relate to volume of overland flow from the upper watershed.
2) Includes the drainage area tributary to the drainages.
3) Residential use only since the drainage area is less than 100 acres.
4) Includes 152 acres for Subwarf 016, 018, 020, and 021.

**TABLE 5.1**

**SUMMARY OF DISCHARGES**

### SUMMARY AND CONCLUSION

**3.1** Summary

The Kansas Village project is a 400-ground housing development coordinated by the City and County of Honolulu, Department of Planning and Development, with technical assistance from the University of Hawaii. The project

### 3.2 Conditions

It is concluded that the proposed drainage systems will adequately serve the proposed project. The regional system improvements will further improve the system's ability to handle the increased runoff volume. The proposed system is consistent with the City's Drainage Standards.

LIST OF REFERENCES
APPENDIX B

Kaloi Gulch Technical Committee Reports
KALOI GULCH TECHNICAL COMMITTEE
INTERIM REPORT

June 1993

KALOI GULCH TECHNICAL COMMITTEE
INTERIM REPORT

Introduction
Development of various projects within the Kaloi Gulch watershed requires coordination of drainage improvements through and between the projects. These drainage improvements must accommodate both the interim and ultimate conditions faced by the developments. Presently, very little surface runoff reaches the makai properties or coastal waters. At full development, however, substantial runoff is expected to flow all the way to the ocean. Estimated runoff quantities at full development based on the City and County Drainage Standards are indicated on Exhibit 1, Ewa District Runoff Map.

The Kaloi Gulch Technical Committee was formed to study the drainage requirements and the water quality issues of the projects and to recommend a coordinated plan for review and consideration by the various developers, that addresses both the interim and ultimate development conditions. The members of the technical committee include the engineers for the privately developed projects, representatives of the State and City projects, and representatives from the Drainage Section of the City and County of Honolulu Department of Public Works.

Background
The Kaloi Gulch watershed extends from the crest of the Waianae Range to the shoreline, encompassing approximately 11 square miles. Proposed development areas within the watershed include Campbel Estate lands; the State property; the City and County of Honolulu Department of Housing and Community Development’s (HCDO) Ewa Villages and Laulani projects; Ewa by Gentry; and Ewa Marina by Iasca. The limits of the Kaloi Gulch watershed and the land ownerships within the watershed are also identified in Exhibit 1.

Projects are in various stages of planning, design and construction. The immediate concern is the identification and implementation of an interim plan to facilitate ongoing improvements and mitigate the impact of greater conveyance of surface runoff to low-lying lands.

Conditions Before Urban Development
Prior to development, much of the Kaloi watershed was used for sugarcane cultivation by Dole Sugar Company (DSCO). Only the steep upper reaches of the watershed, the low lying areas near the shore, and the GSCD residential and retail facilities found between Mango Tree Road and the railroad right-of-way, were not cultivated.

Committee Members:
Richard Suzuki, Sunnie Tana - City and County of Honolulu Dept. of Public Works
Steve Thomas - State of Hawaii Housing Finance and Development Corporation
Greg Hiyakumoto - R.M. Towill Corporation
Tom Nance - Tom Nance Water Resources Engineering
Daniel Hong - Gray, Hong, Bills and Associates, Inc.
Danny Ehleman - ParEn, Inc. dba Park Engineering
Kay Muranaka, Craig Arakaki - Engineering Concepts, Inc.
Several subwatersheds converge above the freeway with their combined runoff passing through a large culvert. Between the freeway and Mango Tree Road, Kalo Gulch is generally a narrow, shallow, unlined ditch with limited capacity. Runoff from larger storms typically overtops the banks and spills into the adjacent cane fields. Additional restrictions are imposed at road crossings where culverts allow only minimal flows to pass through without overtopping the channel.

From a short distance above Mango Tree Road to its metal terminal, the Kalo Gulch channel is man-made and consists of two levees built above existing ground. The channel invert is a few feet above the adjacent ground. The capacity of the channel through this section is very limited and unable to accommodate large runoff under existing conditions. Runoff spills out of the channel at various places and runs through the cane fields and other areas. Limits of flooding depends on the storm intensity. The natural depressions in the cane fields, along cane haul roads, and other areas also currently act to provide some retention/detention areas for runoff.

The section of the channel from Mango Tree Road to the railroad r-o-w has limited conveyance capacity of about 800 cfs, primarily due to the culvert restrictions at both ends of this section. Its backwater effect causes significant overtopping just above Mango Tree Road with consequent flooding into Ewa Villages.

The lower portion of the channel, which extends from Ewa by Gentry into the Ewa Marine property area, is estimated to have a capacity of only 200-300 cfs without overtopping. The man-made channel ends at the moku end of the cane fields approximately 1500 feet from the shoreline. There is no natural detention at a drainageway below the end of the channel. This area of the Ewa Marine site is characterized by scrub brush and kahili trees. Ocean Beach Park is also located along the shore below the end of the channel.

Current Developments

Development of Ewa by Gentry began in 1988 and has several phases already completed and occupied. Its linear drainage measures include substantial onsite storage for retention/detention and also takes advantage of existing retention areas which limit runoff into the upper end of the project.

The initial improvements for the Ewa Villages are scheduled to begin soon. These improvements would eliminate the flooding of areas to be developed in the project, but the changes to the natural detention/detention features and elimination of flow restrictions will also result in the discharge of higher flows into the Ewa by Gentry project and the moku lands below the Gentry project.

Recognizing the limited downstream capacity of the existing Kalo Gulch, Ewa Villages and Ewa by Gentry have incorporated detention features within their projects. Both projects have golf courses which serve as the major drainageway through the projects. Although the drainageway through the golf courses is sized to accommodate the peak runoff, retention/detention of runoff generated on-site during smaller storms is also provided.

Despite incorporation of retention/detention within the Gentry and Ewa Villages projects, continued development will require that additional runoff be discharged into the moku properties prior to construction of full downstream improvements.

Interim Alternatives Considered

The interim period assumes that the Camelot Estate lands and the State of Hawaii property will remain in supercrane rather than be developed. The end of the interim period will occur when continuous adequate conveyance from Mango Tree Road to a shoreline outlet has been constructed. Revocation of drainage requirements will be necessary if the State of Hawaii or the Estate of James Campbell decides to begin development of their properties.

The following alternatives to address interim drainage conditions were considered:

1) No action - each developer would proceed independently.
2) Hold up development until Eva Marina constructs its marina.
3) Construct a drainage channel of adequate capacity to the ocean immediately.
4) Provide sufficient detention to keep runoff discharges to present levels.
5) Elimination of the present restrictions between Mango Tree Road and the railroad right-of-way and construction of temporary drainage improvements, including increasing the capacity of existing Kalo channel, to accommodate the resulting higher flows through the interim period.

Discussion of Alternatives

1) Alternative No. 1 may result in interim drainage improvements that are not coordinated, creating problems for adjacent developments. This is the present constraint to development today.
2) Alternative No. 2 would delay proposed developments for an unknown period and would be dependent on Eva Marine’s Development Schedule.
3) Alternative No. 3 is costly, would involve a long review and approval process, and results substantial funding. Pursuing this alternative would also delay present development.
4) Alternative No. 4 would require undesirable large land areas for retention/detention to keep flows to existing levels. In addition, large areas
of cane land would suffer crop damages and excavation of large basins at great expense would be required to provide enough storage volume.

5) Alternative No. 5 would result in more runoff being discharged makal of Eva by Gentry onto the Union and Eva Marika properties then currently being experienced which may impact the quality and quantity of runoff discharged. Recent trends of detention would be incorporated by the master developments to reduce the flow and improve water quality of runoff being discharged to the makal properties. Temporary improvements below Eva by Gentry and improvements to Kaiol Gulch would be required to accommodate flows during the interim period.

Recommended Interim Plan

The Committee recommends Alternative No. 5. This recommendation is based on the additional issues listed later in this report being resolved first.

To minimize the potential damages within the Eva Marika property due to increased runoff, retention/detention features shall be incorporated by all projects. The Eva Villages plan provides approximately 60 acre-ft of retention and 300 acre-ft of detention. Eva by Gentry would provide approximately 200 acre-ft of detention and 400 acre-ft of detention. Eva Villages and Eva by Gentry would impose permanent detention features within their respective projects. Each project would be responsible for meeting NPDES and water quality requirements and regulations before runoff leaves each project.

An interim drainage channel would be constructed from the makal boundary of the Gentry project to the existing Kaiol Gulch. Protection and impact to the EF27 wetland would be addressed. The required improvements to the existing Kaiol Gulch could consist of excavation below grade, widening of the existing flow system, or a combination of both. Further detailed studies are required to address the various details for a workable plan. Included in these studies would be the determination of the best location for providing additional detention capacity, either in the area above Eva Villages or some other location.

Since the improvements to Kaiol Gulch would be an interim solution, it is proposed that the capacity of the channel be sized for runoff from a 10-year storm under extreme land use conditions. The channel improvements would be designed to direct overflow from larger storms away from the existing residences and to the west side of the gulch. The actual details of the Kaiol Gulch improvements would be addressed during the design process.

Implementation Steps

1. Interim report to be distributed by the Public Works Department for review and comments by affected developers.

2. Resolution of additional issues.

3. Perform detailed studies.

4. Preparation and approval of Plans for Interim Improvements.

5. Construction of Interim improvements.

Utility Improvements

The major drainageway through the projects must be able to accommodate the peak flow as defined by Plate 6 of the Storm Drainage Standards of the Department of Public Works. Improvements through each project and mitigating impacts on water quality mandated by Federal, State or County laws, regulations, and standards are the responsibility of each project. Interconnection location and invents would be included in these coordination efforts.

Permanent detention facilities would be incorporated within each project to improve runoff water quality. Each project would be responsible for compliance with requirements of the NPDES permit and related water quality regulations.

Additional Issues

The committee has focused its attention on technical engineering issues related to drainage through the Kaiol watershed and its recommendations are based on engineering principles. The committee did not attempt to resolve nontechnical issues, but recognizes the need to resolve these issues before the recommended drainage improvements can be implemented. These include:

1) Responsibility for sugar cane crop damage;
2) Responsibility for the design and construction of Interim drainage improvements;
3) Maintenance of Interim drainage improvements;
4) Responsibility for potential damages due to increased flows.
5) Maintenance of ultimate improvements.
6) Responsibility of water quality controls.
TECHNICAL SOLUTION FOR POTENTIAL FLOODING IN THE KALOI GULCH DRAINAGE BASIN

September 18, 1997

A. MEMBERS

NAME               COMPANY/REPRESENTS
Craig Arakaki     Engineering Concepts, Inc./Ewa Malal West, Gentry
Makoto Fukagawa  Department of Public Works/City
Greg Hiyakumoto  R. M. Touel Corporation/Ewa Villages
Davide Hong     Gray, Hing, Bills & Associates, Inc./Massino
Felix Limaco     Limaco Consulting Group/Hastings
Kay Muramatsu    Engineering Concepts, Inc./Campbell Estates
Tom Harace      Tom Harace Water Resource Engineering/Gentry & Coral
Richard Suzuki   Department of Public Works/City
Melvin Takahura  Department of Public Works/City
Denaos Teyama    Department of Public Works/City
James Yamamoto   R. M. Touel Corporation/State

B. BACKGROUND

As a follow up to the September 4, 1997 meeting involving the City and developers within the Kaloi Gulch Drainage Basin, a technical group was formed to derive a technical solution for potential flooding in the Kaloi Gulch Drainage Basin. The group was given until September 18, 1997 to prepare recommendations.

As experienced in November 1996, flooding of the Ewa Villages project in the Kaloi Gulch Drainage Basin occurred due to the lack of an outlet to the ocean. Development is presently required to provide detention basins for the storage of storm water runoff within the respective projects. During time of heavy storms, the volume of storm water runoff may exceed the storage capacity of the retention basins and cause flooding in the area, as occurred in the November 1996 storm. As such, it is the intent of this technical group to develop a plan to pipe runoff to the ocean to provide a degree of flood protection for the existing developments.
As a starting basis, the group was faced with the following timelines:

1) Passing of 1,200 cfs to the ocean by January 1998.
2) Passing of 2,500 cfs to the ocean by January 2000.
3) Passing of 11,500 cfs to the ocean by the year 2003.

C. TECHNICAL SOLUTION

In developing the Kuki Gulch Drainage Basin the following conditions were delineated for the stated timelines.

1) The maximum allowable hydraulic grade line within Haseko’s basin will be limited to an elevation of 11 feet.
2) The access road to Oneula Park shall be raised and bermed within Oneula Park to convey 2,500 cfs from Haseko’s basin to the ocean and to protect the existing Ewa Beach residences.
3) The overflow weir elevation from Haseko’s 15 acre retention basin (crest = 3 feet) to Oneula Park will be set at an elevation of approximately 8.5 feet. Measures to convey the overflow to Oneula Park shall be designed to protect the existing Ewa Beach residences.
4) The channel invert at the Haseko/Ewa-Makai West interface will be set at an elevation of 10 feet. The channel within Haseko’s property shall be designed to convey 1,200 cfs with a headboard capacity of 2,500 cfs and maintaining a hydraulic grade line of 10 feet as shown in Exhibit A.
5) The channel invert at the Ewa-Makai West Gentry interface will be set at an elevation of 14 feet. The channel within Ewa-Makai West property shall be designed to convey 1,000 cfs with a headboard capacity of 2,500 cfs as shown in Exhibits A and B. Any modifications to the channel will require the approval of all parties involved in this agreement.
6) Man-made diversion of storm water runoff to the west of the existing Kuki Gulch berms shall not be allowed.
7) At the Ewa Vitages/Gentry interface a drainage structure designed to convey 2,500 cfs shall be constructed.
8) Each property owner will be responsible for the design and construction of all necessary improvements on their respective properties.

The passing of 11,500 cfs will take place tentatively at the year 2005 to provide a permanent outlet to the ocean, unless otherwise noted.

D. SUBMITTED

We the undersigned acknowledge and agree to the conditions presented herein and fully endorse this technical solution.

[Signatures and dates]

[Divisions of Engineering]

[City and County of Honolulu (Coordination)]

[Subject to our letter dated 7/6/97]

[Date 9/11/97]

[Revision Concept, Inc. (Ewa-Makai West)]

[Date 9/28/97]

[Date 9/28/97]

[Jay, Hong, Bills & Associates, Inc. (Haseko)]

[Date 11/18/97]

[Englewood Concepts, Inc. (Campbell Estates)]

[Date 11/18/97]

[Date 9/14/97]

[Date 12/8/97]

[Tom Nase Water Resource Engineering (Gentry and Coral Creek Golf Course)]

[Date 9/14/97]

[Date 9/28/97]

[Date 9/14/97]

[All Participants]
Technical Memorandum
Kaloi Gulch Interim Drainage Plan for North-South Road,
Phase 1, Kapolei Parkway to Farrington Highway
June 4, 2002

Mr. Brian M. Minasi
Director of Transportation
State of Hawaii
Department of Transportation
469 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Minasi:

Technical Memorandum, Kalihi Gulch Interim Drainage Plan, North South Road Phase 1, Kapolei Parkway to Farrington Highway

This is in response to your letter of April 10, 2002, regarding a proposed technical memorandum for hydrology for the Kalihi Gulch Interim Drainage Plan.

We have reviewed the technical memorandum and its addendum, which was submitted by R.M. Towell Corporation on May 24, 2002.

As submitted, the interim drainage plan for Phase 1 of the North South Road Project is acceptable.

Should you have any questions, please call Scott Nakamura of our Site Development Division at 327-6247.

Sincerely yours,

[Signature]

RANDALL K. KUBOTA
Director of Planning and Permitting

RKF by
1151991
ct: R.M. Towell Corporation

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Mr. Randall Fujiki, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Attention: Mr. Bob Sumitomo

Subject: Technical Memorandum, Kalihi Gulch Interim Drainage Plan, North South Road Phase 1, Kapolei Parkway to Farrington Highway, Hydrology for the Interim Drainage Plan, Kapolei, Oahu, Hawaii

We are pleased to submit the enclosed Technical Memorandum describing our proposed hydrology for the Kalihi Gulch Interim Drainage Plan for your concurrence. Your expedient review and comments will facilitate the continuation of the permitting and design of the North South Road project.

A response by April 26, 2002 would be greatly appreciated.

Should you or your staff have any questions please call Craig Winter at 692-2551, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

[Signature]

BRIAN K. MINASAI
Director of Transportation

Enclosure.

cc: R.M. Towell (G. Hyakumoto)

IHW-05 2.6579

APR 2002

96813
TECHNICAL MEMORANDUM
KALOULI GULCH INTERIM DRAINAGE PLAN, NORTH SOUTH ROAD PHASE 1, KAPOLEI
PARADISE TO EWA VILLAGE HIGHWAY
HYDROLOGY FOR THE INTERIM DRAINAGE PLAN

DATE SUBMITTED: March 7, 2002
PROJECT: NORTH SOUTH ROAD
PREPARED BY: R. M. Twedt Corporation
PREPARED FOR: Department of Transportation, State of Hawaii

Purpose
This Memorandum describes the proposed interim drainage plan hydrology of Kaloli Gulch that will be used in the North-South Project.

Background
The original North-South Road drainage system was integrated into the Housing and Community Development Corporation of Hawaii (HCDC) East Kapolei Project’s Drainage System for Kalihi Gulch. Due to the change in the housing market, the HCDC has deferred the development of their East Kapolei Project. The date when the proposed East Kapolei development will proceed is undetermined at this time.

The Department of Transportation (DOT) of the State of Hawaii intends to continue with the planning and design of the North-South Road Project and construct the road prior to the re-start of the East Kapolei Project. An interim drainage plan for Kaloli Gulch is required to design and construct the North-South Road until the drainage improvements for the proposed East Kapolei Project are completed.

Interim Drainage Plan

The North-South Road will cross Kaloli Gulch approximately 2,000 feet south of Farrington Highway. The road grade will be higher than the existing grade of the gulch. Most of the Kaloli Gulch storm runoff will flow to the east of the North-South Road and the rest will flow within the stream channel to the west. A culvert will be constructed to allow the North-South Road to cross the Gulch to maintain the Kaloli Gulch streambed and allow runoff to flow from east to west. The culvert will be sized to convey the flow determined by the interim drainage plan hydrology. The remainder of the runoff on the east side of the North-South Road will be conveyed within a channel sized for 3,500 cubic feet per second (cfs) according to the Interim Agreement of the Kaloli Gulch Flood Task Force or the flow to the boundary of the Ewa Village Golf Course.

A second culvert is required where Kaloli Gulch once again crosses the North-South Road at the northwest corner of the Ewa Village which is the Kaloli Gulch entrance to the Golf Course. This culvert will be sized to convey the remainder of the flow for the drainage basin. Subarai box will be restricted during the interim until the regional drainage system for Kaloli Gulch is renewed. A detention basin sized for the increase in runoff generated by the North-South Road project will be constructed at the Kaloli Gulch entrance to the Ewa Village Golf Course. A new 40-foot drain will be constructed to discharge the storm runoff into the Ewa Village Golf Course.

Interim Drainage Plan Hydrology

The proposed interim drainage plan hydrology to be used for the North-South Road drainage analysis is based on the existing drainage patterns defined in the Ewa Village Drainage Master Plan. The existing drainage patterns are shown on Figure 3-2 (marked) of the Ewa Village Drainage Master Plan. Figure 3-2 shows Subareas 1-4, 13, 14, 22, 24 and 51 will drain into the Ewa Village Golf Course from within or from the east side of Kaloli Gulch. The runoff is then flowing to the Golf Course except for the flow within the stream channel.

The proposed North-South Road culvert at the Kaloli Gulch crossing will convey the flow calculated in the Ewa Village Drainage Master Plan for the stream channel. The calculated channel flow is 800 cfs. This flow will be allowed to pass under the North-South Road at the second culvert near the Golf Course. The remainder of the Ewa Village calculated for Subareas 1-4, 13, 14 and 22 - 51 will remain in the east side of the North-South Road and flow within the 2,000 cfs channel to the proposed basins or sheet flow to the Ewa Village Golf Course. Subareas 13, 22, 24 and 51 will be realigned from flowing to the Golf Course by reducing the flow of the second culvert to the calculated channel capacity of 800 cfs. The ultimate capacity of the culvert will be sized to drain subareas 5 - 12, 15 - 21, 23, 25 and 26.
APPENDIX K

HAZARDOUS MATERIALS TECHNICAL REPORT
HAZARDOUS MATERIALS
TECHNICAL REPORT

September 1997

PARSONS BRINKERHOFF
KAKU ASSOCIATES
R.M. TOWILL CORPORATION


Prepared for:
State of Hawaii
Department of Transportation
1099 Punchbowl Street
Honolulu, Hawaii 96813

City and County of Honolulu
Department of Transportation
Pacific Park Plaza
711 Kapalani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Submitted by:
Parsons Brinkerhoff Quad & Douglas, Inc.
Pacific Tower, Suite 3000
1001 Bishop Street
Honolulu, Hawaii 96813

September 1997

PBDD Reference: 16218A - Product 84A
1. INTRODUCTION

The Federal Highway Administration (FHWA) and the Highways Division of the State of Hawaii Department of Transportation (HDDOT) are proposing to construct North-South Road, a divided multi-lane arterial, in Ewa, Oahu, Hawaii (see Figure 1). This roadway would connect the H-1 Freeway with a future segment of Kapolei Parkway, a distance of approximately 3.6 km (2.2 miles). The proposed project also includes a North-South Road interchange with the H-1 Freeway.

This Hazardous Materials Technical Report resembles a Phase I site assessment that identifies reported and obvious potential hazardous material conditions that may affect the construction of the proposed project. This assessment does not provide a definitive determination of the actual presence or absence of contamination, and would not meet "innocent landowner" provisions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that establish a defense for the purchase of real property. It does not report the presence of asbestos-containing material, lead-based paint, and radon, and does not guarantee, imply, or assert that all potential contaminant sources have been located because of the possible presence of unlisted contaminant occurrences.

2. ASSESSMENT METHODOLOGY

The study area for the environmental site assessment extends laterally east and west from the centerline of the proposed North-South Road to a maximum distance of 1,000 m (one mile).

This report includes:

- Review of federal and State environmental databases that report potential contaminant sources. The database search was conducted by Environmental Database, Inc. (EDB), in accordance with the American Society for Testing and Materials (ASTM) standards for environmental site assessments (E1527-93).
- Review of Hawaii Department of Health (DOH) files on sites identified in the database search and on sites identified from the site reconnaissance (see below).
- Review of historic maps of the project area to identify past land uses.
- Review of available historic aerial photography of the project area to identify past activities.
- Review of existing reports of the area that describe land uses, geology, hydrogeology, contaminant occurrences, and other information that may be used to assess the potential occurrence of hazardous materials along the alignment.
- A site reconnaissance to confirm listed potential contaminant source locations and identify additional unlisted potential contaminant sources.
3. ENVIRONMENTAL SETTING

The project site is located on the eastern end of the Ewa plain within the coastal plain. The coastal plain consists of ancient coral-reef rocks interbedded with thin layers of alluvial and marine sedimentary deposits, and is referred to as caprock. These layers are built upon the basalt cone of the Wai'anae Volcanic. Worldwide climatic changes and tectonic adjustments led to large fluctuations in the mean sea level resulting in this layered structure.

U.S. Geological Service boring located 160 m (525 ft) north and 480 m (1575 ft) southeast of the project area musk of Ewa Village encountered groundwater at 26 m (84 ft) and 23 m (75 ft). Groundwater underlying the project area occurs in two aquifers. The caprock aquifer is generally poor to good for potable use and is used mainly for irrigation and industrial purposes. The caprock aquifer is recharged by rainfall, stream infiltration, seawater intrusion, irrigation return flow and basaltic aquifer leakage.

The basalt aquifer belongs to the Eastern Oahu Basalt Aquifer, which is an EPA designated sole source aquifer. It is part of the Pearl Harbor area and serves as one of the main sources of drinking water for Oahu's population. The freshwater in the basalt aquifer is recharged in the Waianae Mountains and the central plain by direct rainfall, infiltration of streamflow and irrigation water.

The general direction of groundwater flow in the Ewa area is southeast from the central plain to the coast.

4. EXISTING CONDITIONS

4.1 Database Search

The databases that were searched and the results are described below:

1. Federal National Pesticide List (FNP/L)/Superfund Sites. This database lists those sites that pose an immediate public health hazard and where an immediate response to the discovery was necessary. These sites are also found in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) database, known as CERCLIS. This database, prior to this study, was last updated on September 30, 1995. The FNP/L database search did not identify any sites within 1,000 m (one mile) of the proposed North-South Road.

2. CERCLIS Sites. These sites are usually abandoned or inactive hazardous substance sites that are under review by the U.S. Environmental Protection Agency (EPA) to determine the extent of public health hazard. This database, prior to this study, was last updated on September 30, 1995. The CERCLIS database search identified one site within 1,000 m (one mile) of the proposed North-South Road.

3. Emergency Response Information System (ERIS) Sites. The ERIS database lists reports filed by local emergency response agencies, such as fire and police departments, county agencies, state agencies, and federal agencies that respond to...
hazardous material release situations. This database, prior to this study, was last updated on March 31, 1996. The ERHS database search did not identify any sites within 1,500 m (one mile) of the proposed North-South Road.

4. Resource Conservation and Recovery Act (RCRA) Treatment, Storage, or Disposal (TSD) Facilities. These sites have permits to treat, store, or dispose of hazardous waste. The database prior to this study was last updated on November 31, 1995. The TSD database search did not identify any sites within 1,500 m (one mile) of the proposed North-South Road.

5. RCRA Generation Facilities. The sites listed on the database are EPA identification numbers identifying them as generators of hazardous waste as defined by RCRA. These sites include:

- large quantity generators (LQG) that produce more than 1,000 kilograms per month of hazardous waste; and
- small quantity generators (SQG) that produce more than 100 kilograms per month of hazardous waste.

This database, prior to this study, was last updated on November 31, 1995. The RCRA database search did not identify any sites within 1,500 m (one mile) of the proposed North-South Road.

6. State of Hawaii Landfills. The sites listed on this database accept solid wastes, and are either active or closed. This database, prior to this study, was last updated on November 15, 1995. This database search did not identify any sites within 600 m (one-half mile) of the proposed North-South Road.

7. Regulated Underground Storage Tanks (RUST) Sites. These sites have a registered underground storage tank on site. The majority of these tanks store petroleum products. This database, prior to this study, was last updated on January 13, 1996. The RUST database search did not identify any sites within 1,000 m (one mile) of the proposed North-South Road.

8. Leaking Underground Storage Tanks (LUST) Sites. These sites have reported releases of stored product, usually petroleum hydrocarbons. This database, prior to this study, was last updated on January 13, 1996. The LUST database search did not identify any sites within 800 m (one-half mile) of the proposed North-South Road.

9. Permit Compliance System (PCS) Sites. The PCS supports the National Pollutant Discharge Elimination System under the Clean Water Act. This database, prior to this study, was last updated on September 1, 1992. The PCS database search did not identify any sites within 400 m (one-quarter mile) of the proposed North-South Road.

4.2 State of Hawaii Department of Health Files Review

The federal and State environmental database searches identified only one CERCLA site, Ewa Sugar Mill/Ohau Sugar Company, Inc. The record consisted of three locations that are labeled 1a, 1b and 1c as shown on Figure 2.

Data from the SHDOH was obtained for the site identified in the database search and other sites that may potentially affect the project. The type of data reviewed consisted of tank registration reports, documented environmental violations, general extent of contamination at the site, types of contaminants identified, contaminant concentrations detected, and status of remedial actions.

A Preliminary Assessment of Ewa Sugar Mill/Ohau Sugar Company, Inc. (1993) was reviewed at the SHDOH Office of Hazard Evaluation and Emergency Response. This report indicated that there are three locations of concern--the Ewa Sugar Mill (Site 1a), a pesticide storage, mixing and loading area located 1.9 km (1.2 miles) northwest of the sugar mill (Site 1b), and a coral pit located 2.9 km (1.8 miles) to the south of the sugar mill (Site 1c).

Some hazardous substances may have been used at the sugar mill's laboratory. The sugar mill was gradually dismantled between 1973 and 1983. Records were lost when ownership was transferred to the Oahu Sugar Company from Ewa Plantation Company.

The pesticide mixing, storage, and loading area is located in furrow sugarcane fields close to the proposed alignment. It was first used in 1953 until probably 1972. A statewide study of pesticide mixing sites concluded that there was a strong likelihood of groundwater contamination from discharge at the mixing site. A study by the University of Hawaii and the Hawaii State Department of Agriculture in 1992 (Hrusch et al., 1990) confirmed that soil in the area was contaminated with residues of common pesticides used by Oahu Sugar Company. Wells in the area both in the esopack and basalt aquifers also showed traces of pesticides such as atrazine in the groundwater.

The coral pit was used by Ewa Plantation and Oahu Sugar Company as a disposal site for municipal solid waste from the company's Ewa Village and industrial waste from the plantation's activities. It was also used for the disposal of empty pesticide drums and residue from decommissioned underground storage tanks.

4.3 Historic Maps

Three maps from the State of Hawaii Archives were reviewed to identify changes in area land uses and potential contaminant sources that may have been present in 1900 Map: 1:20,000 Ewa Quadrangle, Territory of Hawaii.

This map shows the area south of Renton Village, Varona Village and Fernandez Village. Fernandez Village is labeled "Filipina Village." Oahu Sugar Mill is present and the Oahu Railways and Land Company railroad alignment is shown prominently on the map. The remainder of the area is generally undeveloped, except for a number of cane haul roads which are still in existence today.
North-South Road Corridor Study


1933 Map. 1:24,000 Quadrangle. Territory of Hawaii

This map identifies the building used for pesticide mixing.

1938 Map. 1:24,000 Quadrangle, State of Hawaii

Interstate H-1 is shown on the map. No other changes were noted, except minor variations in Renton Village, Waimea Village and Fernalest Village. This map appears almost identical to the 1933 edition of this map.

4.4 Historic Aerial Photographs

Aerial photographs from 1933, 1937, 1947 and 1969 were examined to identify past activities in the area. The photos reveal little change between the oldest and newest photographs. Renton, Waimea and Fernalest villages remain in all the photographs and sugarcane farming is the dominant land use. The secondary canelana roads vary in location, but most of the major roads were in place in 1969. The 1933 photograph shows Kapalua Parkway under construction and land zoning has been seen by the recent housing developments near the sugar mill.

4.5 Petroleum Pipelines

Commercial pipelines are located near the project area. These pipelines originate at Campbell Industrial Park, located on the western side of Ewa, and end in Honolulu. Chevron USA's pipeline runs along Renton Road. (personal communication: Paul Tsing, Chevron USA Products Marketing Company.) A 10 cm (4-inch) gas pipeline belonging to BHP Gas Company also runs along Renton Road. (personal communication: Bob Poynt, BHP Gas Company.) There is no documentation of contamination associated with these pipelines in the project area.

4.6 Site Reconnaissance

The Ewa Sugar Mill/Banco Sugar Company site was examined further during a site reconnaissance on July 31, 1995 to confirm its reported location, assess the general 'housekeeping' at the site, and identify additional environmental concerns. In addition, the project area was surveyed to identify potential contaminated sites not listed in the databases, but appearing to have potential environmental concerns.

The site reconnaissance was performed from public access areas. Therefore, some of the areas were inaccessible. For example, the cooled pit and the petroleum mixing area are both located on private land. However, an abandoned concrete foundation at the petroleum mixing site was observed on a previous site visit.

The Ewa Sugar Mill has generally been demolished. A number of businesses, such as a welding company, automobile repair shops, and suppliers, and other industrial service type businesses, now occupy the remaining former mill buildings. The types and amounts of hazardous materials used by these businesses are uncertain but would generally consist of petroleum products.

No new sites were noted during the site reconnaissance.

September 1995

Page 7

Product 84A
5. POTENTIAL IMPACTS

Hazardous materials encountered during highway construction could affect soil, groundwater, and surface water within the construction area of North-South Road. These sites were identified as soil oxidation, slope stability, and construction impacts on the project.

The potential impacts of the project are as follows:

- Soil oxidation: The sites identified for this report include Sites 1a, 1b, 1c, 1d, and 1e, which are located approximately 1.73 km (1.1 miles) from the protected alignment.
- Surface water: The sites identified for this report include Sites 2a, 2b, and 2c, which are located approximately 3.6 km (2 miles) from the protected alignment.

Continuation of petroleum production pumping well bore approximately 300 meters from the site generates water and gases that were used by other drilling and production operations. However, the area site has not created the level of potential impacts from the drilling operations.

The commercial fuel products, located along the project area approximately 200 meters (650 feet) from the site, continue to pump water and gas production. The intent of the project is to stop the injection and production of water and gas from the sites. However, the area site has not created the level of potential impacts from the drilling operations.
APPENDIX L

ARCHAEOLOGICAL RECONNAISSANCE SURVEY
ARCHAEOLOGICAL RECONNAISSANCE SURVEY

October 1997

Prepared for
State of Hawaii
Department of Transportation
809 Punchbowl Street
Honolulu, Hawaii 96813

City and County of Honolulu
Department of Transportation
Pacific Park Plaza
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Submitted by
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Pacific Tower, Suite 3000
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October 1997

PBID Reference 16216A - Product 8.5A
ARCHAEOLOGICAL RECONNAISSANCE SURVEY
OF A 4.5-KILOMETER (14,730-FT.) LONG LAND CORRIDOR
WITHIN HONOLULII AHUPU'A,
EWA DISTRICT, O'AHU ISLAND

by
Hallett H. Hammett, Ph.D.
and
Rodney Chang, B.A.

Prepared for
PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

CULTURAL SURVEYS HAWAII
September 1997

ABSTRACT

At the request of Parsons Brinckerhoff Quade & Douglas, Inc., Cultural Surveys Hawaii has completed an archaeological reconnaissance survey of a 4.5-kilometer (14,730-
ft.) long land corridor in the ahupu'a of Honolulu in the Ewa District of Oahu. The corridor is proposed for a north-south-oriented roadway connecting the makai portion of
'Ewa to the H-1 Freeway. Virtually the entire corridor has been extensively graded repeatedly over the past century by the Ewa Plantation Company (which merged with the
Oahu Sugar Company in 1971) in association with sugar cultivation and the construction of plantation infrastructure.

Only two previously identified sites of archaeological and historic concern are in
the vicinity of the corridor: 1) the 'Ewa Villages Historic District (Site no. 50-80:12-9786)
which has been nominated for the National Register of Historic Places; and 2) the Oahu
Railway and Land Co. Right-of-Way which has been placed on the National Register of
Historic Places (Site no. 50-80:12-9714).

No prehistoric or early historic Hawaiian archaeological sites or surface finds were
encountered during the archaeological reconnaissance within the project area. Plantation
constructions - remnants of fences and ditches - and roadways were observed within
portions of the corridor that have not been developed since the sugar cane era. These
structures are not considered of historic value and therefore were not classified as sites
during the present survey. No further archaeological investigation is recommended for
the entire project area corridor and on-site or off-call monitoring is not justified during
future construction activities.

The present corridor does not directly impact the structures of the 'Ewa Villages
Historic District or the Oahu Railway and Land Co. Right-of-Way. However, the planning
of the road should be coordinated with the State Historic Preservation Division (SHPD) of
the Department of Land and Natural Resources to address possible concerns for indirect
impact.
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I. INTRODUCTION

A. Project Description

At the request of Parsons Brinckerhoff Quade & Douglas, Inc., Cultural Surveys Hawaii has completed an archaeological reconnaissance survey of a 4.5-kilometer (14,730-ft.) long land corridor in the anahulu of Honolulu in the Ewa District of Oahu (Figure 1). The corridor is proposed for a northeastsouth-oriented roadway connecting the mauka portion of Ewa to the H-1 Freeway. The mauka (south) end of the corridor commences 3.7 kilometers inland from the shoreline at Ewa Beach; elevation at this end of the corridor is 50 ft. above mean sea level. Beginning at the mauka end, the corridor runs mauka (north) along the west side of the Ewa Village Golf Course, traversing idle sugar cane fields, following the route of Palahua Road across Farrington Highway, and terminating mauka of the H-1 Freeway. Maximum elevation at the corridor's mauka end is 280 ft. above mean sea level. The corridor is generally 350 to 450 feet wide, but includes two larger land areas along its length. At the mauka end of the corridor is a trapezoidal-shaped parcel of approximately 100 acres. At its mauka end, the corridor broadens to include an approximately 231.4 acre parcel encompassing lands on both sides of the H-1 Freeway for a length of approximately 6000 ft. (1829 meters).
B. Scope of Work

The scope of work included:

1. Historical background review of existing historical and archaeological reports.

2. Reconnaissance survey of the corridor to assess existing conditions and to determine what portion of the corridor is not in present or former cane cultivation. Delineation of any archaeologically sensitive areas.

3. Preparation of a report to summarize the results of fieldwork, background studies, major archaeological and historic issues, and recommendations for future research and action.

C. Work Accomplished

Reconnaissance survey fieldwork was conducted on June 24 and 26, 1998. The entire length of the corridor was traversed by foot and vehicle. Photographs and field notes documented terrain and features of the corridor. A detailed topographic survey map (scale 1 in. = 50 ft.) of the project area provided by Parsons Brinckerhoff Quade & Douglas, Inc. facilitated assurance that all portions of the project area were inspected during the survey.

Background research included: a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources; studies of documents at Hamilton Library of the University of Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Archives of the Bishop Museum; and study of maps at the Survey Office of the Department of Land and Natural Resources.

II. NATURAL SETTING

The present project area corridor extends from ma‘uka to makai across the Ewa Plain in the kahua‘u of Honolulu. The Ewa Plain is a Pleistocene reef platform overlain by alluvium from the southern end of the Wai‘anae Mountain Range. This
Alluvium has supported commercial sugar cane cultivation for over a century and much of the present project area remains under cover of sugar cane (Saccharum sp.) which is no longer harvested.

The ‘Ewa Plain is hot and dry with an average mean temperature of 74°F and rainfall of 25 inches per year. Despite the aridity, the area is prone to flooding. Floods of 1916, 1917, 1923, and 1927 have been well documented by archival photographs, some of which show standing water as far as the eye can see.

III. HISTORY OF LAND USE WITHIN THE STUDY AREA

Traditional sources, the earliest maps and early archeological studies are mute regarding this portion of Honoluluii auhou‘au‘au. Kalii Gulch, which courses through portions of the study area corridor, is the only Hawaiian named land form within the project area which has been documented. Pukui (1986:77) translates the name to mean “the tarn patch” and Sterling and Summers (1978:35) relate a number of vignettes regarding the “Wahiawa” or “Punahou” hidden spring associated with Kali Gulch. Ida E.K. von Holt (in Sterling and Summers 1978:35) relates the amount of “two old Hawaiians” that the hidden spring “had been one of the principal sources of water for all that country, which was quite heavily populated before the smallpox epidemic of 1849.”

In discussing the trails of Honoluluii, John Papa li (1883:97) suggests that the most common traditional Hawaiian trail from the West Loch area to the northern Wahiawa coast was via Kolekole Pass. He mentions another trail from Pu‘u Pua (Pearl Harbor) to Pu‘u Kapolei and Waimanalo (‘Ewa). It seems most likely that this trail followed the route of the present Farrington Highway through Honoluluii and across the present study area.

Conversely taken by Protestant missionaries throughout the Hawaiian islands beginning in 1831 provide the earliest record of the size of the native population after the first decades of western contact. In the 1831-32 census of O‘ahu, the total population of Honoluluii is recorded as 1,026, comprising 428 adult males, 294 adult females, 112 male children and 92 female children (Schmitt 1973:19). A few years later, during the census of 1835-1836, the total Honoluluii population had dropped to 576, comprising 345 adult males, 294 adult females, 111 male children and 120 female children (Ibid.:22).

The earliest detailed map of the area (Alexander 1873) shows no habitation closer than the western edge of West Loch in the vicinity of Papappahi Point. The Monson farm survey map of 1878 documents substantial settlement at the “Honoluluii Taro Lands” in the Papappahi Point area and it seems clear that in early historic times that was the focus of the population of Honoluluii. The demimnents of the area - including fishponds, taro loi, abundant shellfish, and salt pans - would have focused population there in prehistoric times as well.

The Organic Acts of 1845 and 1846 initiated the process of the maka‘e - the division of Hawaiian lands - which introduced private property into Hawaiian society. In 1848 the crown and the ali‘i (royalty) received their land titles. The common people received their au‘ena (individual parcels) in 1850. At the maka‘e, the auhou‘au of Honoluluii (43,250 acres) was granted to the ali‘i Miriam Ke‘aki-Kuni Ke‘aka‘enobii (Royal Patent 607), Land Commission Award 11216, Apiana 8). Land Commission Awards (LCAs) for au‘ena to commoners in Honoluluii appear to have been located at Papappahi Point. No LCAs were recorded within any portion of the present study area.

In 1871, Ke‘aki-Kuni Ke‘aka’enobii rented much of Honoluluii to James Dowsett and John Meek for stock running and grazing (Frierson 1973:13). When James Campbell
paid $95,000 for most of Honolulu in 1837 he drove off the land 32,347 head of stock belonging to Dewott, Mock and James Robinson (tbl:13).

Until 1839 most of Campbell's lands in Honolulu were used exclusively for cattle ranching. At that time, one planter remarked "the country was so dry and full of bottomless cracks and fissures that water would all be lost and irrigation impracticable" (Ewa Plantation Co. 1923:6-7). But the capital of entrepreneurs like James Campbell, Benjamin Dillingham and W.R. Castle, along with the rapid development of artesian water, led to the creation of Ewa Plantation which was incorporated in 1860.

The first crop, 2,849 tons of sugar, was harvested in 1892. Ewa was the first all-artesian plantation and, in spite of early troubles, it gave an impressive demonstration of the use of artesian wells to supply the subsequent history of the Hawaiian sugar industry. (Kuppyendi 1967:69)

Contemporaneous with the establishment and growth of the Ewa Plantation was the development of the Oahu Railway and Land (O.R.&L.) Company, organized by Benjamin Dillingham in 1889, which connected outlying areas of Oahu to Honolulu.

During the last decade of the 19th century, the railroad would reach from Honolulu to Pearl City in 1890, to Waimanolo in 1895, to Waimanalo Plantation in 1898, and to Kahuku in 1899 (ibid:100).

During the 20th century, the Ewa Plantation would continue to grow and, by the 1930s, would encompass much of the eastern half of the Honolulu ahupua'a (see Figure 2 below). This growth inspired the creation of plantation villages to house the growing immigrant labor force working the fields. In the decade of the 1890s, the plantation built 72 houses, cLogginges or dwellings; in the first decade of this century, 536; in the second decade, 122; in the 1920s, 255; in the 1930s, 165; and in the 1940s, only 25. Censuses of the Ewa Plantation population recorded 4967 persons in 1928, 4177 in 1929, and 4100 in 1932. After the outbreak of World War II, which siphoned off much of the plantation's manpower, along with the changeover to almost complete reliance on mechanical harvesting in 1938, there was little need for the large multi-racial (Japanese, Chinese, Okinawan, Korean, Portuguese, Spanish, Hawaiian, Filipino, European) labor force that had characterized most of the early history of the plantation.

During the subsequent decades of the 20th century, sugar cane operations at Ewa Plantation have been phased out and, in recent years, former cane lands have been rezoned for residential development. Structures in the area of the former plantation villages have fallen into disrepair or have been demolished. However, portions of the area — including Varano Village, Tunney Village and Benton Village — have been designated the Ewa Villages Historic District (State site 50-50-12-9765) which has been nominated for the National Register of Historic Places (see Figure 4 below). Additionally, the still-extant O.R.&L. rail line through Honolulu has been placed on the National Register of Historic Places (Site 50-50-12-97144) (see Figure 2 below).

The above historical study suggests that the Ewa Villages Historic District and the O.R.&L. Right-of-Way are the only currently-identified areas of archaeological and historic concern in the vicinity of the present study area.

IV. PREVIOUS ARCHAEOLOGICAL RESEARCH

During a 1939 survey of Oahu for the B.P. Bishop Museum, J. Gilbert McAllister identified Site 146 in Honolulu ahupua'a:

Ewa coral plains, throughout which are remains of many sites. The great extent of old stone walls, particularly near the Poulos Salt Works, belongs to the ranching period of about 75 years ago. It is probable that the holes and pits in the coral were formerly used by the Hawaiians. Frequently the sand on the floor of the larger pit was used for cultivation, and even today one comes upon bananas and Hawaiian sugar cane still growing in them. They afford shelter and protection, but I doubt if previous to the time of Cook there was ever a large population here. (McAllister 1939:109)

McAllister's survey map places Site 146 in the general vicinity of the present study area, but this type locale is presently observable in Ewa more than 3 kilometers to the
southeast of the study area. The only other early documented site within the vicinity of the corridor was a Hawaiian Rapa Kapehe, located more than 3 kilometers to the west.

Beginning in the 1980s, archaeological research has been conducted in Honolulu in the general vicinity of the present study area. An archaeological reconnaissance survey (Rosendahl 1987) was conducted in association with the development of the 232-acre "West Loch Estates" Residential Increment I and II project, part of which lies to the east of the present study area. An archaeological reconnaissance (Kennedy 1988) and subsequent archaeological subsurface survey (Davis 1988) were conducted in association with the development of the 1016-acre "Ewa Gentry" project area which lies immediately to the east of the makai portion of the present study area.

The combined surface and subsurface reconnaissance survey of the "West Loch Estates" project area confirmed an initial impression that the project area had been extensively and almost entirely modified by decades of commercial sugar cane cultivation (Rosendahl 1987:9). This study identified a modern cemetery, two historic sites of minimal integrity and an ambiguous midden deposit (ibid:7:9). One of the historic sites recorded (7-3) was related to the plantation settlement of Lower Village. It was noted that some artifacts "indicate the possibility of pre-1900 occupation" (ibid:8).

In the "Ewa Gentry" project area the initial reconnaissance (Kennedy 1988) found no surface evidence of potentially significant cultural/historic remains. A subsequent subsurface exploration was undertaken. Eighteen backhoe trenches were excavated, however "no evidence of past site cultural activity was found anywhere in the Ewa Gentry project area" (Davis 1988:10).

In 1990, Cultural Surveys Hawaii conducted an archaeological reconnaissance survey of an approximately 616-acre area which included three extant plantation villages (Banton Village, Towne Village and Varona Village), the sites of three former plantation villages (C Village, Mill Village, Middle Village) and several other sites associated with the Ewa Plantation infrastructure..." (Hansatz et al.1990a). The survey found no evidence of any prehistoric activity within the project area and recommended further documentation of some of the raised plantation structure sites.

V. SURVEY RESULTS

Virtually the entire study area corridor (Figure 21) comprises land formerly under cultivation of sugar cane which commenced in the late 19th century (Figure 3). Since the cessation of cane production (the last harvest occurring within the present decade), portions of the corridor have undergone varied levels and types of development.

Makai End of Corridor to Farrington Highway

The makai end of the corridor commences outside of the Ewa Villages Historic District, approximately 300 meters northwest of the northwest corner of Varona Village (Figure 4). The corridor is also 400 meters north of the O.R.&L. Right-of-Way.

The east side of the corridor runs along the west side of the newly-developed Ewa Villages Golf Course, following the alignment of an asphalt-paved road that appears to have been constructed recently in association with the golf course (a golf course maintenance building is accessed by this road) (Figure 6).

The corridor's makai end encompasses an approximately 100-acre parcel adjoining the paved road to the west (Figure 6). The parcel remains planted in "raison" (no longer harvested) cane. It was traversed by foot and vehicle (along an access road bordering it from east to west). No archaeological sites or plantation-era structures were observed in this parcel.
At the north corner of the parcel, the corridor curves mauka (north) to Farrington Highway through now-idle cane fields, the route demarcated by an alignment of electricity lines (Figures 7 & 8). This portion was surveyed on foot. Visibility was excellent. No archaeological sites were encountered. Two plantation-era structures, however, were observed. A ditch following alongside a plantation road crosses the corridor 1500 meters mauka of Farrington Highway (Figures 9 & 10). The ditch is approximately 2 meters (6.6 ft.) wide and 1.5 meters (4.9 ft.) deep, and is constructed of cut stone with a mortar coating. It is in good condition within the corridor and continues intact considerable distances to the east and west of the corridor. Approximately 800 meters mauka of Farrington Highway, a flume remnant was observed on the west side of the corridor (Figures 11 & 12). The flume consists of half-round sheet metal supported by a brick and wood framework and is raised approximately 6 m. (2 ft.) above the ground surface. The flume remnant has been wrecked and other discontinuous remnants of the flume were observed continuing west beyond the corridor.
Farrington Highway to H-1 Freeway and Mauka End of Corridor

Mauka of Farrington Highway the corridor follows the route of Palehua Road mauka of the H-1 Freeway where the corridor broadens to include an approximately 231.4 acre parcel encompassing lands on both sides of the freeway for a length of approximately 6000 ft. (1829 meters) (Figures 13 & 14).

Two shallow gullies coursing through the corridor - Huncorne Gully to the west of Palehua Road and Kaioli Gully to the east - were inspected on foot. The northeast third of the parcel at the mauka end of the corridor, on both sides of the H-1 Freeway, comprises land that is currently being cultivated in non-sugar crops (Figures 15 & 16). The remainder of the open land within the corridor on both sides of the H-1 Freeway, which was inspected on foot, shows evidence of former sugar cultivation. Wrecked remnants of a frame alignment were observed on both sides of Palehua Road just makai of the H-1 Freeway (Figures 17 & 18).

No archaeological sites were observed in this portion of the corridor.

Figure 13 West side of corridor mauka of Farrington Highway in foreground showing Palehua Road and former cane lands mauka and makai of H-1 Freeway (view northeast).

Figure 14 East side of corridor mauka of Farrington Highway showing Palehua Road and former cane lands mauka and makai of H-1 Freeway (view northeast).
VI. SUMMARY AND RECOMMENDATIONS

A. Summary

The present 4.5-kilometer (14,330-ft.) long study area corridor is comprised of lands formerly in sugar cane cultivation that commenced at the end of the nineteenth century. Virtually the entire corridor has been extensively graded repeatedly over the past century by the Ewa Plantation Company in association with sugar cultivation and the construction of plantation infrastructure. Portions of the corridor follow routes of former plantation roadways.

No prehistoric or early historic Hawaiian archaeological sites or surface finds were encountered during the archaeological reconnaissance within the project area. (Other archaeological surveys on adjacent parcels within the oahuua of Honouliuli have identified no prehistoric occupation or utilization of the immediate area.) Plantation constructions — remnants of fences and a ditch — and roadways were observed within portions of the corridor that have not been developed since the sugar cane era. These constructs are not considered of historic value and therefore were not classified as sites during the present survey.

The malai portion of the corridor is in the vicinity of two previously identified areas of archaeological and historic concern: 1) the 'Ewa Villages Historic District (State site 50-80-12-9786) which has been nominated for the National Register of Historic Places; and 2) the Oahu Railway and Land Co. Right-of-Way which has been placed on the National Register of Historic Places (Site 50-80-12-9714).

B. Recommendations

No further archaeological investigation is recommended for the entire project area corridor and on-site or on-call monitoring is not justified during future construction activities.

The present corridor does not directly impact the structures of the 'Ewa Villages Historic District or the O.R.L. Right-of-Way. However, the planning of the road should be coordinated with the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources to address possible concerns for indirect impact.
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March 8, 1996

Mr. Charles C. Swaney, Director
Department of Transportation Services
P.O. Box 1697
Hilo, Hawaii 96720

Dear Mr. Swaney:

SUBJECT: North-South Road Corridor Project, Paikule

Thank you for the opportunity to submit preliminary comments on the proposed roadway which will affect the North-South Road Corridor Project, Paikule.

Through telephone communications with Mr. Gregory Hee of your staff, we have been informed that this roadway is to be extended from Kona to Hilo, finalizing the layout and extending this historic property. It will be impossible to avoid a north-south corridor impact with this property, thus mitigation will be inevitable.

We look forward to working to minimize this impact in future consultations when more specific design plans are available. You might want to consult with the Kona Development Division to design this major roadway intersection with the North-South Corridor and within their planned corridor for design and mitigation ideas.

Sincerely,

[N. H. W. C.]

ON MEDIAN, Administrator and State Historic Preservation Officer

[Signature]
APPENDIX M

CULTURAL IMPACT EVALUATION
Cultural Impact Evaluation in Support of
the North-South Road and Kapolei Parkway Project,
Hoomaluhia Ahupua'a, 'Ewa District, O'ahu

by
Rodney Chingiugi, B.A.,
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for
Parsons, Brinckerhoff, Quade & Douglas, Inc.

Cultural Surveys Hawaii
April 2004
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A. Project Description
At the request of Parsons Brinckerhoff Quade & Douglas, Inc., Cultural Surveys Hawaii has undertaken a cultural impact evaluation of the North-South Road and Kapolei Parkway Project in the neighborhood of Honolulu in the 'Ewa District of O'ahu (Figure 1). The North-South Road portion of the project is proposed by the State of Hawaii Department of Transportation and comprises the construction of a limited-access, principal arterial roadway that would connect the Interstate H-1 Freeway to Kapolei Parkway. The Kapolei Parkway portion of the project is proposed by the City and County of Honolulu and comprises the construction of a portion of Kapolei Parkway between the intersections with North-South Road and Hanalei Road.

The proposed project comprises a single, approximately 15,000 ft. (4.6 kilometers) long corridor which is the subject of the present cultural impact evaluation.

B. Scope of Work
The scope of work included:
1) Examination of historical documents, land commission records, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.
2) A review of the existing archaeological information pertaining to the general region as it may allow us to reconstruct traditional land use activities and identify and describe the cultural resources, practices, and beliefs associated with the harbor area prior to conversion.
3) Contact persons knowledgeable about the historic and traditional practices in the project area and region by letter and telephone. We anticipate a few informal interviews possibly to include O'ahu Island Board Council members, former plantation workers, Campbell Estate personnel, State Historic Preservation Division staff, Hawaiian Civic Club members, and Neighborhood Board members.
4) Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed actions on the cultural practices and any features identified.

C. Work Accomplished
Field inspection of the project area was conducted on April 1, 2004. The corridor was inspected by foot and vehicle.

Background research included: a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources; studies of documents at Hamilton Library of the University of Hawaii, the Hawaii State Archives, the Mission House Museum Library, the Hawaii Public Library, and the Archives of the Bishop Museum; and study of maps at the Survey Office of the Department of Land and Natural Resources.

Figure 1 Portion of USGS 7.5 Minute Series Topographical Map, Ewa and Schofield Barracks Quadrangles, showing project area (blacked)
II. TRADITIONAL LAND USE IN HOUNOUULI ALUPO'A

A. The Physical Layout

The present project area is located in the alupau'a of Honouuli, the largest traditional land unit on the island of O'ahu. Honouuli includes all the land from the western boundary of Pearl Harbor (West Loch) westward to the 'I'alewa'alewa District Boundary, with the exception of the west side of the harbor entrance which is in the alupau'a of Pa'oa (the 'I'alewa'alewa Point area). This comprises approximately 12 miles of open coastline from Oni'a westward to Pili O Kaha. The alupau'a extends south from West Loch nearly to Schofield Barracks and the western boundary is the Waianae Mountain coast running eastward to the east ridge of Kaala Valley.

Not only does Honouuli boast a long coastline along the normally eddy waters of Pearl Harbor, but there are four miles of waterfront running along the west side of West Loch. The land immediately inland of the main coast consists of a flat karstic interior limestone reef forming a level, nearly featureless "cliffs" plateau covered in pre-contact times by a thin or non-existent soil mantle. The microwindography is notable in containing countless sinkholes in some areas, created by chemical weathering (dissolution) of the limestone itself. Proceeding inland, this plateau is overlain by alluvial deposits through a series of gorges draining the Waianae Mountains. The largest of which, Honouuli Gulch, is on the east side of the plain draining into West Loch. To the west are fairly steep gradient gullies forming a more linear than dendritic drainage pattern. The major gullies are those east to west Awa a, Pahale, Makaha, Waipio and Lomaha. These gullies are steep-sided in the uplands and generally of a high gradient until they emerge onto the flat 'I'alewa'alewa plateau. The alluviation they have carried has spread out in delta fashion over the inland portion of the plain. These gullies are generally dry, but during autumn seasons they carry immense quantities of runoff onto the plains and into the ocean. As typical drainages in and styles, they neither raging uncontrollably or dry up, and in such do not form stable water sources in their upper reaches. These gullies do not have valleys suitable for extensive irrigated agriculture. However, this lack is more than compensated for by the rich,未曾landed at the base of Honouuli Gulch (the 'I'alewa'alewa)

Honouuli Alupau'a, as a traditional land unit, had tremendous and varied resources available for exploitation by early Hawaiians. The "karstic drainages" and marginal characterizations of the limestone plain (which is the most susceptible viable terrain) does not do justice to the alupau'a as a whole. The following available resources mark the richness of this land unit:

1. Twelve miles of coastline with continuous fringing reef, which offered rich marine resources.
2. Four miles of shoreline on the waters of West Loch, which offered extensive fisheries (mullet, o'opu, shalling) as well as foraging suitable for development of Leho'ohana, Loomah for example.
3. The lower portion of Honouuli Valley in the 'I'alewa'alewa offered rich level alluvial soils with plentiful water for irrigation from the streams as well as abundant springs. This land would have stocked well up the valley.
4. A broad limestone plain, which because of immemorable limestone sinkholes, offered a nesting home for a large population of avifauna. This resource may have been one of the early attractions to human settlement.

B. The Coastal Zone

1. Ka'a'a (Barber's Point)

Archaeological research at Barber's Point has focused on the coastal area and around the recently excavated Deep Water Harbor. A series of small charred shellfish, enclosures and platforms show limited but recurrent use at the beachfront zone for marine exploitation. This settlement covers much of the shoreline, with some enclosures and features around small sandy coves and wet sinks. Immediately behind the shoreline and a linear dune deposits is a broken cultural layer believed to contain some of the earliest habitation evidence in the area.

The attraction of the area to early Hawaiians was the plentiful and easily exploited bird population. Particular evidence for fishing at the site is located 1 km south of the project area (Honouuli and Ford 1981:31). Extensive harvesting of marine mollusks and other species, in conjunction with habitat destruction, probably led to early extinction of these bird communities.

There is some indication of agriculture in small plots and water wells. Considering rainfall, this activity would have been constrained by accessibility to water, probably another tree grove and more (sweet potatoes). The chronological context of the sites indicates a major focus on marine resources.

Barber's Point (1980:135), in his Ph.D. dissertation, stresses our knowledge of traditional Hawaiian use of the coastal zone of Honouuli.

I suggest the west coast of O'ahu, including the area off Barber's Point, (a) probably because a well established habitat at least by AD 1000, perhaps much earlier; (b) the initial settlement at Barber's Point also began around this time or possibly earlier; and (c) the settlement involved task-specific groups exploiting the adjacent fishery on a seasonal basis, probably during the winter months.

2. Ke'olau (West Beach)

Settlers associated with the Ke'olau area, which includes the western portion of the present project, document around 200 component features that are apparently 50 sites and site complexes consisting of habitation sites, gathering areas, and hunting bands. Chronologically, the occupation covers the entire span of Hawaiian settlement, as seen by Davis and Hearn (1957:37) describe in "caves of the longest local sequences in Hawaiian prehistory." The earliest part of the sequence relates to the discovery of an inland mouth but early dates were also obtained for a beachfront site and an inland rock shelter.

Traditional Land Use in Honouuli Alupau'a

5. An extensive upland forest zone extending as much as 12 miles inland from the edge of the coastal plain. As Finlay and Hindsy (1972:659) have pointed out, the forest was much more distant from the coastline than it was on the windward side, but on the lee side was more extensive. Much of the upper reaches of the alupau'a would have had species diverse forest with koa, ike, 'ilima, 'ao'o, 'ohe, etc.

Within this area setting archaeological and traditional sources show a pattern of three main areas of settlement within the alupau'a in the coastal zone including Kahalua (Barber's Point), Ko'olau (West Beach), and Onie'a ( 'I'alewa'alewa Point). Each of these three has a different focus on marine resources.
Traditional Land Use in Honolulu: Aka'au'a

C. Houohuli'aua (Aka'au'a) Traditional Land Use

Centered around the west side of Pearl Harbor at Honolulu Stream and its broad outlet into the West Loch are the rich irrigated lands of the 'au'au Beach which give the ahu'a its name. This area borders on the west of the town of Honolulu and is a part of the Honolulu area. The area is characterized by the abundance of fish and shellfish resources in close proximity to a wide expanse of well-irrigated land suitable for wetland rice cultivation. As early as 1682 all the roads of southeast Oahu were crossing and descending the hill in the valley of the valley which gave the district of Houohuli'aua its name. Dick's (1877-78: 79) concludes, on the basis of 12 carbon isotopic data and 3 volcanic glass data that the "Agricultural use of the area spans over 8,000 years.'"

Undoubtedly, Honolulu was a locus of habitation for thousands of Hawaiians. Prohibitive population estimates are a source of some debate but it is worth pointing out that in the earliest missionaries, circa 1810-1812, the land around Honolulu contained 1026 men, women, and children (Schmitt 1972:24). It is not clear whether this population estimate is for Honolulu Village or the village probably consisted of the majority of the district's population. The nature of the reported population estimate for Honolulu (less than 3% of the population of the district) and the fact that the population decreased more than 50% in the next 4 years (Schmitt 1972:22) suggests that the pre-contact population of Honolulu Village may have been significantly greater than it was in 1810-1812.

D. Pua'Ke'au'a: Inland Settlement

Description of inland settlement in Honolulu: Aka'au'a is more problematic in the general scheme of archaeological studies. However, it is probable that the area around Pua'Ke'au'a, on the east side of the Waianae Ridge, was a Hawaiian place of some importance.

In 1990, Hawaiian Newspapers "Ku Loa Kohola" reports a story of Pua'Ke'au'a as "a place where chiefs lived in ancient times" and a "symbolic, "Kaukau" (symbolically populated." The article summarizes:

1) This place was entirely deserted and left uncultivated and it remains that this happened before the coming of Europeans to Hawai'i. Not an inhabitant is left.

2) The descendants of the people of this place were mixed that they were all of one place. Thus the gods became attached and returned to Kukui (in [Sterling and Semlitsch 1978:33]).

McAllister (1933a, 130) recorded three sites in this area: two at Pua'Ke'au'a, and one at Kua'au (both decaying), and most interesting, a series of evidences in Kahala which he calls "Aloha's atua." There is no direct archaeological evidence available that Hawaiian settlement occurred here but exhaustive settlement appears likely from traditional accounts. Geographically, the area is well-watered and would have had abundant locally available forest resources.

E. Summary of Settlement Patterns in Honolulu

Based on the above summary of area of Honolulu settlement the following general considerations are made to place the project area in the context of the ahu'a's settlement pattern. These are three tiers of Hawaiian settlement in the ahu'a, two are well-documented while one is more problematic:

a. The extensive limestone plain with numerous habitations for fishermen and harvesters and summer gardens;

b. The rich cultivated lands of Houohuli'aua's 'au'au for extensive wetland rice and clearly the ahu'a's population center;

c. The uplifted mound at Pua'Ke'au'a for present occupation but probably agriculture and forest resource collection.

Houohuli'aua, as a unit, contains all the geophysical elements of a typical Hawaiian valley ahu'a, except they are arranged geologically in an atypical relationship. The ahu'a is not equidistant around a single drainage network but shares the two distinct areas of Waianae drainage in its upper reaches. A highly advantageous characteristic for human habitation is included in a vast expanse of forests, as well as an extensive lagoon plan that would support only limited agriculture but would be excellent for food gathering in early times, and a large expanse of sloping forest land. The inland location for fishing would be adequate for wetlands and streams, and the high expanse of slopes for forest land. The inland location for fishing would be adequate for wetlands and streams, and the high expanse of slopes for forest land.
III. HISTORIC DOCUMENTATION OF THE PROJECT AREA

Traditional sources, the earliest maps and early archaeological studies are mute regarding this portion of Honoluli. Kahoa'a, Kaka'i Gulch, which courses through portions of the present study area, is the only documented Hawaiian-named land form associated with the study area. Pokini (1834:77) translates the name to mean "the twin patch" and Sterling and Simmons (1911:10) relate a number of vignettes regarding the "Waiawa" or "Ponamu" hidden spring which is associated with Kahoa'a Gulch. U.S. v. Wei Hoo, Sturdivant, and Simmons (1900:355) relates the account of two old Hawaiians that the hidden spring "had been one of the principal sources of water for all that country, which was quite heavily populated before the smallpox epidemic of 1846."

In discussing the trails of Honoluli, John Papa Pi'ikea (1834:97) suggests that the most common traditional Hawaiian trail from the Waiawa area to the northern Waianae Coast was via Kokoaulo Pass. He mentions another trail from Pu'u Hule (Paul Halaby) to Pu'o Kapoki and Waimanu ("Ewa"). It seems most likely that this trail followed the route of the present Farrington Highway through Honoluli and across the present study area.

Corresponds taken by Protostat measurements throughout the Hawaiian islands beginning in 1831 provide the earliest record of the size of the native population after the first decades of western contact. In the 1831-32 census of 17,688, the total population of Honoluli was recorded as 1,070, comprising 428 adult males, 394 adult females, 147 male children and 92 female children (S Kim 1935:19). A few years later, during the census of 1835-1836, the total Hawaiian population had declined to 978, comprising 345 adult males, 294 adult females, 111 male children and 120 female children (S Kim 1935:22).

The earliest detailed map of the area (Alexander 1833) shows no habitation closer than the western edge of Waiawa in the vicinity of Papakolea Point. A Moomau survey map of 1878 documents substantial settlement in the "Honoluli Pali Lands" of the Papakolea Point area and it seems clear that in early historic times this was the focus of the population of Honoluli.

The unbroken area - including submarine, new land, and salt pans - would have focused population there in prehistoric times as well.

The Organ Act of 1843 and 1848 initiated the process of the māhina - the division of Hawaiian lands - which introduced private property into Hawaiian society. In 1844 the crown and the alii (nepalii) received their lands. The common people received their kahuna (individual parcel) in 1840. At that time, the alii's of Honoluli (2320 acres) was granted to the ali'i Mī'īn Mākeke Kekuakawili (Royal Patent 6071, Land Commission Award 11726, Apana 3, Land Commission Awards (LCAs) for Kahuna to commoners in Honoluli appear to have been located at Papakolea Point. No LCAs were recorded within any portion of the present study area.

In 1871, Ke'alohi Kekuakawili rented much of Honoluli to James Dower and John Meck for stock grazing (Kuahale 1973:12). When James Campbell paid $55,000 for most of Honoluli in 1877 he drove off the land and 32,207 head of stock belonging to Dower, North and James Robinson (S Kim 1871:13). A 1886 photograph of James Campbell's residence in Honoluli shows the open, sparsely vegetated plain of Ewa, likely an effect of the years of cattle grazing across the plain (Figure 2).
Until 1890 most of Campbell's lands in Honolulu were used exclusively for cattle ranching. At that time, one planter remarked "the country was so dry and full of bottomless cracks and fissures that water would all be lost and migration unsatisfactory." (Ewa Plantation Co. 1923:6-7)

But the capital of entrepreneurs like James Campbell, Benjamin Dillingham and W.R. Castle, along with the rapid development of sugar water, led to the creation of Ewa Plantation which was incorporated in 1880.

The first crop, 2,249 tons of sugar, was harvested in 1892. Ewa was the first all-American plantation and, in spite of early troubles, it gave an impressive demonstration of the past srivit's ability to play a significant role in the Hawaiian sugar industry. (Bayliss 1983:186)

Contemporaneously with the establishment and growth of the Ewa Plantation was the development of the Oahu Railway and Land (O.R.L.) Company, organized by Benjamin Dillingham in 1889, which connected outlying areas of O'ahu to Honolulu. During the last decade of the 19th century, the railroad would reach from Honolulu to Pearl City in 1898, to Waianae in 1899, to Wahiawa Plantation in 1899, and to Kahuku in 1899 (Bayliss 1983:186).

During the 20th century, the Ewa Plantation would continue to grow and, by the 1930s, would encompass most of the eastern half of the Honolulu district (Figure 3). This growth supplied the creation of plantation villages to house the growing immigrant labor force working the fields. In the decade of the 1920s, the plantation built 22 houses, cottages or dormitories; in the first decade of this century, 56 in the second decade, 137, in the 1920s, 285; in the 1930s, 335; and in the 1940s, only 33. (Kee 1930; 1933:186)

By the outbreak of World War II, which sparked off much of the plantation's manpower, along with the changeover to almost complete reliance on mechanical harvesting in 1938, there was little need for the large multi-racial plantation Chinese, Filipinos, Korean, Portuguese, Spanish, Hawaiian, Filipino, European labor force that had characterized most of the early history of the plantation.

During the subsequent decades of the 20th century, sugar cane operations at Ewa Plantation were phased out and, more recently, former cane fields have been removed for residential development. Structures in the area of the former plantation village have fallen into disrepair or have been demolished. However, portions of the area—i.e., including Olomana Village, Tennyson Village and Ramon Village—have been designated the "Ewa Village Historic District" (Map 3-1) which has been nominated for National Historic Landmark status. Additionally, the still-extant O.R.L. rail line through Honolulu has been placed on the National Register of Historic Places (Map 3-1). (Kee 1930:186)

An aerial photograph of the 1940s indicates that, by the last decades of the 20th century, the present project area is a portion of an "Ewa landscape that has been fully developed by commercial agriculture and urban expansion. (Figure 4)"
IV. ARCHAEOLOGICAL RESEARCH IN THE VICINITY OF THE PROJECT AREA

During a 1930 survey of Oahu for the B.P. Bishop Museum, J. Gilbert McAllister identified Site 146 in Honolulu area.

Ewa total plums, throughout which are remains of many stones. The great expanse of old stone walls, particularly near the Pan-Po-To Salt Works, belongs to the farming period of about 75 years ago. It is probable that the holes and pits in the wall were formerly used by the Hawaiians. Frequently the soil on the floor of the larger pits was used for cultivation, and even today, one comes upon bones and Hawaiian sugar cane still growing in them. They served both for protection and as a shelter for the time of Cook, there was no large population here (McAllister 1939).

McAllister’s survey map places Site 146 in the general vicinity of the present study area, but the type site is present on Oahu more than 3 kilometers to the southeast of the study area. The only other early documented site within the vicinity of the center was a house on Niihau, located more than 3 kilometers to the west.

Beginning in the 1980s, archaeological research has been conducted in Honolulu in the general vicinity of the present study area. An archaeological reconnaissance survey (Honolulu 1983) was conducted in association with the development of the 233-acre "West Loch Estates" residential development I and II projects, part of which lies to the east of the present study area. An archaeological reconnaissance (Kennedy 1988) and subsequent archaeological subsurface survey (Davis 1988) were conducted in association with the development of the 190-acre "Ewa Gentry" project area which lies immediately to the east of the south portion of the present study area.

The combined surface and subsurface reconnaissance survey of the "West Loch Estates" project area confirmed an initial impression that the project area had been extensively and almost entirely modified by decades of commercial sugarcane cultivation (Honolulu 1983). This study identified a mound cemetery, two historic sites of minimal integrity, and an unexcavated deposit. One of the historic sites retrieved (T-3) was related to the plantation settlement of Lower Village. It was noted that some artifacts "indicate the possibility of pre-1949 occupation" (Davis 1988).

In the "Ewa Gentry" project area the initial reconnaissance (Kennedy 1988) found no surface evidence of potentially significant cultural-historic resources. A subsequent subsurface exploration was undertaken. Eighteen backhoe trenches were excavated however "no evidence of in situ cultural activity was found anywhere in the Ewa Gentry project area" (Davis 1988:10).

In 1990, Cultural Surveys Hawaii conducted an archaeological reconnaissance survey of an approximately 654-acre area which included "three extant plantation villages (Ko'olau Village, Tenny Village and Wainiha Village), the sites of three former plantation villages (K Village, Mill Village, Middle Village) and several other sites associated with the Ewa Plantation Infrastructure." (Hummer et al.1990a). The survey found no evidence of any prehistoric activity within the project area and recommended further documentation of some of the extant plantation structure sites.
V. FIELD INSPECTION FINDINGS

Field investigation of the project area corridor was conducted on April 1, 2004 (Figures 5 & 6). The corridor was also previously investigated by Cultural Surveys Hawaii in June 1996. Virtually the entire corridor comprises land formerly under cultivation of sugar cane which commenced in the late 19th century. Since the cessation of cane production, portions of the corridor have undergone varied levels and types of development.

Immediately south of Kalani Road and beyond the former plantation village, the corridor continues west, following for approximately 1500 meters - the route of an asphalt-paved road that appears to have been constructed in conjunction with the Ewa Village Golf Course along the east side of the corridor. The corridor on both sides of the road is elevated and cleared, and no archaeological evidence was observed.

At the north corner of the parcel, the corridor curves northward to Farrington Highway through now-side-cane fields, the route demarcated by an alignment of electricity lines. This portion was surveyed on foot. No properties related to traditional Hawaiian culture were observed anywhere near the corridor. Two plantation-era structures, however, were observed. A ditch (following alongside plantation roads) borders the corridor 1300 meters north of Farrington Highway. The ditch is approximately 2 meters (6.6 ft) wide and 1.5 meters (4.9 ft) deep, and is constructed of cut stone with a mortar casing. It is in good condition within the corridor and continues for considerable distances to the east and west of the corridor. Approximately 800 meters north of Farrington Highway, a flume remnant was observed on the west side of the corridor. The flume consists of half-round steel pipe supported by a brick and wood framework and is raised approximately 15 m (50 ft) above the ground surface. The flume remnant has been exposed and other discontinuous remnants of the flume were observed continuing west beyond the corridor.

Marked by Farrington Highway, the corridor follows the route of Pāhia Road over the H-1 Freeway. Two shallow gulches cutting through the corridor - Hahine Gulch to the west of Pāhia Road and Kahi’s Gulch to the east - were inspected on foot. The northeast third of the parcel at the end of the corridor, on both sides of the H-1 Freeway, comprises land that is currently being cultivated (non-sugar crops). The remainder of the open land within the corridor on both sides of the H-1 Freeway, which was inspected on foot, shows evidence of former sugar cultivation. Wrecks remnants of a flume alignment were observed on both sides of Pāhia Road just north of the H-1 Freeway. No properties related to traditional Hawaiian cultural practices were observed in this portion of the corridor.
VI. RESULTS OF COMMUNITY CONTACT PROCESS

Throughout the course of this assessment, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge and/or concerns about traditional cultural resources, practices and beliefs specifically related to the Northern Leg of the Western Hawaiian Road project area. This effort was made by letter, e-mail, telephone or in-person contact. In the majority of cases, letters—along with a map and aerial photograph of the project area—were mailed with the following text:

At the request of Pasco Birchfield-Quade & Douglas, Inc., Cultural Surveys Hawaii has undertaken a cultural impact evaluation of an approximately 13,000 ft. (4.6 kilometers) long land corridor in the Upolu area of Honolulu in the Ewa District of Oahu. The corridor is proposed for a north-south oriented roadway connecting the market portion of Ewa to the H-1 Freeway. The corridor extends on both sides of the corridor commences at Beres Road between Vaena Village and Tennyson Village. As it runs north and northeast, the corridor incorporates a portion of the future development of Kapolei Parkway. June 2001 marks the present Kapolei Parkway; the corridor runs north, traversing former sugar cane fields, then paralleling and crossing Pali Highway over Farrington Highway, and terminating at the H-1 Freeway. This portion of the cultural evaluation is to evaluate potential impacts of the project to traditional cultural practices.

We are seeking your input regarding the following issues:

- Identification of traditional Hawaiian activities including gathering of native plants, insects and other resources.
- Identification of existing archaeological or cultural sites, trails, burials, etc., which may be impacted by the proposed study.
- Cultural associations within the study area through legends, traditional use or otherwise.

Attempts were made to contact fourteen individuals, cultural organizations and government agencies (see Table 1 below). The organizations and agencies include: the Office of Hawaiian Affairs, the Bureau of Hawaii's State Historic Preservation Division, Hawaii Civic Clubs, and the Culture and History Branch of the State Historic Preservation Division. The table below presents the responses and comments received.

### Table 1: Community Contacts

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<tr>
<th>Name</th>
<th>Organization, Affiliation</th>
<th>Comments</th>
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<tr>
<td>Gabbed, Mike</td>
<td>Connectoes District 1, Honolulu City Council</td>
<td></td>
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<tr>
<td>Kalikau, George Jr.</td>
<td>Chair, Hawaiian Civic Club of Pahewa and Ewa</td>
<td></td>
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<tr>
<td>Kanoa, Shad</td>
<td>Ahahui Smale Hawaii Civic Club</td>
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<tr>
<td>Kanoa, Brian</td>
<td>Senate District 1, Hawaii State Legislature</td>
<td>No reply.</td>
</tr>
<tr>
<td>Kapoleka, Kana'i</td>
<td>Hawaii Historic Preservation Division</td>
<td></td>
</tr>
<tr>
<td>Kenuki, Eric</td>
<td>Historic Sites Inventory Coordinator, State Historic Preservation Division</td>
<td>Referred to reports at State Historic Preservation Division.</td>
</tr>
<tr>
<td>Luchensko, Tom</td>
<td>District Superintendent</td>
<td>No reply.</td>
</tr>
<tr>
<td>Mitchell, Kana</td>
<td>Hawaii Historical Preservation Division</td>
<td></td>
</tr>
<tr>
<td>Nepo, Robert</td>
<td>Hawaii and Cultural Branch Chief, State Historic Preservation Division</td>
<td>Referred to Shad Kano.</td>
</tr>
<tr>
<td>Tiffany, Neima</td>
<td>Oahu Island District 1, Hawaii State Legislature</td>
<td>She is most familiar with the area Koloa near the sea.</td>
</tr>
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</table>

<table>
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<th>Name</th>
<th>Organization, Affiliation</th>
<th>Comments</th>
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<tr>
<td>Aly, Williams</td>
<td>Ulani Mauhi Chairperson</td>
<td>Referred to Shad Kano</td>
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<tr>
<td>Collier, Sara</td>
<td>Archaeology Branch Chief, State Historic Preservation Division</td>
<td>Referred to reports at State Historic Preservation Division</td>
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<tr>
<td>Guth, Heidi</td>
<td>Native Rights Policy Analyst, Office of Hawaiian Affairs</td>
<td>No reply.</td>
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<tr>
<td>Espino, Wilton</td>
<td>Senate District 28, Hawaii State Legislature</td>
<td>No reply.</td>
</tr>
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VII. TRADITIONAL CULTURAL PRACTICES

Traditional cultural practices are based on profound awareness concerning harmony between man and their natural resources. The Hawaiians of old depended on these cultural practices for survival. Based on their familiarity with specific plants and through much trial and error, Hawaiians communities were able to devise systems that favor sustainable use of nature’s resources. Many of these cultural practices have been passed down from generation to generation and are still practiced in some of Hawai’i’s communities today.

This project seeks to assess traditional cultural practices as well as resources pertaining to the project area within Honolua Alaka‘i. This section will survey the different types of traditional practices, cultural resources associated with the vicinity. Exepts from interviews are incorporated in sections where applicable.

A. Gathering for Plant Resources

Upland resources were utilized by Hawaiians for a multitude of purposes. Forest resources were gathered, not only for the basic needs of food and clothing, but for tools, weapons, canoe-building, house construction, dyes, adornment, hula, medicinal and religious purposes. Within the project area there is no specific documentation was found in regards to gathering of plants during traditional Hawaiian times. Despite this assessment there were no ongoing practices related to traditional gathering rights identified in the proposed project area. None of the individuals contacted or interviewed for this assessment identified any native gathering practices within the project area.

B. Marine Resources

The sea is a rich resource and the Hawaiian people were traditionally expert fishermen. Fish of all types supplied the Hawaiian diet with a rich source of protein. Today many people continue to fish along the coastline south of the project area.

C. Traditional Hawaiian Sites

During this assessment there were no traditional Hawaiian sites identified within the proposed project area.

D. Burials

No specific documentation was found regarding ‘i‘iwi (ancient remains) in the project area. None of the people contacted mentioned any burials that would be affected by the proposed project.

E. Trails

Trails served to connect the various settlements throughout the District of ‘Ewa. Based on nineteenth and twentieth century maps, the primary transportation routes maintained today to the existing major roads.
Summary of Findings

VIII. SUMMARY OF FINDINGS

Hoomaluhia, as a unit, contains all the geographic elements of a typical Hawaiian valley ala'apai, except they are arranged geographically in an atypical relationship. The ala'apai is not organized around a single drainage network but shares the upper portions of Waikoloa drainage in its upper reaches. A highly advantageous characteristic for human subsistence is included in a vast expanse of sleeping forest land.

The central locale within the ala'apai of Hoomaluhia in terms of population, as well as cultivated foods, was the 'Iliahu. There is good reason to assume, given the lack of intensive agricultural resources in other locations during prehistoric times, that all other habitation zones were economically and socially co-dependent.

The present project area – located in the bowl, dry inland plain of central Hoomaluhia – was well outside the traditional centers of permanent habitation within the ala'apai. The only preserved Hawaiian place name associated with any feature in the immediate vicinity of the project area is Kaha's Gulch, which courses through portions of the project area. An indication that this portion of Hoomaluhia was not unknown to traditional Hawaiian times are stories concerning "Wahina" or "Pua'ulaulani", a hidden spring associated with Kaha's Gulch.

Another feature of the landscape was the traditional Hawaiian trail through Hoomaluhia going from Pua'aka to Pu'u Kapoho and Waimanalo (Fʻa'eo) (FH 1983:97). It seems most likely that this trail followed the route of the present Farrington Highway across the present project area. However, no recent traces of this trail have been documented in modern times.

Given the environmental constraints within this portion of the ala'apai, it is likely that the major traditional cultural practice associated with the region including the present project area would have been the gathering of native plant resources. Barbara Frieman (1973) has compiled a list of native plant species present in Hoomaluhia before 1785. Plants present in the ala'apai's bowllands, where the present project area is located, include:

<table>
<thead>
<tr>
<th>Common/Hawaiian Name</th>
<th>Scientific Name</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kula, pandanus</td>
<td>Pandanus tectorius</td>
<td>Weaving</td>
</tr>
<tr>
<td>Hon, hibiscus</td>
<td>Hibiscus tilius</td>
<td>Cordage</td>
</tr>
<tr>
<td>Maha</td>
<td>Tepeta paniheko</td>
<td>Wood used for bowls</td>
</tr>
<tr>
<td>Semat, needlesea</td>
<td>Rhus sandwicensis</td>
<td>Rhus chinensis</td>
</tr>
<tr>
<td>Ulu</td>
<td>Sida renifolia</td>
<td>Leis, medicine</td>
</tr>
<tr>
<td>Kula</td>
<td>Cappa tabescens</td>
<td>Bowls</td>
</tr>
</tbody>
</table>

The accessibility of Hoomaluhia lands, including the present project area, to the Hawaiian for gathering or other cultural purposes would be radically curtailed during the second half of the nineteenth century. As noted above in this evaluation, by the 1870s, large areas of Hoomaluhia were cultivated for sugarcane. The landscape of the area was dominated by the introduction and rapid development of commercial sugarcane cultivation. Throughout the twentieth century sugarcane cultivation was the dominant land use activity within the project area. Cane cultivation – and the space that the project area was privatized – restricted access inside the project area to employees of Waihu Plantation.

On the evidence gathered for this evaluation, at present no contemporary or continuing cultural practices occur within the project area specifically.

Based on the above findings, the North South Road and Kapoho Parkway Project will have minimal direct impact upon native Hawaiian cultural resources, beliefs and practices.
IX. REFERENCES


David, Benelli D. and Allen E. Han 1987 Intensive Archeological Survey and Test Excavations West Beach Data Recovery Program, Honolulu, Ewa, Island of Oahu, FHRI Inc.


Hennant, Halbert H. and Rodney Chingjoji 1990 Archaeological Reconnaissance Survey of a 79,000 Ft. Long Corridor Within Honolulu Bais'a, 'Ewa District, Oahu Island Cultural Surveys Hawaii, Kailua, Ill.

Hennant, Halbert H. and William B. Farr 1983 Archaeological and Paleontological Investigation at Kahelua (Barber's Point), Honolulu, 'Ewa, Oahu, Federal Study Area 1a and 1b, and State of Hawaii's Cultural Survey Area 1A, ACH 14-115.

APPENDIX N

SECONDARY AND CUMULATIVE IMPACTS REPORT
NORTH-SOUTH ROAD AND KAPOLEI PARKWAY PROJECT

Cumulative and Secondary Impacts Report

Prepared by:
PARSONS BRINCKERHOFF GUIDE & DOUGLAS, INC.

July 2004

CUMULATIVE AND SECONDARY IMPACTS

1.0 INTRODUCTION

According to the Federal Highway Administration's (FHWA) "Position Paper on Secondary and Cumulative Impact Assessment" (August 20, 1992), the 1978 regulations of the Council on Environmental Quality (CEQ) implementing the National Environmental Policy Act (NEPA) require agencies to examine indirect consequences of proposed federal actions and programs. These consequences may occur in years beyond the immediate influence of a proposed action and at some time in the future. The CEQ prepared a handbook entitled "Considering Cumulative Effects Under the National Environmental Policy Act" (January 1997), in which they refer to these consequences as secondary and cumulative impacts. CEQ guidelines for implementing NEPA broadly define both cumulative and secondary impacts.

Cumulative effects are impacts which result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions (40 Code of Federal Regulations (CFR) 1508.7). These impacts are thus defined as secondary effects. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Secondary effects are those that are "caused by an action and are seen in time or further removed in distance but are still reasonably foreseeable" (40 CFR 1508.8).

Generally, these impacts are induced by the initial action. They comprise a wide variety of secondary effects, such as changes in land use, water quality, economics, visibility, and population density. Effects and impacts as used in these regulations are synonymous.

This cumulative and secondary effects analysis uses the best information currently available to assess the extent to which the proposed North South Road and Kapolei Parkway project interacts with reasonably foreseeable past, present and future projects in the area to cause potential impacts above and beyond the direct impacts of the project alone. Section 2.0 addresses potential cumulative impacts, and Section 3.0 addresses secondary impacts.

2.0 CUMULATIVE IMPACTS

The purpose of cumulative effects analysis is to ensure that federal agencies consider the full range of consequences of actions related to project activities. NEPA, the CEQ regulations, and Hawaii's Environmental Impact Statement Law (HRS Revised Statutes Chapter 343 [HRS 343]), require analysis of cumulative issues within the context of the action, alternatives, and effects. The context of cumulative analysis...
includes resources, ecosystems, and human communities considered over a meaningful geographic area and through time (past, present, and future).

The cumulative impact analysis consists of evaluating impacts related to projects that are reasonably foreseeable and would be constructed or operated during the life of the proposed project. The time frame for the cumulative analysis is the 20-year design life of the proposed project after construction. The 20-year time frame was selected because this is the maximum period of time that a given transportation facility remains effective and has a continuing influence on the transportation system.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and infrastructure development. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, and disruption of movement and migration corridors. Cumulative impacts include increased demand for public services and infrastructure, such as water supply and sewage treatment, schools, recreation facilities, and roadways, as well as increased adverse effects on noise levels, air quality, water quality and the permanent loss of agricultural land. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability and employment.

2.1 METHODOLOGY

A detailed methodology was prepared for analyzing cumulative impacts, as well as secondary impacts, in the Secondary and Cumulative Effects Analysis Guidance (Parsons Brinckerhoff, 2001).

The geographic area encompassed by the cumulative impacts analysis is the Ewa Plan area shown in Figure 1. This geographic area was determined by considering the existing natural, physical, environmental, and socioeconomic conditions of the area, and examination of the existing and planned development projects in the Ewa Plan that would potentially arise or be affected by the proposed North-South Road and Kapolei Parkway. The geographic boundaries encompassed by this cumulative impacts analysis include lands in the vicinity of the North-South Road and Kapolei Parkway project, from the Transient Route H-1 (I-1 Freeway) north to the Pacific Ocean, and from Pali Road west to Farrington Highway. The existing and planned projects within the area were assessed as part of the baseline existing conditions for this cumulative impacts analysis.

As stated above, the cumulative impacts analysis consists of past, present, and reasonably foreseeable future projects in the area that collectively have the potential to cause adverse effects. Past projects are assumed to be part of the existing environment, and are therefore not considered separately. Therefore, the types of projects considered in this report are existing projects and planned projects, as well as projects similar in nature to the proposed action i.e. transportation projects. While the proposed project is being designed to minimize impacts and take into account
North-South Road and Kapolei Parkway
Cumulative and Secondary Impacts Report

It has been noted that the Ewa DP includes the continuation of the North-South Road and completion of Kapolei Parkway as integral components of the plan. The roads are shown in figures of the Ewa DP, including the Open Space Map, the Urban Land Use Map, and the Planning Map.

The remainder of the cumulative impacts analysis identifies existing and planned development projects in Section 2.3. Consulting these existing and planned projects, Section 2.4 provides an overall assessment of each of the following environmental and social dimensions:

- Land Use
- Geology, Soil, and Fauna
- Infrastructure
- Social, Cultural, and Economic Conditions
- Air Quality
- Water
- Ecosystems
- Water Resources
- Hazardous Materials
- Historic Resources
- Parks and Recreation
- Visual & Aesthetic Resources

2.2 REGIONAL PLANNING EFFORTS

Substantial residential growth will occur primarily in master planned communities in the Ewa Plan. At present, 28,000 new residential units are anticipated by 2020, including the City of Kapolei, Ewa by Gentry, Ocean Pointe, Ewa Villages, Ko Olina, Lualualei, Mahalu

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North-South Road and Kapolei Parkway
Cumulative and Secondary Impacts Report

11/10, Mahalo, the Villages of Kapolei, and an area some refer to as East Kapolei. The Ewa DP calls for these communities to be designed to meet a wide range of housing needs, including affordable units, starter homes, large multi-family and single family units, as well as housing for students going to school at the University of Hawaii-West Oahu Campus (UH-WO).

A key element of the vision put forth in the Ewa DP is the creation of the Secondary Urban Center, which will provide a wide range of retail, service and activity centers in Ho Olona and Ocean Pointe. The Secondary Urban Center will be located in Kapolei, and will provide a mix of residential and community and neighborhood centers. The Ewa DP anticipates that the growth will be substantial as housing growth, increasing from 15,000 units in 2000 to more than 65,000 units by 2020.

Population and economic projections to the year 2025 prepared by the State of Hawaii Department of Business, Economic Development and Tourism (DBEDT) indicate that the population of Honolulu County in 2000 was approximately 1,072,900 and is projected to reach approximately 1,099,400 in 2005, and approximately 1,229,600 in 2015, an increase of approximately 15 percent and 18 percent respectively. During the same periods, total civilian jobs in Honolulu County are expected to increase from approximately 567,900 in 2000 to 610,300 in 2005 and to 634,700 in 2015, reflecting increases of approximately 20 percent and 27 percent, respectively. (Hawaii 2025 Series, February 2000)

2.3 PROJECTS CONSIDERED FOR CUMULATIVE ANALYSIS

The local environment, particularly in areas near the project site, includes existing and planned residential, commercial, industrial, and industrial development. A large portion of the area surrounding the proposed project site consists of former sugar cane plantation land. Historic 1927 United States Geological Survey (USGS) aerial photographs were examined and confirmed that the Ewa Plan was primarily in agricultural use until the 1930s.

The following criteria were considered in identifying past, present, and reasonably foreseeable future projects that could result in cumulative impacts to the Ewa Plan's resources:

1. Projects that are similar in nature, could affect similar resources, or are located in close geographic proximity to the proposed project (Section 2.3.1)
2. Past projects that have been constructed and are part of the baseline, existing conditions. These projects may be expanding, and may have the potential to generate additional cumulative impacts (Section 2.3.2)
3. Projects that are proposed for development that are designed and are expected to be implemented (Section 2.3.3)
North-South Road and Kapolei Parkway
Cumulative and Secondary Impacts Report

These projects include housing, commercial, and industrial developments, infrastructure projects, and new schools, including UH-West Oahu.

Specifically, the cumulative effects analysis includes the following projects, which are shown on Figure 1.

2.3.1 Projects Similar in Nature

The following transportation projects are planned for the Ewa Plain:

- Widening Ford West—Wai‘alu Road, from 4 lanes to 6 lanes
- Widening Ford Ewa-Road, from 2 lanes to 4 lanes
- Widening Farrington Highway, from 2 lanes to 4 lanes
- Completing Kapolei Parkway missing segments, and extending it west to Ka‘ula
- Includes constructing the segment between H-1 and the existing NP
- Extending Pa‘ikale Boulevard west into City of Kapolei
- Adding ramps at H-1 Freeway/Mapikana Interchange, oriented towards Waimanalo
- Adding new Kapolei interchange between Mapikana and Pa‘ikale Interchange
- Extending Pa‘ikale Road segment, between North Shore Road interchange and Mapikana Drive
- Adding H-1 Freeway HOV lanes, increasing total lanes in H-1 Freeway from 6 to 8 lanes
- Regional Bus Rapid Transit (RRT) ontransit projects

2.3.2 Existing Projects

2.3.2.1 Ewa Villages

Ewa Villages is the oldest community in the Ewa region, as discussed in Section 3.1.1. At one time there were eight villages housing immigrant plantation workers. Now only Rewa, Tonina, Varena, and Mapikana Villages remain. Rewa and Tonina Villages were redeveloped by the City and County of Honolulu (City) in the late 1970s and early 1980s, and Tonina Village was redeveloped in the 1980s for affordable housing. Ewa Villages also includes district and neighborhood parks, a municipal golf course as well as other golf courses, and a small commercial area. The Ewa Plantation Villages was placed on the Hawaii State of Historic Places in 1990.

Ewa Villages has an approximate land area of one square mile, and had a 2000 population of 4,741 people and 1,474 housing units, approximately 79 percent of which were owner-occupied. Three logistics were a 25 percent increase above the 1990 population of 3,780 and a 36 percent increase above the 839 housing units in 1950. Of industries providing employment for Ewa Villages, 16.7 percent were in retail trade, 16.7 percent were in educational, health and social services, 10.7 percent were in arts, entertainment, recreation, accommodation and food services, and 11.5 percent were in retail trade. The mean travel time to work was 35.6 minutes (www.city-data.com, accessed April 2004).

The Ewa DP estimates that there will be approximately 1,585 housing units in Ewa Villages in 2020, consisting of affordable and market price housing, including 200 units of rehabilitated housing.

According to the Oahu Metropolitan Planning Organization’s (OMPO) Forecasted Land Use Model Population and Employment Comparison for Years 2000 and 2025 (OMPO’s Land Use Model) population for "Ewa & Ewa Beach" (see Section 2.3.2.2 Ewa Beach below) is expected to increase by 16 percent, the number of housing units is expected to increase by 182 percent, and total employment is expected to increase by 30 percent during that period.

2.3.2.2 Ewa Beach

Ewa Beach, an existing urban area, has a land area of 1.4 square miles, and had a 2000 population of 14,600 people and 3,715 housing units, of which approximately 60 percent were owner-occupied. This was a 2.3 percent increase above the 1990 population of 14,315 people and a 2.6 percent increase above the 1990 number of 3,626 housing units. Of industries providing employment for Ewa Beach, 17.5 percent were in educational, health and social services, 17.5 percent were in arts, entertainment, recreation, accommodation and food services, and 13.6 percent were in retail trade. The mean travel time to work was 39.9 minutes (www.city-data.com).

From the population data it is apparent that there has been little change in Ewa Beach in the past decade or so. Early additional growth was anticipated in Ewa Beach, according to Table 2 of Planning of Ewa Development in the Ewa DP.

2.3.3 Ewa by Gentry

Ewa Gentry has a land area of 0.3 square mile, and had a 2000 population of 4,039 people, with 1,913 housing units, of which approximately 60 percent were owner-occupied. This was a 14.8 percent increase above the 1990 population of 3,502 people and a 15 percent increase above the 1990 number of 752 housing units. Of industries providing employment for Ewa by Gentry, 18.0 percent were in educational, health and social services, 15.5 percent were in arts, entertainment, recreation, accommodation and food services, 24.4 percent were in public administration, and 10.5 percent were in retail trade. The mean travel time to work was 36.6 minutes (www.city-data.com, accessed April 2004).

The Ewa DP notes that 7,078 housing units are anticipated in Ewa by Gentry by the year 2020.

2.3.3.4 Mokapu

Mokapu, a suburban community started in the early 1960s, has a land area of 2.1 square miles, and had a 2000 population of 13,156 people, with 4,119 housing units. (single-
family homes and townhouses of which approximately 70 percent were owner-occupied. This was a 34 percent increase above the 1990 population of 9,828 people and a 25 percent increase above the 1990 number of 3,000 housing units. Of industries providing employment for Kapolei, 10 percent were in education, health and social services; 12 percent were in public administration; and 13 percent were in retail trade. The mean travel time to work was 33.3 minutes (www.cdc.gov, accessed April 2004).

According to the CAMPO Land Use Model data comparisons between Year 2000 and Year 2025, population is expected to increase by 20 percent, the number of housing units is expected to increase by 43 percent, and total employment is expected to increase by 45 percent during that period.

2.3.3.5 Villages of Kapolei

The Villages of Kapolei consist of eight privately developed residential villages, three schools (elementary, intermediate, and high school), a senior housing center, an 18-hole golf course, neighborhood parks and two recreation centers. The first homes for the Villages of Kapolei were completed in 1998. All of the villages have been built with techniques planned for future development. Some of the units are designated as "affordable" below market price to allow buyers who would not otherwise be able to own a market-priced home. Like the City of Kapolei, the Villages of Kapolei are a vital component of Oahu's Secondary Urban Center.

According to the CAMPO Land Use Model data, the Villages of Kapolei had a 2000 population of 3,301 people, and are projected to increase by approximately 103 percent to a total population of 6,714 for 2025. Housing units in Villages of Kapolei in 2000 were estimated at 888, and CAMPO projects a total of 2,927 housing units by 2025, an increase of 209 percent. CAMPO projects the largest growth to be in total employment, rising from 33 in 2000 to total employment of 7,756 in 2025, an increase of 50 percent.

2.3.3.6 West Loch Estates and West Loch Fairways

West Loch Estates, developed by the City's Department of Housing and Community Development, is located on the shores of Pearl Harbor's West Loch. The master plan envisioned a mix of single-family residential units, housing for seniors, a convenience commercial area, day care center, district park, elementary school, park and ride facility, municipal golf course, and a sheeple park. Fifty percent of all the housing units were to be affordable housing. Phase I of the project included 600 single-family homes on approximately 4,000 square foot lots.

Another West Loch master planned neighborhood is the West Loch Fairways project, which also includes affordable housing. West Loch Fairways includes 700 single-family homes and 120 townhouses. Some of the homes border the public West Loch Golf Course. The project was built in the 1990s by the City and County of Honolulu Department of Housing and Community Development, primarily as an affordable housing project. However, now all homes are market value. 120 townhomes are being built.

2.3.3.7 James Campbell Industrial Park

The James Campbell Industrial Park is Oahu's largest industrial park (1,137 acres) and Kapolei's largest job center, accounting for more than 230,000 jobs. The park is strategically located next to Honolulu/Pearl Harbor, the state's second largest commercial harbor. The park has Foreign Trade Zone status and Enterprise Trade Zone status. Its companies represent the following industries: manufacturing, recycling, apparel/food, power generation, construction, wholesale and distribution.

According to the CAMPO's Land Use Model, James Campbell Industrial Park had a 2000 population of 38, which is projected to rise to 9,934 by the year 2025, a significant increase of 9.3 percent. The number of housing units is projected to rise nearly 1,500 percent from 3 in 2000 to 1,601 in 2025, and the total employment is projected to increase from 2,016 in 2000 to 11,923 in 2025, an increase of approximately 500 percent.

2.3.3.8 Kalakaua (formerly Barbers Point Naval Air Station)

In October 1995 the U.S. Navy published a Notice of Scrutiny Determination, indicating that 2,147 acres and 156 facilties were available for consideration for the Barbers Point Naval Air Station (Barbers Point NAF) Community Redevelopment Plan. As the plan evolved, the Navy removed 48 acres from the Scrutiny Determination list to the U.S. Coast Guard. The majority of the former Barbers Point NAS lands were made available to various State and City and County agencies through public benefit conveyances (EBFD website). The area is now the Kalakaua Community Development District.

The City of Honolulu Board of Water Supply proposes to build a 100,000 acre-foot per year desalination facility on Kalakaua. The proposed desalination facility will produce 5 million gallons per day (MGD) of freshwater that will add to Honolulu's potable water supply. The desalination facility will occupy a portion of a 20-acre parcel. An electrical intertie line will be constructed on an adjacent one-acre parcel of the proposed desalination facility. This intertie will provide a dedicated source of power to the desalination plant. Source water for the desalination will be provided through a network of three eight-inch wells located on the 20 acre parcel.

CAMPO Land Use Model indicates that the year 2000 Kalakaua had a total population of 4,609, which is projected to increase to 2,016 in 2025 and a decline of approximately 7 percent housing units, according to the US Census.

Kapolei Business Park

The Kapolei Business Park, which opened in 1994, is located next to James Campbell Industrial Park and Hauula Harbor. The infrastructure and landscaping for the first 135 acres of this 250-acre project have been completed. The park has an advanced telecommunications infrastructure as well as access to both regional and Asian and U.S. domestic carriers. The park is attracting companies ranging from light industrial, processing, suppliers, wholesalers, warehouses and distribution companies to data processing, high tech research and development, integrated systems networks, retail exchanges, data centers, and switching stations for telecom companies.

A private California investment firm (Lansing Holdings LLC) has recently agreed to buy all the undeveloped property at Kapolei Business Park, approximately 91 acres, from Kapolei master developer Campbell Estate. Presently the park has seven tenants on 18 acres, including Cardinal Health, a Hoffman Marus warehouse, a Palama Meat processing plant, two churches, and a city fire station (The Honolulu Advertiser, April 6, 2004).

City of Kapolei

The City of Kapolei, which is West Oahu's Secondary Urban Center, is an urban mix of commercial, office, and residential uses. In 2000, acres are planned for 6 million square feet of civic-commercial and 12,000 hotel units, as a satellite city to be complementary to Honolulu (www.parsons.com/2001/10/website/landing/kapolei, accessed April 2004).

According to the UIOP Land Use Model, the City of Kapolei had a 2000 population of 6,545 people, which is projected to increase to 25,724 by 2025, an increase of 437 percent. Similarly, the UIOP estimated number of housing units in 2000 was 175, and is projected to increase by 492 to 1,030 housing units in 2025, while the total employment is to increase by approximately 817 percent, from 1,029 in 2000 to a projected 8,170 total employment in 2025. This reflects the anticipated growth of the City of Kapolei in the heart of the Secondary Urban Center.

The Ewa DP projects that by 2030 the City of Kapolei will have more than 7,000 residents and provide work sites for 25,000 prime jobs and 2,000 City and State jobs, to be located at the City Civic Center, which is a regional commercial center.

Honolulu

Honolulu is an older residential community east of and along Old Pokai Bay Road, which is a fairly well developed commercial center.

Department of Hawaiian Home Lands

In November 2002, the State of Hawaii and the Department of Hawaiian Home Lands (DHHL) signed a historic agreement to transfer a tract of 1,298 acres, including the proposed new city of Kapolei, to the State. The next step is to begin the process of transferring the lands to the DHHL. The two parcels are to the west of the proposed North South Road and at the

reservoir holding water diverted from the Wai`anae side of the island (PacifiCity Business News, April 2003).

Ko Olina

The Ko Olina project includes the Ko Olina Resort & Marina, a 650-acre major resort approved for hotel in 1994, Marquis’s Plantation & Spa, time-share, commercial, recreational development, including golf courses and a 43-acre marina with 710 full service slips, and private luxury residences.

Letters of intent were signed by hotel conglomerates Hyatt, Marriott and others, stating they would construct additional 250-room and 310-room hotels, respectively. Officials intend to follow suit, such as Hilton, with a 400-room hotel and 250-unit timeshare project, and InterContinental Corp., with a 300-unit village.

Center Elle Snow Properties also plans to build 60 single-family homes and 250 townhouses on 10 acres at Ko Olina (Pacific Business News, May 29 and October 16, 2003).

According to the UIOP’s Land Use Model, Ko Olina had a population of 2,450 in 2000, which is projected to increase to 8,701 by 2025, an increase of 255 percent. The number of housing units is expected to increase from 581 in 2000 to 2,207 units in 2025, or approximately 300 percent. Total employment is projected to increase 596 percent from 3,516 in 2000 to 11,432 in 2025.

According to the developer, Jeff Stone, the Ko Olina project is anticipated to take 10 years, cost $715 million, create 18,800 construction jobs and 2,900 permanent jobs, and generate $166 million in tax revenue (PacifiCity Business News, February 28, 2003).

Ocean Pointe

In 1993, Honolulu Hawaiian, Inc. purchased the 1,300-acre parcel from the Ewa Manoa Project. The parcel includes miles of waterfront. Construction of Phase 1 began in 1997, when the project was renamed Ocean Pointe. Phase 2 began in 2001. As of May 2003, about 1,000 homes had been sold and built. Hawaii plans to build another 500 homes in Ewa as part of Phase 3 of its Ocean Pointe development. The project will be comprised of a mix of line of homes. Several parks, public spaces, and an 18-hole golf course are also planned for the project. Honolulu plans to build 4,600 homes as part of the Ocean Pointe master plan (Pacific Business News, May 2, 2003, ocean pointe development).

2.3.3.1 Planned Projects

Department of Hawaiian Home Lands

In November 2002, the State of Hawaii and the Department of Hawaiian Home Lands (DHHL) signed a historic agreement to transfer a tract of 1,298 acres, including the proposed new city of Kapolei, to the State. The next step is to begin the process of transferring the lands to the DHHL. The two parcels are to the west of the proposed North South Road and at the

reservoir holding water diverted from the Wai`anae side of the island (PacifiCity Business News, April 2003).

Ko Olina

The Ko Olina project includes the Ko Olina Resort & Marina, a 650-acre major resort approved for hotel in 1994, Marquis’s Plantation & Spa, time-share, commercial, recreational development, including golf courses and a 43-acre marina with 710 full service slips, and private luxury residences.

Letters of intent were signed by hotel conglomerates Hyatt, Marriott and others, stating they would construct additional 250-room and 310-room hotels, respectively. Officials intend to follow suit, such as Hilton, with a 400-room hotel and 250-unit timeshare project, and InterContinental Corp., with a 300-unit village.

Center Elle Snow Properties also plans to build 60 single-family homes and 250 townhouses on 10 acres at Ko Olina (Pacific Business News, May 29 and October 16, 2003).

According to the UIOP’s Land Use Model, Ko Olina had a population of 2,450 in 2000, which is projected to increase to 8,701 by 2025, an increase of 255 percent. The number of housing units is expected to increase from 581 in 2000 to 2,207 units in 2025, or approximately 300 percent. Total employment is projected to increase 596 percent from 3,516 in 2000 to 11,432 in 2025.

According to the developer, Jeff Stone, the Ko Olina project is anticipated to take 10 years, cost $715 million, create 18,800 construction jobs and 2,900 permanent jobs, and generate $166 million in tax revenue (PacifiCity Business News, February 28, 2003).

Ocean Pointe

In 1993, Honolulu Hawaiian, Inc. purchased the 1,300-acre parcel from the Ewa Manoa Project. The parcel includes miles of waterfront. Construction of Phase 1 began in 1997, when the project was renamed Ocean Pointe. Phase 2 began in 2001. As of May 2003, about 1,000 homes had been sold and built. Hawaii plans to build another 500 homes in Ewa as part of Phase 3 of its Ocean Pointe development. The project will be comprised of a mix of line of homes. Several parks, public spaces, and an 18-hole golf course are also planned for the project. Honolulu plans to build 4,600 homes as part of the Ocean Pointe master plan (Pacific Business News, May 2, 2003, ocean pointe development).

2.3.3.1 Planned Projects

Department of Hawaiian Home Lands

In November 2002, the State of Hawaii and the Department of Hawaiian Home Lands (DHHL) signed a historic agreement to transfer a tract of 1,298 acres, including the proposed new city of Kapolei, to the State. The next step is to begin the process of transferring the lands to the DHHL. The two parcels are to the west of the proposed North South Road and at the
northern and southern points of the Kapolei property. The northern property is approximately 49 acres located between Fanning Highway and the H-1 Freeway. Directly to the south is the proposed UH West Oahu property. The southern property is approximately 165 acres and directly adjacent to the UH West Oahu southern boundary. A portion of the southern parcel will require further subdivision for the Kapolei Parkway extension in an east-west orientation.

The mission of DIHL is to develop and deliver sustainable, affordable, and quality homes to qualified native Hawaiian tenants pursuant to the Hawaiian Homelands Commission Act. The acquisition of these parcels allows DIHL to plan and develop approximately 1,000 residential units, and potentially some commercial and community facility uses to serve the new residents over an 8 to 10-year period from 2006 to 2016. Conceptually, the final development is targeted to be completed in 2006.

It is anticipated that DIHL would construct the final parcel of Kapolei Parkway between the southern terminus of North-South Road and the existing cut-through of Kapolei Parkway by the Villages of Kapolei. Therefore, the DIHL project would complete the portion of Kapolei Parkway connecting Ewa and Kapolei, thus allowing traffic to flow on Kapolei Parkway. When this completion of Kapolei Parkway occurs, traffic volumes increase on Kapolei Parkway, pedestrian safety will need to be maintained, in particular for the students attending Kapolei Intermediate School and Kapolei High School, both on Kapolei Parkway and across from the residences in Villages of Kapolei. Additional comments will be made regarding the crossing guardrails to protect pedestrian safety. These design issues will need to be addressed in the design and construction phases of the project.

2.3.3.2 University of Hawai‘i West Oahu

The UH West Oahu is planning to build another campus model of Fanning Highway, west of the proposed North-South Road. At one time the proposed site for the new UH West Oahu campus was marked at the H-1 Freeway. Currently, it is planned for a site near a mall of Fanning Highway. It is anticipated that the UH West Oahu campus will have 7,600 students and 600 staff and faculty by the year 2020 (Ewa DP).

2.3.3.3 East Kapolei Area

The East Kapolei Master Plan (Environmental Impact Statement (EIS)) published in 1998 by the State’s Housing and Community Development Corporation (HDCO) proposed a mixture of residential, commercial, public facility, and open space land uses to replace existing agricultural lands.

The project is no longer being pursued by HDCO, but the UWMQ campus is now planned on its site and a specific plan now exists for the East Kapolei area. However, upon acceptance that some other developer will pursue a similar project within the vicinity of this site in the near future, a brief explanation of the project previously proposed is provided below. According to the UWMQ’s Land Use Model, the 2000 population of the East Kapolei area was 3,655, which is projected to increase to 25,372 by 2025, an increase of approximately 200 percent. Housing units in East Kapolei numbered 1,473 in 2000 and are projected to increase to 7,751 housing units in 2025, an increase of approximately 415 percent. Total employment in 2000 was 1,071 and is projected to increase to 5,221 in 2025, for an increase of approximately 390 percent. The subject property is located on the north by Fanning Highway and H-1 Freeway, to the east by the Villages of Kapolei and the Kapolei Golf Course, to the south and west by the former Elbers Point Naval Air Station and Ewa Villas, and to the north by falling agricultural land. Two separate parcels located between the H-1 Freeway and Fanning Highway consisting of 76 acres and 166 acres were also included in the 1,300 acre project area (East Kapolei Master Plan Final, July 1997).

The development was planned to include access and circulation facilities, pedestrian paths, drainage improvements, distribution lines for potable water, collection lines for wastewater, and communication systems. Once the major infrastructure is in place, long-term development parcels could be sold to developers for construction of new homes and businesses.

2.3.3.4 Mehana

Schuler Homes plans to build 1,150 homes on 120 acres on the edge of Kapolei’s new center, during the next 11 to 16 years. The community, called Mahana, is designed to have six parks, walking and cycling paths, a recreation center, pool, commercial complex, and an approximately 50,000 sq. ft. multi-family and multi-family home Schuler and Gannett Estate plans to contribute a 12-acre adjacent site for a new elementary school. Schuler projects can create an estimated $16 million to the state for road construction, spend $5 million for offsite road improvements related to Mahana, and $6.5 million for road construction and improvements in the East area. Schuler projects its first Mahana home could be built in 2018, with the community growing to about 500 homes between 2010 and 2015. The last homes are expected to take until 2020 to 2025 to Irish (The Honolulu Advertiser, April 30, 2014).

2.4 POTENTIAL CUMULATIVE IMPACTS

2.4.1 Projects Similar in Nature

Future traffic improvements within the Ewa Plain and Central Oahu region would be developed independently of the proposed project. However, they provide linkages within the local and regional transportation system, as does the proposed project. With implementation of future transportation improvements, it is anticipated that all planned roadways intersections would operate under improved conditions. The North-South Road and Kapolei Parkway would become a part of this improved system, and contribute to improving regional and sub-regional mobility, by improving transportation connectivity.
CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S) IMMEDIATELY FOLLOWING
North-South Road and Kapolei Parkway Cumulative and Secondary Impacts Report

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numbered 1,473 in 2000 and are projected to increase to 7,581 housing units in 2025, an increase of approximately 415 percent, while the employment in 2000 was 1,071 and is projected to increase to 5,727 in 2025, for an increase of approximately 318 percent.

The subject property is located on the north by Fanning Highway and H-1 Freeway, to the west by the Wai'anae Mountains, and to the east by the Kapolei Golf Course. To the south it is separated by the former Kahuku Point Naval Air Station and Kuai'ula Village, and to the north by the Kapolei High School. The separate parcels located between the H-1 Freeway and Fanning Highway consisting of 16 acres and 18 acres were also included in the 1,300 acre project area.

The development was slated to include access and circulation roadways, pedestrian paths, drainage improvements, distribution lines for potable water, collection trims for wastewater, and communication systems. Once the major infrastructure is in place, large lot development parcels could be sold to individual developers for construction of new homes and businesses.

3.3.3.4 Mehana

Schuler Hawkins plans to build 1,150 homes on 120 acres on the edge of Kapolei's civic center, along the next 10 to 15 years. The community, called Kapolei Mews, is designed to have six parks, running and cycling paths, a recreation center, pool, commercial complex, and an approximately 150,000-square-foot elementary school. Schulter expects to construct an estimated $16 million to the state for school construction, spend $5 million for on-site road improvements related to Kapolei Mews, and $6.5 million for road construction and improvements in the East Kapolei area. Schulter projects its first Mews home could be built in 2008, with the community growing to about 500 homes between 2010 and 2011. The first homes are expected to be built in 2015 to 2020.

2.4 POTENTIAL CUMULATIVE IMPACTS

2.4.1 Projects Similar in Nature

Future traffic improvements within the Ewa Plain and Central Oahu region would be developed independently of the proposed project improvements. However, they provide linkages within the local and regional transportation system, as does the proposed project. With implementation of future transportation improvements, it is anticipated that all planned roadways and intersections would operate under improved conditions. The North-South Road and Kapolei Parkway would become a part of the improved system, and contribute to improving regional and sub-regional mobility, by improving network connectivity.
Table 1: Cumulative Impacts of Planned Projects in the Area

<table>
<thead>
<tr>
<th>DISCIPLINE</th>
<th>POTENTIAL/ANTICIPATED IMPACTS</th>
</tr>
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<tbody>
<tr>
<td>Land Use</td>
<td>The State and local planning agencies have designated the development of the Ewa Plan as the Secondary Urban Center of Oahu. The area surrounding North-South Road (NSR) was first planned in the Ewa Development Plan (Ewa DP) and Kapolei Area Long Range Master Plan for urban development. However, the NSR and HP Projects are consistent with existing plans for development of the Ewa Plan, including the planned conversion of vacant or agricultural lands for urban use. These projects are consistent with City and County plans for the development of the Ewa Plan as the Secondary Urban Center of Oahu.</td>
</tr>
<tr>
<td>Geology, Soils, Farmland</td>
<td>Construction of NSR will convert approximately 217 acres of prime farmland, some of which is being actively cultivated under short-term leases. HP will affect approximately 10 acres of prime farmland. Farms located near the H-1 Freeway would lose their existing roadway access modified, because their current access road Paanava Road will be displaced by NSR. However, in the long-term, the area surrounding the project is planned for non-agricultural use, and the existing short-term leases will be continued. All planned projects involve the conversion of farmland to urban use. The conversion is consistent with the Ewa DP plan for the development of the area as the Secondary Urban Center for Oahu.</td>
</tr>
</tbody>
</table>

Urban growth will be contained within a boundary which will protect prime agricultural lands along H-1 Freeway.
Cycling Facilities

During early construction activities in the general vicinity of the project area, sidewalks will be added to a bike path along Fort Weaver Road from Farrington Highway to just north of Ewa Beach, and bike lanes on Fort Weaver Road in Ewa Beach. Bike parks are also planned in the Ewa Gentry community along Keonepoko Road, Kapolei Parkway, Palolo Drive, and Kalakaua Road.

NSR and KP would be designated as a bike route, and would develop a modern bicycle preserve plan and provide wide bike lanes paved shoulders that would be suitable for bicycle use. The inter-modal plan of NSR, a parallel pedestrian/bicycle maintenance road limited west of Hahamuth Road would be used as a bike path as well. A bike path would also be extended southward from Ewa Beach. Therefore, several cumulative impacts are anticipated to cycling facilities. On the contrary, the proposed NSR and KP project would contribute to environmental improvement of cycling facilities in the Ewa area.

Social, Cultural, Economic

NSR and KP will improve interrelations between residential areas and centers of employment in the Ewa Plain, as well as support its planned development as the Secondary Urban Center for Oahu.

Construction of NSR and KP project would strengthen economic and social ties between the Ewa Beach/Ocean Park/Ewa by Gentry area and the City and Villages of Kapolei, as well as the more distant areas like the Ocean Park. By increasing access to schools, homes, and commercial establishments.

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Rosedale and the West Loch Naval Magazine Blast Zone for diversified agriculture (Ewa DP)

Potential environmental impacts would occur primarily during construction activities at all sites, due to soil disruption, which should be mitigated by best management practices.

Transportation Infrastructure

Traffic congestion is an existing concern related to continued residential development in the area.

The NSR and KP project is evaluated in a number of development plans (e.g., Ewa DP) in order to address and alleviate traffic congestion and improve access for the proposed developments in the Ewa Plain area. Although development will continue in the Ewa Plain with or without the NSR and KP project, traffic conditions would be considerably worse without the project. KP will also provide improvements between residential areas and employment centers, for both existing and planned developments.

Traffic conditions would be substantially improved along the congested Kua a liliuokalani Rd., Kahului Rd., and Kalakaua Rd. Conditions along Kaaawa Rd. are projected to carry large traffic volumes, all of which would relieve other streets in the study area. Each of the future intersections along the NSR and KP, including those on the H-1 Freeway interchange, are projected to tolerate adequate levels of service. Construction of NSR and KP would serve as an alternative means to access the greater Ewa area. The proposed project would provide additional roadway capacity in a high-growth area and would relieve key congested roads running parallel to it, such as Fort Weaver Road.

The NSR and KP project will also provide substantial and regional access to the University of Hawaii-West Oahu Campus (Kapolei Campus). An access road would connect the adjacent area, residential area with the campus, thereby providing easy access to advanced education facilities to Hawaiian homeowners.

Utilities Infrastructure

Utilities will be provided as a component of each of the proposed development projects. In addition, the City and County of Honolulu Board of Water Supply proposes to build a desalination facility at Koolau that would produce 5 million gallons a day (MGD) of freshwater for Oahu (Draft Environmental Impact Statement for the Proposed Kanahana Desalination Facility, March 2003). The Honolulu Water Recycling Facility and Honolulu Wastewater and Sewage Treatment plants currently serve the area. Construction and expansion of water transmission lines would be coordinated with appropriate City.
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Botany

The proposed project would result in the clearing of vegetation in both the KP and NSR Corridors, roughly 217 acres. With the exception of the endangered state (Abutilon monadelphum), the botanical survey conducted for the project showed that the project corridor is overgrown with weedy plants, and is composed almost exclusively of ruderal or alien species. Thus, vegetation communities that would be cleared by construction activities are not considered ecologically important. Overall, proposed urban landscaping will replace the existing running vegetation and vacant properties.

While there is an immediate adverse effect on individuals in the 10-foot ROW, simultaneous implementation of the Kaloko Conservation Plan (KCP) for A. monadelphum at Kapolei, an integral part of the project action, is anticipated to result in "no jeopardy," and a net gain for the species. The KCP will provide for the continued survival of this rare plant population through the establishment of three offset wetland populations and one offset responsibility site from the degraded coastal wetland population at Kapolei. The KCP also established a temporary plant access area and provides funding for maintenance work, in conjunction with this disturbance of the mountain lady’s tamarisk for A. monadelphum.

Water Resources

Utilities: The EDA has stated that it is unlikely that the project will significantly affect the Southern Oahu Basalt Aquifer (EOBA) and Source Aquifer, especially with the proposed roadway drainage system and stormwater controls in place. The stormwater system proposed for the northern vicinity of NSR and interchange with the N Pali Freeway would collect and convey roadway drainage and infiltration spills along the roadway to a discharge point south of the caprock boundary.

Surface Water Possibilities: NSR will alter the local drainage pattern by interrupting sheet flow across the Ewa Plan. Most of the storm runoff will flow in a drainage system to the east of the NSR and the I-W 1 Freeway, as well as between existing and future communities.

The NSR and KP project will support development of other projects, by providing increased access to jobs, services, shopping, and community facilities for area residents—a socioeconomic benefit.

Dining Process: As part of its residential development, Diamondhead would construct the portion of Kapolei Parkway between North-South Road and the existing cut-de-sac of Kapolei Parkway by the Villas of Kapolei, completing Kapolei Parkway between Ewa and Kapolei. When this occurs, pedestrian safety will need to be maintained on Kapolei Parkway, especially for students of Kapolei Intermediate and Kapolei High Schools. Additional crosswalks, traffic signals, and/or crossing guards may be warranted.

Air Quality

Air quality in the Ewa Plan area should improve with the development of the NSR and KP project, as traffic congestion is relieved on alternative roadways. Potential air quality impacts from construction activities would be short-term, consisting of minor emissions, fugitive dust, and machinery exhaust emissions. Best Management Practices (BMPs) would be implemented to reduce these emissions to a minimal level. The proposed project would have to comply with all National and State Ambient Air Quality Standards.

Noise

Planned residential communities would be constructed either after or roughly simultaneously with NSR and KP, and ambient noise conditions in the region would change as a result of overall urbanization.

Some residents in existing residential communities may experience some increased noise levels from new or improved roadways such as NSR and KP project, as well as the increased traffic levels, as the region continues to experience growth.

The proposed project would have to comply with FHWA regulations on noise impacts (23 CFR 772).

Zoology

The NSR and KP project would convert scrub habitats within the corridor to a roadway. However, it would not threaten the relatively common feral communities in this region because the original natural habitats were on roughly 2,000 acres of former agricultural lands, including within the corridor, where ditches have since been filled and the asphalt has flown across these uplands.

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Historic Resources

Focal and passing by other historic buildings in the area, such as the Ewa Homestead Mission.

Other planned development projects would also contribute to the overall urbanization of the Ewa Plan. Many increase traffic, including the intersection of Kapolei Parkway with Renton Road. However, most changes are not unexpected, because development in Ewa has been widely anticipated, and the appropriate alignments of KP and NGR are well known in the community. There should be no notable incremental impact on historic resources as a result of the NGR and KP project.

Parks & Recreation

Development of NGR and KP will not result right-of-way from any existing parks or recreational facilities. Conversely, development of NGR and KP would facilitate public access to parks and recreational facilities by improving regional mobility in Ewa for area residents. Traffic may increase on Kapolei Parkway, which is adjacent to public parks such as Oahu Park, in Ewa by Bay, and Ewa Marine Park. However, this change cannot be avoided due to the planned urbanization of the Ewa Plan.

Visual & Aesthetic Resources

Both KP and NGR would be designed as urban "parkways," featuring simple landscaping and sidewalks. In the context of existing and planned urban development, neither NGR nor KP are anticipated to represent a visually intrusive addition to the Ewa viewed.

Urbanization and development of the Ewa Plan in general and of the Secondary Urban Center at Kapolei in particular are major goals of the City and County of Honolulu.

Construction of other planned development projects will alter visual resources by replacing the open, undeveloped views of the area with housing, commercial, and public facility developments. The NGR and KP projects would contribute only minimally to the change in the visual landscape, caused by the overall urbanization anticipated in the Ewa Plan. Both NGR and KP are anticipated to be surrounded by new developments, and would become only one element of an urbanized landscape.

Hazardous Materials

Two potentially contaminated sites associated with the Ewa Sugar Mill/Onahau Sugar Co. were identified near the NGR and KP Corridor. Although the mill property is near KP, the main mill operations were located at least 1,000 feet from the alignment. No interaction with hazardous materials is expected.

The two sites should not affect or be affected by planned projects. No additional hazardous materials sites would be affected or created because of any planned development projects, including NGR and KP.

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3.0 SECONDARY IMPACTS

According to the CFI 1506, secondary impacts are impacts that have the potential to occur ‘later in time or farther removed in distance but are still reasonably foreseeable.’ For roadway projects, secondary impacts typically occur because urban development is induced by the project. Development is considered induced if it would not have occurred unless the roadway improvement was made. Induced development can cause additional environmental and social impacts than those directly associated with the road, such as adversely affecting endangered and threatened species and their habitats.

In contrast, the proposed developments identified in Section 2.3.3 would occur regardless of which alternative is selected, including the No Build Alternative. The EIS and KIP project will facilitate the development of D WiFi, telecommunications, and future development of the area called East Kapolei, but will not induce secondary impacts separate from the previously planned development. The EIR was, as previously discussed, has been planned as a Secondary Urban Center for Oahu, with the expansion of the City of Kapolei and area as the focal point of this development activity. Therefore, the Build Alternatives would not induce additional development, and would not cause adverse secondary impacts, because the proposed roadway construction has been anticipated and incorporated into the planning of other developments in the region.


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