



**REVISED DRAFT
NEW KAUA'I LANDFILL
TRAFFIC AND ROADWAYS ENGINEERING
FEASIBILITY STUDY**

County of Kaua'i
Department of Public Works
Solid Waste Division
4444 Rice Street, Room 275
Līhu'e, Kaua'i, Hawai'i

September 2016

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Prepared for:

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Department of Public Works
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EXECUTIVE SUMMARY

This Traffic and Roadways Engineering Feasibility Study (TREFS) analyzes traffic impacts, recommended roadway improvements, and potential social impacts of five potential access routes between Kūhiō Highway and the site of the County of Kauaʻi's proposed new municipal solid waste landfill (MSWLF) and resource recovery park (RRP) at Maʻalo (the proposed project), north of Līhuʻe town. The County's existing sole MSWLF at Kekaha is projected to reach capacity in the coming years; therefore the County seeks to establish a new MSWLF to fulfill its responsibility for properly managing and disposing of municipal solid waste on the island. While a new waste disposal facility must be operational by the time the Kekaha MSWLF reaches capacity, the RRP may be implemented incrementally over time.

An Environmental Impact Statement (EIS) is being prepared to evaluate the environmental impacts of and alternatives to the proposed project; as a result of early public outreach during the planning process, the choice of access routes to the proposed project site has emerged as an important public consideration. The proposed access route selected as a result of this analysis will become part of the proposed project that will be analyzed in the overall project EIS. Each alternative access route consists of a "road" (labelled A through E) and up to two "driveway" alternatives (labelled 1 through 3) and connects to regional access at one of five study intersections:

- **Route A1/A2:** via Maʻalo Road and Driveway 1 or Driveway 2. The study intersection is Maʻalo Road/Kūhiō Highway, a stop-sign-controlled T-intersection. Total route length is 4.7–4.8 miles.
- **Route B1/B2:** via ʻEhiku Street, Maʻalo Road, and Driveway 1 or 2. The study intersection is ʻEhiku Street/Kūhiō Highway, a signalized intersection. Total route length is 5.6–5.7 miles.
- **Route C3:** via Lāulima Street and Driveway 3. The study intersection is Lāulima Street/Kūhiō Highway, a stop-sign-controlled four-legged intersection. Total route length is 1.7 miles.
- **Route D3:** via Roberts Hawaii Driveway and Driveway 3. The study intersection is Roberts Hawaii Driveway/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.2 miles.
- **Route E3:** via Kauaʻi Beach Driveway and Driveway 3. The study intersection is Kauaʻi Beach Driveway/Kūhiō Highway (a stop-sign-controlled T-intersection). Total route length is 2.5 miles.

In addition, the traffic assessment evaluated the currently signalized Kapule Highway/Kūhiō Highway intersection, to evaluate traffic queuing issues that could potentially result from operation of the D3 and E3 alternative access routes.

This TREFS contains three major sections: a traffic assessment, an infrastructure improvements assessment, and a social impacts assessment, which are summarized in the following.

Traffic Assessment. The traffic assessment evaluated existing traffic conditions (including intersection operating conditions) and future conditions, both during initial project implementation (i.e., opening year) and in the long range (i.e., 20 years after opening year). Each future condition evaluation assessed three future scenarios:

- Projected baseline conditions (i.e., without proposed project implementation)
- Projected baseline conditions plus operation of the MSWLF
- Projected baseline conditions plus operation of the MSWLF and the RRP

Each evaluation assessed traffic impacts at each study intersection with proposed project vehicles both using and not using that intersection for access. Evaluations of each access scenario indicated potential traffic impacts at their Kūhiō Highway intersection that should be addressed via physical and operational improvements:

- **Route A1/A2:** Would require highway intersection signalization and other significant modifications, as well as other significant improvements to the existing roadways.
- **Route B1/B2:** Would require significant improvements to the existing roadways along the length of the route, and would result in increased traffic to the roads used by the existing adjacent residences.
- **Route C3:** Would require development of the route, including signalizing the highway intersection by the time the project is fully implemented.
- **Route D3:** Would require development of the route, including signalizing the highway intersection upon full project implementation. Signalization would need to be synchronized with the existing signalization at the nearby Kapule Highway intersection to accommodate vehicle queuing during the PM peak hour.
- **Route E3:** Would require development of the route, including signalizing the intersection upon full project implementation. Signalization would need to be synchronized with the existing signalization at the nearby Kapule Highway intersection to accommodate vehicle queuing there during AM peak hour. Intersection improvements would also have to accommodate the contra-flow operation on Kūhiō Highway during the AM peak period.

The traffic assessment concluded that Route C3 (followed closely by Routes D3 and E3) is the shortest and most direct, implementable, feasible, and cost-effective access alternative.

Infrastructure Improvements Assessment. The infrastructure improvements assessment evaluated existing conditions and recommended improvements, as well as permitting, land use, and land acquisition requirements and related costs for each proposed access route. All access scenarios involve paving of most or all of the potential route, and providing underground utility service to the proposed project site.

The planning-level cost estimates for the recommended roadway and infrastructure improvements under each access scenario are:

- **Route A1:** \$42.8 million
- **Route A2:** \$41.4 million
- **Route B1:** \$43.3 million
- **Route B2:** \$41.8 million
- **Route C3:** \$12.7 million
- **Route D3:** \$14.6 million
- **Route E3:** \$17.3 million

The infrastructure improvements assessment concluded that Route C3 (followed closely by Routes D3 and E3) is the shortest and most direct, implementable, feasible, and cost-effective proposed-project access alternative.

Social Impacts Assessment. A social impacts assessment (SIA) was conducted and supplemented by multiple public meetings to evaluate the opinions and concerns of the public. The SIA evaluated advantages and disadvantages for each proposed access route, including potential public safety,

traffic, and nuisance concerns. Sources for the assessment include interviews conducted for the overall project EIS, interviews with landowners and transportation specialists, examination of traffic engineering reports and existing roadway characteristics, and review of route maps and social characteristics of nearby communities. Findings include:

- **Route A1/A2:** Second longest route; avoids residential areas; increased truck traffic could negatively impact Wailua Falls tourist traffic, which uses Ma'alo Road.
- **Route B1/B2:** Longest route; may result in direct traffic impacts to the residential portion of the route; improved roadway and infrastructure improvements would benefit all users; the highway intersection with the least traffic-related issues of all the alternatives.
- **Route C3:** Shortest route; signalization of intersection would benefit the Hanamā'ulu community for which it serves as a point of egress; potential noise impacts to the residential area where the proposed route runs behind it.
- **Route D3:** Second shortest route; improved roadway would benefit all users; potential noise impacts to residents near the route; reduces traffic activity in the Hanamā'ulu community area.
- **Route E3:** Third shortest route; signalization of intersection could increase safety for traffic accessing the Kaua'i Beach Resort area; potential noise impacts to residents near the route; minimizes traffic activity in the Hanamā'ulu community area.

The SIA identified pros and cons associated with each alternative access route, and concluded that access routes C3, D3, and E3 provide the best balance of feasibility, traffic impacts, cost requirements, and other impacts. As noted by community members during the public outreach process, Route E would minimize the traffic impact to the core of Hanamā'ulu and pass fewer residences and businesses, and is therefore preferred by the local community.

Proposed Access Route. This TREFS analyzed five potential access routes from Kūhiō Highway (the principal thoroughfare in the area) to the proposed project (MSWLF and RRP at Ma'alo). The TREFS both analyzed objective data (such as traffic impacts, recommended improvements, and related costs) and solicited the concerns and opinions from the public, particularly those most directly affected by the choice of the proposed access route. All access scenarios present potential impacts that can be addressed via physical and operational improvements.

Overall, Access Routes C, D, and E provide the best balance of feasibility, directness, traffic impacts, cost requirements, and other impacts. While these three routes are progressively longer and therefore progressively more expensive, few other significant technical advantages or disadvantages distinguish Routes C, D, and E. However, members of nearby communities expressed a preference for Access Route E, which would minimize the traffic impact to the core of Hanamā'ulu and pass fewer residences and businesses. Therefore, while Route C is slightly preferable from a technical and financial standpoint, in order to address concerns raised by the community during the early planning process, the County has selected Access Route E as the preferred access route, which will become part of the proposed project in the overall project EIS.

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ACB	asphalt concrete base
ACP	asphalt concrete pavement
ADA	American Disabilities Act
DOH	Department of Health, State of Hawai'i
DOT	Department of Transportation, State of Hawai'i
DPW	Department of Public Works, County of Kaua'i
EB	eastbound
EIS	environmental impact statement
FS	feasibility study
ft	feet or foot
gpd	gallons per day
HCM	Highway Capacity Manual
LOS	level of service
MG	million gallons
MSW	municipal solid waste
MSWLF	municipal solid waste landfill
MUTCD	Manual on Uniform Traffic Control Devices
NB	northbound
NPDES	National Pollutant Discharge Elimination System
OR	comments from outreach activities conducted after the public meeting
PM	comments gathered at the Public Meeting
Pre	pre-public meeting comments gathered from stakeholder and landowner interviews
ROW	right-of-way
RRP	resource recovery park
SB	southbound
SIA	social impacts assessment
SWD	Solid Waste Division, County of Kaua'i Department of Public Works
TREFS	traffic and roadways engineering feasibility study
USACE	United States Army Corps of Engineers
WB	westbound

1.0 INTRODUCTION

The County of Kaua'i (County) Department of Public Works (DPW) Solid Waste Division (SWD) is responsible for properly managing and disposing of municipal solid waste (MSW) on the island. The existing Kekaha Municipal Solid Waste Landfill (MSWLF) is projected to reach capacity in the coming years. Therefore, a new landfill facility will be required to achieve the overall project objective of providing for the safe and proper disposal of all forms of MSW that cannot practicably be further reused, recycled, or otherwise recovered.

Based on previous facility siting efforts spanning over 12 years and culminating in a Landfill Siting Study completed in 2012 (AECOM 2012), the County proposes to develop a new MSWLF and resource recovery park (RRP) north of Līhu'e town, makai of Ma'alo Road (the proposed project). Potential recycling and waste diversion facilities that may be implemented at the RRP were evaluated and presented to the public in the RRP Feasibility Study (FS) (AECOM 2013). In order to provide the County additional flexibility, two implementation options for the overall project are being considered:

- MSWLF and RRP located on the same 264-acre parcel
- MSWLF located on the 264-acre parcel, and RRP located on an alternate 80-acre nearby parcel

An Environmental Impact Statement (EIS) is being prepared to evaluate the environmental impacts of and alternatives to the proposed project. As a result of the initial public scoping and outreach conducted to date, the choice of access routes has emerged as an important consideration, due to potential impacts such as traffic, noise, and safety. Therefore, this Traffic and Roadways Engineering Feasibility Study (TREFS) conducts an analysis of several feasible access route alternatives to assist in the decision-making process and provide a rational basis for selecting the proposed-project access route. For each access route, the TREFS analyzes traffic impacts, required improvements and related costs, and social impacts, including safety and nuisance concerns. The proposed access route will become part of the proposed project in the overall project EIS.

Because the RRP may undergo phased implementation over time, for the purpose of this TREFS, two proposed project scenarios are analyzed for each potential access route:

- MSWLF only
- MSWLF plus RRP

Figure 1 shows the proposed MSWLF site, the alternate RRP site (collectively, the "proposed project site"), and the potential access routes analyzed in this TREFS. Each potential route consists of a "road" designated with a letter and a "driveway" designated with a number, as shown in Figure 1. Generally, the "driveways" are former cane haul ("dirt") roads, and several of the "roads" are paved public roadways. Based on initial feedback received, the County has identified five alternative access routes from Kūhiō Highway to the proposed project site:

- Route A1/A2: via Ma'alo Road and Driveway 1 or Driveway 2
- Route B1/B2: via 'Ehiku Street, Ma'alo Road, and Driveway 1 or Driveway 2
- Route C3: via Lāulima Street and Driveway 3
- Route D3: via Roberts Hawaii Driveway and Driveway 3
- Route E3: via new Driveway opposite Kaua'i Beach Driveway and Driveway 3

All these alternative access routes connect to Kūhiō Highway for regional access at one of the following five study intersections evaluated in this study:

- Ma'alo Road / Kūhiō Highway (stop-sign-controlled T-intersection) (Route A)
- 'Ehiku Street / Kūhiō Highway (signalized intersection) (Route B)
- Laulima Street / Kūhiō Highway (stop-sign-controlled four-legged intersection) (Route C)
- Roberts Hawaii Driveway / Kūhiō Highway (stop-sign-controlled T-intersection) (Route D)
- Kāua'i Beach Driveway/ Kūhiō Highway (stop-sign-controlled T-intersection) (Route E)

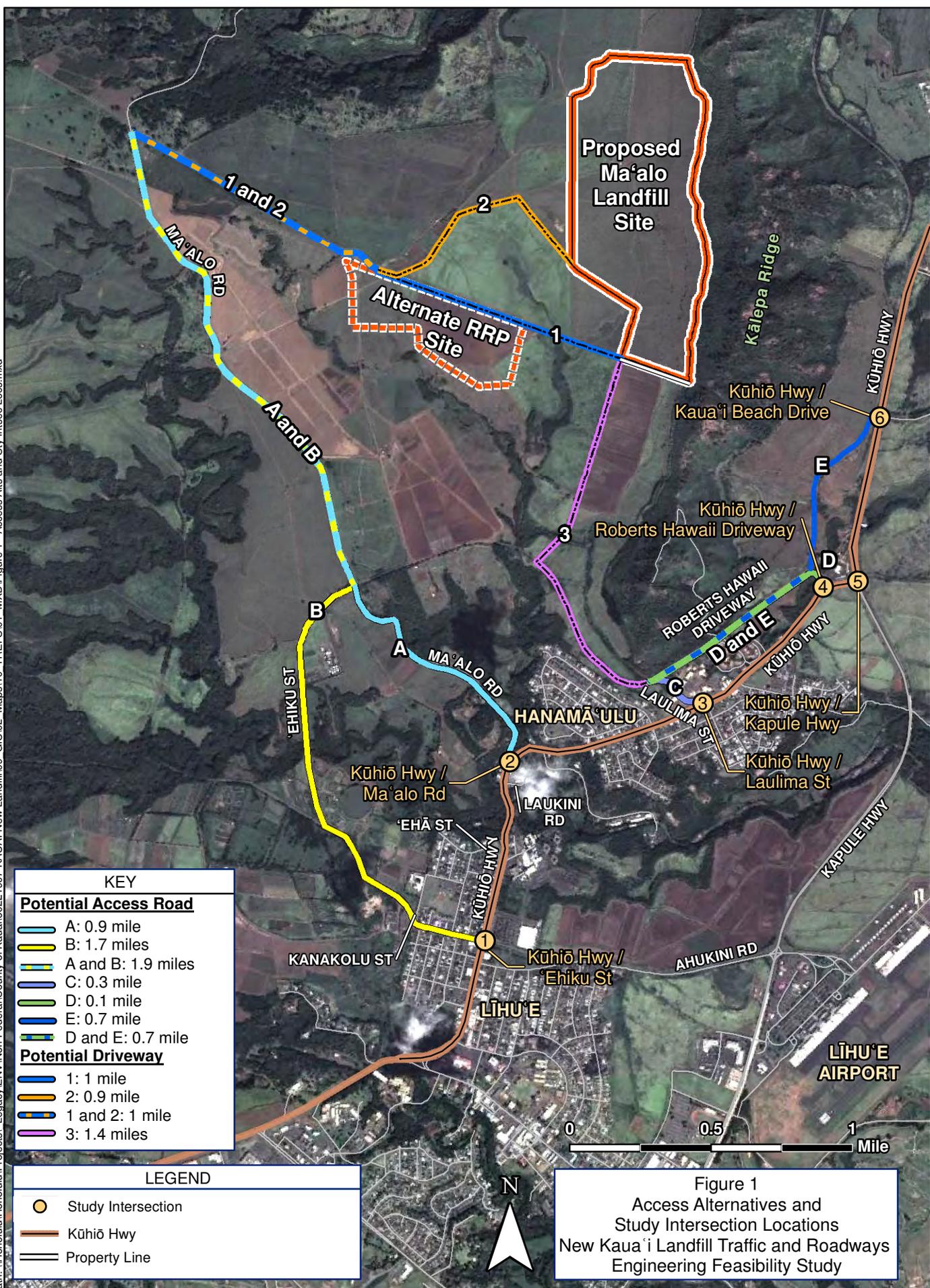
Additionally, the Kapule Highway / Kūhiō Highway (signalized) intersection was evaluated, because it is a major intersection that could be affected by operation of nearby Routes D and E.

The analyses conducted, and the public feedback gathered, during this study have provided the County information to consider in choosing the proposed access route, which will become part of the proposed project in the overall project EIS.

The report is organized as follows:

- Section 1.0 describes the background and purpose of this study, and the overall organization of this report.
- Section 2.0 presents the traffic impacts assessment for the six study intersections under the various project-access scenarios.
- Section 3.0 presents the infrastructure improvements assessment for the five alternative access routes.
- Section 4.0 presents the social impacts assessment for the five alternative access routes.
- Section 5.0 compares the five alternative access routes and identifies the proposed route.
- Section 6.0 presents a list of references cited in this document.

Path: \\Honolulu\Honolulu\Projects\Legacy\ENV\Non-Federal\County of Kauai\60221907 KAUAI\New Landfill\09_GIS\02_Maps\10_TREES\01_MXD\Figure 1 - Access Alts and Stv Intsec Locs.mxd



KEY	
Potential Access Road	
	A: 0.9 mile
	B: 1.7 miles
	A and B: 1.9 miles
	C: 0.3 mile
	D: 0.1 mile
	E: 0.7 mile
	D and E: 0.7 mile
Potential Driveway	
	1: 1 mile
	2: 0.9 mile
	1 and 2: 1 mile
	3: 1.4 miles

LEGEND	
	Study Intersection
	Kūhiō Hwy
	Property Line

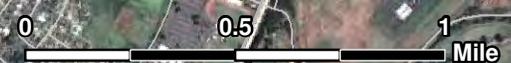


Figure 1
 Access Alternatives and
 Study Intersection Locations
 New Kaua'i Landfill Traffic and Roadways
 Engineering Feasibility Study

2.0 TRAFFIC ASSESSMENT

The objective of this traffic assessment is to quantify the proposed project's effects on traffic operations, identify potential mitigation actions, and assess the relative traffic-related impacts of each access alternative. The assessment evaluates weekday traffic-related impacts of the proposed project at each of the six study intersections with Kūhiō Highway ('Ehiku Street, Ma'alo Road, Laulima Street, Roberts Hawaii Driveway, Kaua'i Beach Driveway, and Kapule Highway), assuming the implementation of each of the project alternatives via one of the five proposed alternative access routes, for the following horizon years/scenarios:

- Existing Conditions
- Future Opening Year (assumed to be approximately 10 years from now) and Future Long-Range Year (20 years after opening):
 - Baseline (i.e., without the proposed project)
 - Baseline plus MSWLF
 - Baseline plus MSWLF and RRP

The location of the proposed project site, the six study intersections, and the five alternative access routes are shown on Figure 1.

2.1 EXISTING CONDITIONS

Existing conditions at the five access routes are evaluated below.

2.1.1 Transportation Network

The following key roadways are located throughout the proposed project study area:

- Kūhiō Highway is a State Highway traversing the northern and eastern shores of Kaua'i, extending from Ha'ena State Park in the north to Līhu'e, where it terminates at Rice Street at the junction with Kaumuali'i Highway (State Highway 50), which continues west to Kekaha. Within the study area, Kūhiō Highway is designated as State Highway 56 and runs in a southwest–northeast orientation, generally providing one lane in each direction, widening to accommodate turn pockets or additional storage at select intersections. A second northbound lane is provided from the junction with Kapule Highway in Hanamā'ulu north to Wailuā. Primarily functioning as a rural highway, Kūhiō Highway generally lacks sidewalks within the study area, with the exception of some isolated segments partially present on one side of the street through the urbanized portions of Hanamā'ulu and Līhu'e. Each Access Route would have one terminus at its intersection with Kūhiō Highway.
- Ma'alo Road is a north–south collector roadway designated as State Highway 583, connecting to Kūhiō Highway at the border between Hanamā'ulu and Līhu'e and continuing north to a dead-end terminus at Wailuā Falls. Within the study area, Ma'alo Road is a paved roadway providing one travel lane in each direction. Ma'alo Road functions primarily as a rural roadway through largely undeveloped areas with little street-fronting activity, and no sidewalks are provided on either side. Access Routes A and B would each use a portion of Ma'alo Road.
- 'Ehiku Street is a collector roadway generally oriented in a north–south direction, extending from Kūhiō Highway in the south to its terminus at the intersection with Ma'alo Road in the north. Within the study area, 'Ehiku Street is paved and provides one travel lane in each direction. Although the southern end of 'Ehiku Street serves residential areas in Līhu'e, sidewalks are generally not provided on either side of 'Ehiku Street. Access Route B would use the portion of 'Ehiku Street between Kūhiō Highway and Ma'alo Road.

- Laulima Street is a short collector roadway generally oriented in the northeast–southwest direction, extending from Lawehana Street makai of Kūhiō Highway in the east to a privately-owned cane-haul road mauka of Kūhiō Highway in the east. Makai of Kūhiō Highway, Laulima Street is an improved roadway with one travel lane in each direction, providing local access for residential neighborhoods in Hanamā'ulu. Mauka of Kūhiō Highway, Laulima Street is partially paved but otherwise unimproved, primarily serving as a driveway for light industrial uses along the side of the highway. Sidewalks are generally not provided on either side of Laulima Street, and the highway intersection is currently not signalized. Access Route C would use the short portion of Laulima Street mauka of Kūhiō Highway.
- The Roberts Hawaii Driveway is a short collector roadway along the mauka side of Kūhiō Highway, primarily providing local access for a vehicle maintenance and storage yard for tour operator Roberts Hawaii, Inc. The Roberts Hawaii Driveway is mostly a gravel road, with a short paved section near its intersection with Kūhiō Highway, approximately 400 feet west of the Kūhiō Highway / Kapule Highway intersection. Access Route D would include the Roberts Hawaii Driveway to connect a privately-owned cane-haul road to Kūhiō Highway.
- Kapule Highway is a north–south rural arterial located makai of Kūhiō Highway, extending from the junction with Kūhiō Highway in the north to Rice Street in Nāwiliwili in the south. Kapule Highway is designated as State Highway 51, and provides access to Līhu'e Airport, generally featuring one travel lane in each direction. Within the study area, Kapule Highway functions as a rural highway through undeveloped areas with little street-fronting activity, and no sidewalks are provided on either side. No access route extends to Kapule Highway, but Access Routes D and E have the potential to affect traffic at the intersection of Kūhiō Highway and Kapule Highway, unless properly managed.
- Kaua'i Beach Drive is a mauka–makai collector road providing local access from Kūhiō Highway to Nukoli'i Beach Park and several resorts at Kaua'i Beach. Kaua'i Beach Drive features one travel lane in each direction, widening to two lanes in each direction within the Kaua'i Beach resort area, but lacks sidewalks and highway signalization. Access Route E terminates on the mauka side of Kūhiō Highway, directly opposite Kaua'i Beach Drive.

In addition to existing roadways, each Access Route uses existing cane haul roads (“dirt roads”) located on State or private property, including “Driveways” 1, 2, and 3. Access Routes A and B could be configured to use either Driveway 1 or 2, while Access Routes C, D, and E would use Driveway 3, along with cane haul roads located on private property.

Pedestrian crossings across Kūhiō Highway within the study area are present only at the signalized intersections at Hanamā'ulu Road and Laukona Street in Hanamā'ulu and at 'Ehā Street and Oxford Street in Līhu'e. The Kūhiō Highway intersections at 'Ehiku Street, Ma'alo Road, Laulima Street, Roberts Hawaii Driveway, and Kaua'i Beach Drive do not have crosswalks across Kūhiō Highway. With the exception of 'Ehiku Street, the cross-streets also have no crosswalks.

2.1.2 Kūhiō Highway Traffic Management

Traffic is managed along the 4-lane portion of Kūhiō Highway between the Kapule Highway intersection to Wailuā, using transient lane operations to increase vehicle throughput during the weekday morning peak commute periods. The transient lane is managed to provide a third, temporary contra-flow southbound travel lane during weekday mornings; at all other times, two lanes travel in both directions. If not properly designed and managed, the access routes have the potential to affect traffic along this section of Kūhiō Highway.

The transient lane operates from approximately 5:30 AM to 10:00 AM, using traffic cones placed along Kūhiō Highway from the junction at Kapule Highway in Hanamā'ulu to the junction with State Highway 5600 (Kapa'a Bypass Road) near Papaloa Road in Wailuā. At the Kūhiō Highway / Kapule

Highway intersection, the southbound contra-flow lane is directed into the through lane to Kapule Highway, and the normal through lane is directed into the right-turn lane to the continuation of Kūhiō Highway. Because the right-turn lane is less restrictive than the through lane the queue for this movement is significantly less than the queue for the through lane directed to Kapule Highway. As a result, some of the right-turning traffic makes a U-turn maneuver at the Roberts Hawaii Driveway, proceeding back to the Kūhiō Highway/ Kapule Highway intersection, where it makes a right-turn to continue on to Kapule Highway. Turning movement counts during the weekday AM peak hour recorded approximately 120 vehicles making this U-turn movement.

At the Kūhiō Highway / Kaua'i Beach Drive intersection, the traffic cones are placed to provide two southbound through lanes and a southbound left-turn pocket and maintain the slip lane into southbound Kūhiō Highway for westbound left-turn movements from Kaua'i Beach Drive.

2.1.3 Intersection Operating Conditions

This intersection analysis uses the *Highway Capacity Manual* (HCM) methodology (TRB 2010), which is based on Level of Service (LOS). The LOS methodology is a qualitative description of the performance of an intersection based on average delay per vehicle. For signalized intersections, the HCM methodology determines the capacity of each lane group approaching the intersection. The LOS is then determined based on the average delay (in seconds per vehicle) incurred for the various movements within the intersection. Adjustments are typically made to the capacity of each intersection to account for local conditions. A combined weighted average delay and LOS are then presented for the intersection. For unsignalized intersections (i.e., stop-controlled), LOS is based on the average delay experienced at the worst-operating stop-controlled approaches. LOS ranges from LOS A, which indicates free-flow conditions with short delays, to LOS F, which indicates congested conditions with extremely long delays. An explanation of the LOS, including delay ranges, for signalized and unsignalized intersections is provided in Table 1.

Table 1: Criteria for Intersection Level of Service

Unsignalized Intersections		LOS Grade	Signalized Intersections	
Description	Average Total Vehicle Delay (Seconds)		Average Control Vehicle Delay (Seconds)	Description
No delay for stop-controlled approaches.	≤ 10.0	A	≤ 10.0	<i>Insignificant delays:</i> No approach phase is fully utilized and no vehicle waits longer than one red indication.
Operations with minor delays.	> 10.0 and ≤ 15.0	B	> 10.0 and ≤ 20.0	<i>Minimal delays:</i> An occasional approach phase is fully utilized. Drivers begin to feel restricted.
Operations with moderate delays.	> 15.0 and ≤ 25.0	C	> 20.0 and ≤ 35.0	<i>Acceptable delays:</i> Major approach phase may become fully utilized. Most drivers feel somewhat restricted.
Operations with some delays.	> 25.0 and ≤ 35.0	D	> 35.0 and ≤ 55.0	<i>Tolerable delays:</i> Drivers may wait through more than one red indication. Queues may develop but dissipate rapidly, without excessive delays.
Operations with high delays and long queues.	> 35.0 and ≤ 50.0	E	> 55.0 and ≤ 80.0	<i>Significant delays:</i> Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues form upstream.

Unsignalized Intersections		LOS Grade	Signalized Intersections	
Description	Average Total Vehicle Delay (Seconds)		Average Control Vehicle Delay (Seconds)	Description
Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50.0	F	> 80.0	<i>Excessive delays:</i> Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.

Source: Transportation Research Board, *Highway Capacity Manual*, 2010.

Input data used to calculate the LOS included traffic volumes, existing lane configurations, traffic control types, signal operation, and traffic speeds; these data were collected at each of the study intersections over the course of three survey days: Wednesday, July 17, 2013 and Tuesday and Wednesday, September 13 and 14, 2015. Movement counts were conducted during the weekday AM and PM peak hours, which are defined as the highest volume one-hour (four consecutive 15-minute intervals) periods between the hours of 7:00 AM to 9:00 AM, and 4:00 PM to 6:00 PM, respectively. Recorded field observations included existing lane configurations, traffic control types, signal operations, traffic volume, and traffic speeds. These data were input to the Synchro 8.0 software package to calculate the LOS using the HCM methodology.

The existing lane geometries and weekday AM and PM peak hour traffic volumes at the study intersections are illustrated in Figure 2 and Figure 3, respectively. Weekday AM and PM peak hour LOS at each study intersection is summarized in Table 2. Detailed LOS output summaries are included in Appendix B.

Table 2: Level of Service – Existing Conditions

Intersection	Traffic Control	Weekday AM Peak Hour		Weekday PM Peak Hour	
		LOS	Delay	LOS	Delay
1 Kūhiō Highway / 'Ehiku Street	Signal	A	4.1	A	3.7
2 Kūhiō Highway / Ma'alo Road	One-Way Stop	C	21.9	D	31.7
3 Kūhiō Highway / Laulima Street	Two-Way Stop	E	38.5	F	63.8
4 Kūhiō Highway / Roberts Hawaii Driveway	One-Way Stop	D	27.2	C	19.6
5 Kūhiō Highway / Kapule Highway	Signal	C	20.6	C	35.0
6 Kūhiō Highway / Kaua'i Beach Drive	One-Way Stop	F	107.0	F	57.5

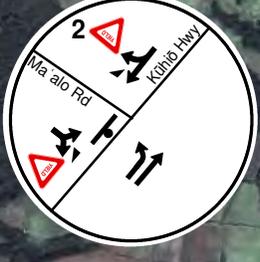
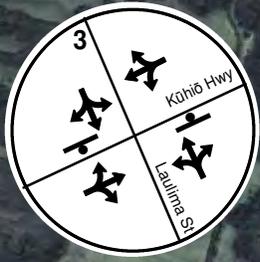
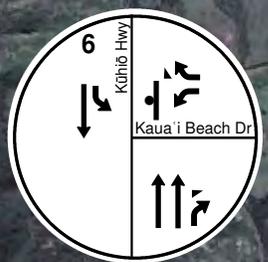
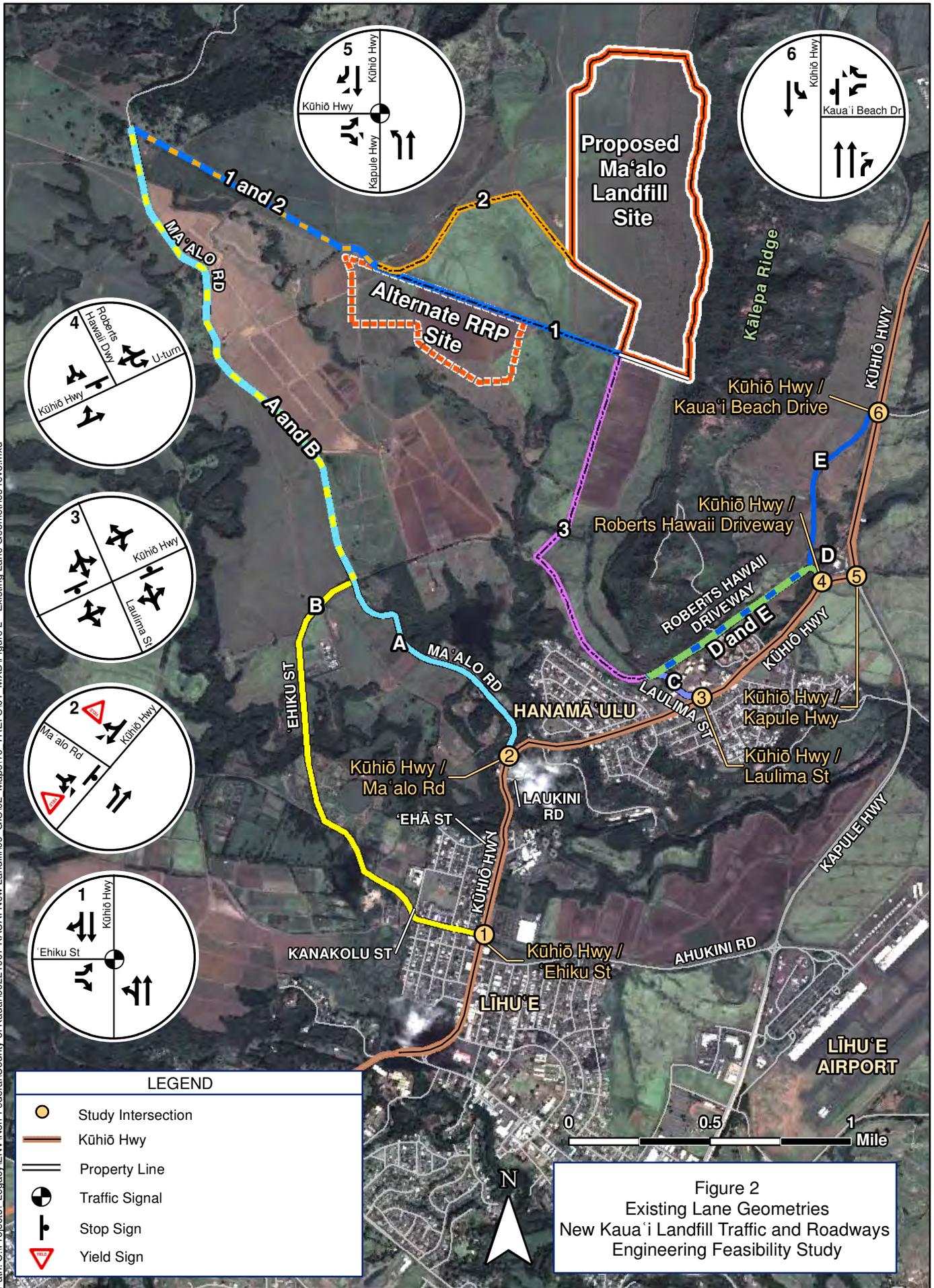
Notes:

LOS and average delay for stop-controlled intersections represents the worst stop-controlled approach.

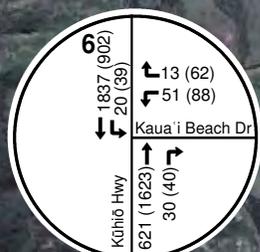
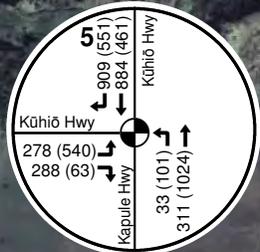
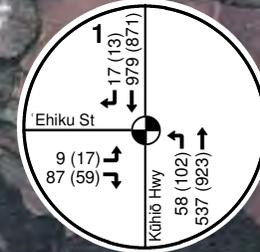
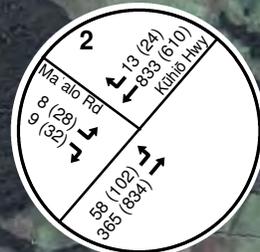
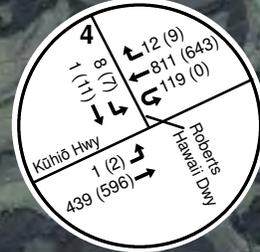
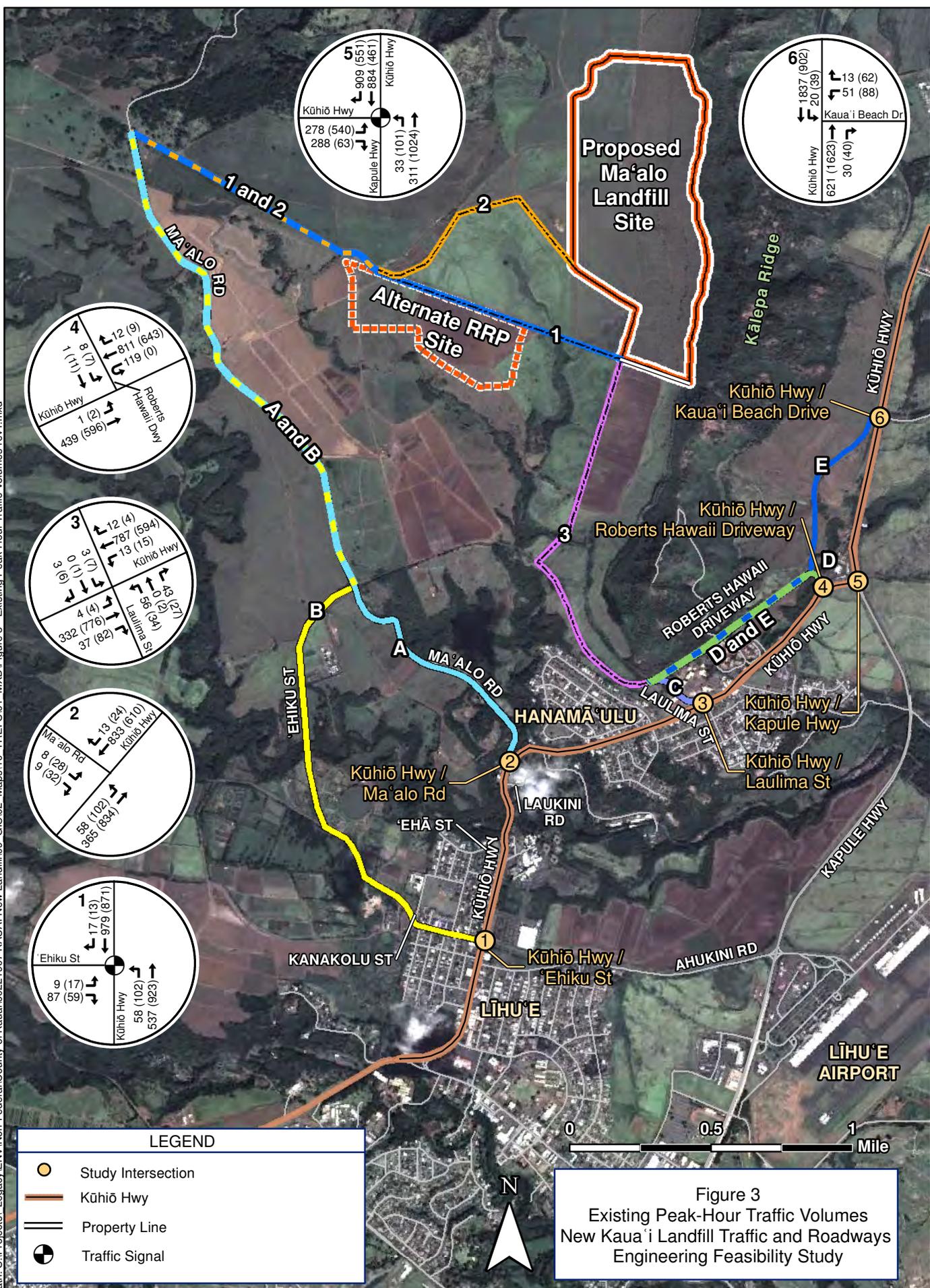
Bold indicates LOS E or LOS F.

As shown in Table 2, the Kūhiō Highway intersections at 'Ehiku Street, Ma'alo Road, Roberts Hawaii Driveway, and Kapule Highway currently operate at LOS D or better during both the weekday AM and PM peak hours. The intersections at Laulima Street and Kaua'i Beach Drive, however, currently operate at LOS E or LOS F during both the weekday AM and PM peak hours due to side-street delay. Although a detailed engineering study would be required to confirm whether a signal is warranted, an analysis of the Manual on Uniform Traffic Control Devices (MUTCD) peak-hour traffic signal warrants indicates that, under existing conditions, the Kūhiō Highway / Laulima Street intersection may not satisfy the warrant during either peak hour, and the Kūhiō Highway / Kaua'i Beach Drive intersection may only satisfy the warrant during the weekday PM peak hour. Peak-hour traffic signal warrant worksheets are included in Appendix B.

Path: S:\Projects\Legacy\ENV\Non-Federal\County of Kauai\60221907 KAUAI-New Landfill\09_GIS\02_Maps\10_TREFS\01_MXD\Figure 2 - Existing Lane Geometries rev3.mxd



Path: S:\Projects\Legacy\ENV\Non-Federal\County of Kauai\60221907 KAUAI-New Landfill\09_GIS\02_Maps\10_TREFFS\01_MXD\Figure 3 - Existing Peak-Hour Traffic Volumes-rev1.mxd



LEGEND

- Study Intersection
- Kūhiō Hwy
- Property Line
- Traffic Signal

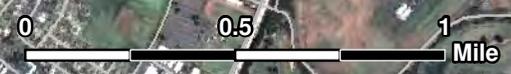


Figure 3
Existing Peak-Hour Traffic Volumes
New Kaua'i Landfill Traffic and Roadways
Engineering Feasibility Study

2.2 FUTURE CONDITIONS

Anticipated future conditions were estimated with and without the proposed project. Because the RRP may be implemented in phases over time, future conditions with the project were analyzed under two scenarios: operation of the MSWLF only; and operation of both the MSWLF and the RRP. Anticipated conditions were projected both for the year that operations would commence ("Opening Year") and for 20 years after operations would commence ("Future Long-Range Year"). Thus, for each of the five Access Route alternatives, six scenarios were analyzed:

- Opening Year Baseline
- Opening Year with Landfill
- Opening Year with Landfill and RRP
- Future Long-Range Year Baseline
- Future Long-Range Year with Landfill
- Future Long-Range Year with Landfill and RRP

2.2.1 Future Baseline Conditions

Future baseline traffic conditions (i.e., without the proposed project) were forecasted by assuming a one-percent-per-year (compounded) growth rate applied to the Existing Conditions traffic volumes (Figure 3), in accordance with the *2012 State of Hawaii Data Book*, Table 1.07 (DBEDT 2012), which is consistent with the analysis performed for the RRP Feasibility Study that was conducted for the proposed project. Traffic volume summaries for Opening Year Baseline Conditions and Future Long-Range Year Baseline Conditions are provided in Appendix A.

2.2.2 Project Traffic

2.2.2.1 PROJECT TRAFFIC QUANTITY

Table 3 and Table 4 summarize the anticipated traffic due to the MSWLF and RRP, based on County-provided landfill trip generation data for the Kekaha MSWLF, and traffic projections presented in the RRP FS (AECOM 2013). These data were used to project weekday AM peak, PM peak, and daily vehicle-trip totals to and from the proposed project site for both the Opening Year and the Future Long-Range Year conditions.

Table 3: Trip Generation – Opening Year

Project Component	Daily	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Landfill	220	15	15	12	15
RRP	517	130	26	22	130
Total	737	145	41	34	145

Table 4: Trip Generation – Future Long-Range Year

Project Component	Daily	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Landfill	270	19	18	15	18
RRP	517	130	26	22	130
Total	787	149	44	37	148

2.2.2.2 TRIP DISTRIBUTION

The expected distribution pattern of project traffic was estimated based on a combination of the anticipated origins and destinations of trucks, as well as the general population distribution on Kaua'i, as documented in the *2012 State of Hawaii Data Book*, Table 1.17 (DBEDT 2012). Based on this information, the following trip distribution was assumed:

- To and from the south (via Kūhiō Highway): 55%
- To and from the north (via Kūhiō Highway): 45%

2.2.3 Project Opening Year

The estimated traffic generated by the proposed landfill and RRP, summarized in Table 3 was added to the opening year baseline traffic volumes to obtain anticipated traffic volumes for the Opening Year, both with and without the RRP. Operations at the six study intersections were evaluated for each scenario and access alternative using the Synchro 8.0 software package and the HCM methodology, as described in Section 2.1.3. Anticipated traffic volumes for each access alternative under these Opening Year scenarios are included in Appendix A, and detailed LOS output summaries are included in Appendix B. The resulting LOS for Opening Year plus Landfill Conditions and Opening Year plus Landfill and RRP Conditions during both the weekday AM and PM peak hours is summarized in Table 5.

Table 5: Level of Service – Opening Year

Access Alternative	Intersection	Weekday Peak Hour											
		No Project				Project							
		AM		PM		Landfill		Landfill and RRP					
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay				
'Ehiku St.	1 Kūhiō Hwy. / 'Ehiku St.	A	4.2	A	3.9	A	4.7	A	4.3	A	5.6	A	7.7
	2 Kūhiō Hwy. / Ma'alo Rd.	C	24.4	E	39.1	C	24.8	E	40.0	D	27.0	E	45.3
	3 Kūhiō Hwy. / Laulima St.	F	50.3	F	92.6	F	52.6	F	96.4	F	66.2	F	122.5
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	D	31.1	C	21.9	D	31.6	C	22.2	D	34.9	C	23.7
	5 Kūhiō Hwy. / Kapule Hwy.	C	23.7	D	42.0	C	24.1	D	43.7	C	25.5	E	57.7
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	F	159.2	F	90.2	F	162.4	F	92.1	F	182.5	F	107.6
Ma'alo Rd.	1 Kūhiō Hwy. / 'Ehiku St.	See 'Ehiku Street Access Alternative				A	4.2	A	3.9	A	4.1	A	4.0
	2 Kūhiō Hwy. / Ma'alo Rd.					D	25.6	E	44.6	E	38.4	F	308.9
	3 Kūhiō Hwy. / Laulima St.					F	52.6	F	96.4	F	66.2	F	122.5
	4 Kūhiō Hwy. / Rob. Haw. Dwy.					D	31.6	C	22.2	D	34.9	C	23.7
	5 Kūhiō Hwy. / Kapule Hwy.					C	24.1	D	43.7	C	25.5	E	57.7
	6 Kūhiō Hwy. / Kaua'i Beach Dr.					F	162.4	F	92.1	F	182.5	F	107.6
Laulima St.	1 Kūhiō Hwy. / 'Ehiku St.	See 'Ehiku Street Access Alternative				A	4.2	A	3.9	A	4.1	A	4.0
	2 Kūhiō Hwy. / Ma'alo Rd.					C	24.8	E	40.2	D	27.0	E	47.7
	3 Kūhiō Hwy. / Laulima St.					F	58.9	F	105.4	F	161.0	F	415.2
	4 Kūhiō Hwy. / Rob. Haw. Dwy.					D	31.6	C	22.2	D	34.9	C	23.7
	5 Kūhiō Hwy. / Kapule Hwy.					C	24.1	D	43.7	C	25.5	E	57.7
	6 Kūhiō Hwy. / Kaua'i Beach Dr.					F	162.4	F	92.1	F	182.5	F	107.6
Roberts Hawaii	1 Kūhiō Hwy. / 'Ehiku St.	See 'Ehiku Street Access Alternative				A	4.2	A	3.9	A	4.1	A	4.0
	2 Kūhiō Hwy. / Ma'alo Rd.					C	24.8	E	40.2	D	27.0	E	47.7

Access Alternative	Intersection	Weekday Peak Hour							
		No Project				Project			
		AM		PM		Landfill		Landfill and RRP	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Dwy.	3 Kūhiō Hwy. / Lāulima St.	F	53.0	F	97.3	F	71.9	F	128.0
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	D	29.7	C	24.0	E	48.9	E	77.5
	5 Kūhiō Hwy. / Kapule Hwy.	C	24.1	D	43.7	C	25.5	E	57.7
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	F	162.4	F	92.1	F	182.5	F	107.6
Kaua'i Beach Dr.	1 Kūhiō Hwy. / 'Ehiku St.	A	4.2	A	3.9	A	4.1	A	4.0
	2 Kūhiō Hwy. / Ma'alo Rd.	C	24.8	E	40.2	D	27.0	E	47.7
	3 Kūhiō Hwy. / Lāulima St.	F	53.0	F	97.3	F	71.9	F	128.0
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	D	31.8	C	22.3	E	35.7	C	24.7
	5 Kūhiō Hwy. / Kapule Hwy.	C	24.2	D	43.6	C	28.8	D	45.9
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	F	214.1	F	98.5	F	---- ⁽¹⁾	F	183.2

Notes:

LOS and average delay for stop-controlled intersections represents the worst stop-controlled approach.

Bold indicates LOS E or LOS F.

⁽¹⁾ Volume exceeds capacity for the westbound Kaua'i Beach Drive approach.

Operations at each study intersection under each analysis scenario for the Opening Year are further summarized below.

2.2.3.1 INTERSECTION #1: KŪHIŌ HIGHWAY / 'EHIKU STREET (SIGNALIZED)

- *Opening Year Baseline:* Projected to operate at LOS A during both the weekday AM and PM peak hours.
- *Opening Year with Landfill:* No change in LOS under all access alternatives.
- *Opening Year with Landfill and RRP:* No change in LOS under all access alternatives.

Overall summary: This intersection would continue to operate at LOS A in the Opening Year under all analysis scenarios and all access alternatives.

2.2.3.2 INTERSECTION #2: KŪHIŌ HIGHWAY / MA'ALO ROAD (UNSIGNALIZED WITH ONE-WAY STOP CONTROL)

- *Opening Year Baseline:* Projected to operate at LOS C during the weekday AM peak hour, but LOS E during the weekday PM peak hour.
- *Opening Year with Landfill:* No change in LOS under all access alternatives except the Ma'alo Road Access Alternative. Under the Ma'alo Road Access Alternative, intersection operations would degrade to LOS D during the weekday AM peak hour, but remain at LOS E during the weekday PM peak hour (with a marginal increase in delay). The intersection would not satisfy the MUTCD peak-hour traffic signal warrant under any access alternative.
- *Opening Year with Landfill and RRP:* For all access alternatives except the Ma'alo Road Access Alternative, negligible change in LOS. The intersection would degrade to LOS D during the weekday AM peak hour, but remain at LOS E during the weekday PM peak hour. The intersection would not satisfy the MUTCD peak-hour traffic signal warrant.

Under the Ma'alo Road Access Alternative, intersection operations would degrade to LOS E during the weekday AM peak hour and LOS F during the weekday PM peak hour. The

intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour, and signalization is recommended.

Overall summary: In the Opening Year Baseline (without the Project), this intersection would operate at LOS C during the weekday AM peak hour and LOS E during the weekday PM peak hour, but would not satisfy the MUTCD peak-hour traffic signal warrant. Under all access alternatives except the Ma'alo Road Access Alternative the Project (regardless of whether or not the RRP component is included) would increase average delays, but intersection operations would generally remain similar to conditions without the Project, and the MUTCD peak-hour traffic signal warrant would not be satisfied.

Under the Ma'alo Road Access Alternative, the intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour with both the landfill and RRP, but not with the landfill only. As a result, signalization is recommended under the Ma'alo Road Access Alternative prior to the opening of the Project if the full build-out option (landfill plus RRP) is implemented, but not for the landfill-only option.

2.2.3.3 INTERSECTION #3: KŪHIŌ HIGHWAY / LAULIMA STREET (UNSIGNALIZED WITH TWO-WAY STOP CONTROL)

- *Opening Year Baseline:* Projected to operate at LOS F during both the weekday AM and PM peak hours. However, the intersection would not satisfy the MUTCD peak-hour traffic signal warrant during either peak hour.
- *Opening Year with Landfill:* No change in LOS under all access alternatives. The Project would result in a slight increase in average delays for all access alternatives except the Laulima Street Access Alternative, under which average delays would see a slightly larger increase. However, the intersection would not satisfy the MUTCD peak-hour traffic signal warrant under any access alternative.
- *Opening Year with Landfill and RRP:* No change in LOS under all access alternatives. For all access alternatives except the Laulima Street Access Alternative, the Project would result in a somewhat larger increase in average delays than with the landfill-only option. Under the Laulima Street Access Alternative, however, the Project would substantially increase average delays, and the intersection would satisfy the MUTCD peak-hour traffic signal warrant during both the weekday AM and PM peak hours. As a result, signalization is recommended under the Laulima Street Access Alternative.

Overall summary: In the Opening Year Baseline (without the Project), this intersection would operate at LOS F during both the weekday AM and PM peak hours, but would not satisfy the MUTCD peak-hour traffic signal warrant. Under all access alternatives except the Laulima Street Access Alternative, the Project (regardless of whether or not the RRP component is included) would increase average delays, but intersection operations would generally remain similar to conditions without the Project, and the MUTCD peak-hour traffic signal warrant would not be satisfied. Given the high levels of average delay, however, a full signal warrant analysis is recommended, including an evaluation of MUTCD four-hour and eight-hour vehicular volume traffic signal warrants.

Under the Laulima Street Access Alternative, the intersection would satisfy the MUTCD peak-hour traffic signal warrant during both the weekday AM and PM peak hours with both the landfill and RRP, but not with the landfill only. As a result, signalization is recommended under the Laulima Street Access Alternative prior to the opening of the Project if the full build-out option (landfill plus RRP) is implemented, but not for the landfill-only option.

2.2.3.4 INTERSECTION #4: KŪHIŌ HIGHWAY / ROBERTS HAWAII DRIVEWAY (UNSIGNALIZED WITH ONE-WAY STOP CONTROL)

- *Opening Year Baseline:* Projected to operate at LOS D during the weekday AM peak hour and LOS C during the weekday PM peak hour.
- *Opening Year with Landfill:* No change in LOS under all access alternatives.
- *Opening Year with Landfill and RRP:* For the 'Ehiku Street Access Alternative, Ma'alo Road Access Alternative, and Laulima Street Access Alternative, no change in LOS. For the Kaua'i Beach Drive Access Alternative, the intersection would degrade to LOS E during the weekday AM peak hour, but remain at LOS C during the weekday PM peak hour. The intersection would not satisfy the MUTCD peak-hour traffic signal warrant.

Under the Roberts Hawaii Driveway Access Alternative, intersection operations would degrade to LOS E during both the weekday AM and PM peak hours. The intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour, and signalization is recommended.

Overall summary: This intersection would operate at LOS D during the weekday AM peak hour and LOS C during the weekday PM peak hour in the Opening Year Baseline (without the Project). Under all access alternatives except the Roberts Hawaii Driveway Access Alternative, the Project (regardless of whether or not the RRP component is included) would increase average delays, but intersection operations would generally remain similar to conditions without the Project, and the MUTCD peak-hour traffic signal warrant would not be satisfied.

Under the Roberts Hawaii Driveway Access Alternative, the intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour with both the landfill and RRP, but not with the landfill only. As a result, signalization is recommended under the Roberts Hawaii Driveway Access Alternative prior to the opening of the Project if the full build-out option (landfill plus RRP) is implemented, but not for the landfill-only option.

2.2.3.5 INTERSECTION #5: KŪHIŌ HIGHWAY / KAPULE HIGHWAY (SIGNALIZED)

- *Opening Year Baseline:* Projected to operate at LOS C during the weekday AM peak hour and LOS D during the weekday PM peak hour.
- *Opening Year with Landfill:* No change in LOS under all access alternatives.
- *Opening Year with Landfill and RRP:* No change in LOS under the Kaua'i Beach Drive Access Alternative. Under the remaining access alternatives, intersection operations would remain at LOS C during the weekday AM peak hour, but degrade to LOS E during the weekday PM peak hour. This assumes, however, that the current signal timing and phasing plans are maintained.

Overall summary: This intersection would operate at LOS C during the weekday AM peak hour and LOS D during the weekday PM peak hour in the Opening Year Baseline (without the Project). Under the landfill-only option, the Project would slightly increase average delays, but intersection operations would generally remain similar to conditions without the Project. With both the landfill and RRP, intersection operations would degrade to LOS E during the weekday PM peak hour under all access alternatives except the Kaua'i Beach Drive Access Alternative. It is recommended that the signal timing and phasing plans be optimized in the future to improve operations.

2.2.3.6 INTERSECTION #6: KŪHIŌ HIGHWAY / KAUA'I BEACH DRIVE (UNSIGNALIZED WITH ONE-WAY STOP CONTROL)

- *Opening Year Baseline:* Projected to operate at LOS F during both the weekday AM and PM peak hours. The intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour, and signalization is recommended.
- *Opening Year with Landfill:* No change in LOS under all access alternatives. The Project would result in a slight increase in average delays for all access alternatives except the Kaua'i Beach Drive Access Alternative, under which average delays would see a slightly larger increase. The intersection would continue to satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour under all access alternatives, and signalization is recommended.
- *Opening Year with Landfill and RRP:* No change in LOS under all access alternatives. For all access alternatives except the Kaua'i Beach Drive Access Alternative, the Project would result in a somewhat larger increase in average delays than with the landfill-only option. Under the Kaua'i Beach Drive Access Alternative, however, the Project would substantially increase average delays. The intersection would continue to satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour under all access alternatives, and signalization is recommended.

Overall summary: This intersection would operate at LOS F during both the weekday AM and PM peak hours in in the Opening Year Baseline (without the Project), and would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour even without the Project. The Project would increase average delays, particularly under the Kaua'i Beach Drive Access Alternative, and the intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour (regardless of whether or not the RRP component is included). Therefore, further evaluation of the feasibility signalization by the Opening Year, regardless of Project implementation, is recommended for this intersection.

2.2.4 Future Long-Range Year

The estimated traffic generated by the proposed landfill and RRP in the Future Long-Range Year, summarized in Table 4, was added to the Future Long-Range year baseline traffic volumes to obtain anticipated traffic volumes for the Future Long-Range Year, both with and without the RRP. Operations at the six study intersections were evaluated for each scenario and access alternative using the Synchro 8.0 software package and the HCM methodology, as described in Section 2.1.3. Anticipated traffic volumes for each access alternative under these two Future Long-Range Year scenarios are included in Appendix A. The resulting LOS for the Future Long-Range Year with Landfill conditions and the Future Long-Range Year with Landfill and RRP conditions during both the weekday AM and PM peak hours is summarized in Table 6. Detailed LOS output summaries are included in Appendix B.

Table 6: Level of Service – Future Long-Range Year

Access Alternative	Intersection	Weekday Peak Hour											
		No Project				Project							
		AM		PM		Landfill			Landfill and RRP				
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay		
'Ehiku St.	1 Kūhiō Hwy. / 'Ehiku St.	A	5.5	A	5.3	A	6.0	A	6.1	A	7.3	B	11.5
	2 Kūhiō Hwy. / Ma'alo Rd.	E	35.0	F	126.8	E	35.8	F	133.6	E	39.6	F	177.8
	3 Kūhiō Hwy. / Laulima St.	F	206.3	F	422.1	F	219.8	F	442.0	F	286.6	F	544.9
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	E	48.6	D	31.3	E	49.9	D	31.9	F	55.8	D	34.5
	5 Kūhiō Hwy. / Kapule Hwy.	E	57.5	E	67.2	E	59.0	E	69.5	E	66.1	F	84.8
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	F	530.6	F	394.4	F	541.5	F	401.7	F	593.7	F	449.8
Ma'alo Rd.	1 Kūhiō Hwy. / 'Ehiku St.	<i>See 'Ehiku Street Access Alternative</i>				A	5.5	A	5.4	A	5.6	A	5.8
	2 Kūhiō Hwy. / Ma'alo Rd.					E	40.8	F	209.6	F	77.0	F	941.7
	3 Kūhiō Hwy. / Laulima St.					F	219.8	F	442.0	F	286.6	F	544.9
	4 Kūhiō Hwy. / Rob. Haw. Dwy.					E	49.9	D	31.9	F	55.8	D	34.5
	5 Kūhiō Hwy. / Kapule Hwy.					E	59.0	E	69.5	E	66.1	F	84.8
	6 Kūhiō Hwy. / Kaua'i Beach Dr.					F	541.5	F	401.7	F	593.7	F	449.8
Laulima St.	1 Kūhiō Hwy. / 'Ehiku St.	<i>See 'Ehiku Street Access Alternative</i>				A	5.5	A	5.4	A	5.6	A	5.8
	2 Kūhiō Hwy. / Ma'alo Rd.					E	36.0	F	135.0	E	39.8	F	191.8
	3 Kūhiō Hwy. / Laulima St.					F	267.9	F	487.3	F	655.8	F	— ⁽¹⁾
	4 Kūhiō Hwy. / Rob. Haw. Dwy.					E	49.9	D	31.9	F	55.8	D	34.5
	5 Kūhiō Hwy. / Kapule Hwy.					E	59.0	E	69.5	E	66.1	F	84.8
	6 Kūhiō Hwy. / Kaua'i Beach Dr.					F	541.5	F	401.7	F	593.7	F	449.8
Roberts Hawaii Dwy.	1 Kūhiō Hwy. / 'Ehiku St.	<i>See 'Ehiku Street Access Alternative</i>				A	5.5	A	5.4	A	5.6	A	5.8
	2 Kūhiō Hwy. / Ma'alo Rd.					E	36.0	F	135.0	E	39.8	F	191.8
	3 Kūhiō Hwy. / Laulima St.					F	223.4	F	445.9	F	310.1	F	567.0
	4 Kūhiō Hwy. / Rob. Haw. Dwy.					F	51.1	E	38.2	F	117.2	F	251.6
	5 Kūhiō Hwy. / Kapule Hwy.					E	59.0	E	69.5	E	66.1	F	84.8
	6 Kūhiō Hwy. / Kaua'i Beach Dr.					F	541.5	F	401.7	F	593.7	F	449.8
Kaua'i Beach Dr.	1 Kūhiō Hwy. / 'Ehiku St.	<i>See 'Ehiku Street Access Alternative</i>				A	5.5	A	5.4	A	5.6	A	5.8
	2 Kūhiō Hwy. / Ma'alo Rd.					E	36.0	F	135.0	E	39.8	F	191.8
	3 Kūhiō Hwy. / Laulima St.					F	223.4	F	445.9	F	310.1	F	567.0
	4 Kūhiō Hwy. / Rob. Haw. Dwy.					F	50.2	D	32.0	F	57.4	E	36.3
	5 Kūhiō Hwy. / Kapule Hwy.					E	59.4	E	69.4	E	69.6	E	71.7
	6 Kūhiō Hwy. / Kaua'i Beach Dr.					F	851.3	F	433.3	F	---- ⁽¹⁾	F	961.9

Notes:

LOS and average delay for stop-controlled intersections represents the worst stop-controlled approach.

Bold indicates LOS E or LOS F.

⁽¹⁾ Volume exceeds capacity for the westbound Kaua'i Beach Drive approach.

Operations at each study intersection under each analysis scenario for the Future Long-Range Year are summarized below.

2.2.4.1 INTERSECTION #1: KŪHIŌ HIGHWAY / 'EHIKU STREET (SIGNALIZED)

- *Future Long-Range Year Baseline:* Projected to operate at LOS A during both the weekday AM and PM peak hours.
- *Future Long-Range Year with Landfill:* No change in LOS under all access alternatives.
- *Future Long-Range Year with Landfill and RRP:* No change in LOS under all access alternatives.

Overall summary: This intersection would continue to operate at LOS A in the Future Long-Range Year under all analysis scenarios and all access alternatives.

2.2.4.2 INTERSECTION #2: KŪHIŌ HIGHWAY / MA'ALO ROAD (UNSIGNALIZED WITH ONE-WAY STOP CONTROL)

- *Future Long-Range Year Baseline:* Projected to operate at LOS E during the weekday AM peak hour and LOS F during the weekday PM peak hour, but would not satisfy the MUTCD peak-hour traffic signal warrant.
- *Future Long-Range Year with Landfill:* No change in LOS under all access alternatives. The Project would result in a slight increase in average delays for all access alternatives except the Ma'alo Road Access Alternative, under which average delays would see a slightly larger increase. The intersection would not satisfy the MUTCD peak-hour traffic signal warrant under any access alternative.
- *Future Long-Range Year with Landfill and RRP:* For all access alternatives except the Ma'alo Road Access Alternative, no change in LOS. The Project would result in a somewhat larger increase in average delays than with the landfill-only option, but the intersection would not satisfy the MUTCD peak-hour traffic signal warrant

Under the Ma'alo Road Access Alternative, the Project would substantially increase average delays. The intersection would degrade to LOS F during the weekday AM peak hour and satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour. As a result, signalization is recommended under the Ma'alo Road Access Alternative.

Overall summary: In the Future Year Baseline (without the Project), this intersection would operate at LOS E during the weekday AM peak hour and LOS F during the weekday PM peak hour, but would not satisfy the MUTCD peak-hour traffic signal warrant. Under all access alternatives except Route A, the Project (regardless of whether or not the RRP component is included) would increase average delays, but intersection operations would generally remain similar to conditions without the Project, and the MUTCD peak-hour traffic signal warrant would not be satisfied. Given the high levels of average delay, however, a full signal warrant analysis is recommended, including an evaluation of MUTCD four-hour and eight-hour vehicular volume traffic signal warrants.

Under the Ma'alo Road Access Alternative, the intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour with both the landfill and RRP, but not with the landfill only. As a result, signalization is recommended under the Ma'alo Road Access Alternative prior to the opening of the Project if the full build-out option (landfill plus RRP) is implemented, but not for the landfill-only option.

2.2.4.3 INTERSECTION #3: KŪHIŌ HIGHWAY / LAULIMA STREET (UNSIGNALIZED WITH TWO-WAY STOP CONTROL)

- *Future Long-Range Year Baseline:* Projected to operate at LOS F during both the weekday AM and PM peak hours. The intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday AM peak hour, and signalization is recommended.

- *Future Long-Range Year with Landfill:* No change in LOS under all access alternatives. The Project would result in a slight increase in average delays for all access alternatives except the Laulima Street Access Alternative, under which average delays would see a slightly larger increase. The intersection would continue to satisfy the MUTCD peak-hour traffic signal warrant during the weekday AM peak hour under all access alternatives, and signalization is recommended.
- *Future Long-Range Year with Landfill and RRP:* No change in LOS under all access alternatives. For all access alternatives except the Laulima Street Access Alternative, the Project would result in a somewhat larger increase in average delays than with the landfill-only option, and the intersection would continue to satisfy the MUTCD peak-hour traffic signal warrant during the weekday AM peak hour. Under the Laulima Street Access Alternative, the Project would substantially increase average delays, and the intersection would satisfy the MUTCD peak-hour traffic signal warrant during both the weekday AM and PM peak hours. Signalization is recommended under all access alternatives.

Overall summary: In the Future Long-Range Year without the Project, this intersection would operate at LOS F during both the weekday AM and PM peak hours, and would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour. Under all access alternatives except the Laulima Street Access Alternative, the Project (regardless of whether or not the RRP component is included) would increase average delays, but intersection operations would generally remain similar to conditions without the Project, and the MUTCD peak-hour traffic signal warrant would be satisfied during the weekday PM peak hour.

Under the Laulima Street Access Alternative, the intersection would satisfy the MUTCD peak-hour traffic signal warrant during both the weekday AM and PM peak hours with both the landfill and RRP, but during the weekday PM peak hour only under the landfill-only option.

Signalization is recommended by the Future Long-Range Year, regardless of whether the Project is implemented or not.

2.2.4.4 INTERSECTION #4: KŪHIŌ HIGHWAY / ROBERTS HAWAII DRIVEWAY (UNSIGNALIZED WITH ONE-WAY STOP CONTROL)

- *Future Long-Range Year Baseline:* Projected to operate at LOS E during the weekday AM peak hour and LOS D during the weekday PM peak hour, but would not satisfy the MUTCD peak-hour traffic signal warrant.
- *Future Long-Range Year with Landfill:* For the 'Ehiku Street Access Alternative, Ma'alo Road Access Alternative, and Laulima Street Access Alternative, no change in LOS. For the Kaua'i Beach Drive Access Alternative, the intersection would degrade to LOS F during the weekday AM peak hour, but remain at LOS D during the weekday PM peak hour. The intersection would not satisfy the MUTCD peak-hour traffic signal warrant.

Under the Roberts Hawaii Driveway Access Alternative, intersection operations would degrade to LOS F during the weekday AM peak hour and LOS E during the weekday PM peak hour, but the intersection would not satisfy the MUTCD peak-hour traffic signal warrant during either peak hour.

- *Future Long-Range Year with Landfill and RRP:* For the 'Ehiku Street Access Alternative, Ma'alo Road Access Alternative, and Laulima Street Access Alternative, the intersection would degrade to LOS F during the weekday AM peak hour, but remain at LOS D during the weekday PM peak hour. For the Kaua'i Beach Drive Access Alternative, the intersection would degrade to LOS F during the weekday AM peak hour and LOS E during the weekday PM peak hour. The intersection would not satisfy the MUTCD peak-hour traffic signal warrant.

Under the Roberts Hawaii Driveway Access Alternative, intersection operations would degrade to LOS F during both the weekday AM and PM peak hours. The intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour, and signalization is recommended.

Overall summary: In the Future Long-Range Year without the Project, this intersection would operate at LOS E during the weekday AM peak hour and LOS D during the weekday PM peak hour, but would not satisfy the MUTCD peak-hour traffic signal warrant. Under all access alternatives except the Roberts Hawaii Driveway Access Alternative, the Project (regardless of whether or not the RRP component is included) would increase average delays, but intersection operations would generally remain similar to conditions without the Project, and the MUTCD peak-hour traffic signal warrant would not be satisfied.

Under the Roberts Hawaii Driveway Access Alternative, the intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour with both the landfill and RRP, but not with the landfill only. As a result, signalization is recommended under the Roberts Hawaii Driveway Access Alternative prior to the opening of the Project if the full build-out option (landfill plus RRP) is implemented, but not for the landfill-only option.

2.2.4.5 INTERSECTION #5: KŪHIŌ HIGHWAY / KAPULE HIGHWAY (SIGNALIZED)

- *Future Long-Range Year Baseline:* Projected to operate at LOS E during both the weekday AM and PM peak hours.
- *Future Long-Range Year with Landfill:* No change in LOS under all access alternatives.
- *Future Long-Range Year with Landfill and RRP:* No change in LOS under the Kaua'i Beach Drive Access Alternative. Under the remaining access alternatives, intersection operations would remain at LOS E during the weekday AM peak hour, but degrade to LOS F during the weekday PM peak hour. This assumes, however, that the current signal timing and phasing plans are maintained.

Overall summary: This intersection would operate at LOS E during both the weekday AM and PM peak hours in the Future Long-Range Year Baseline (without the Project). Under the landfill-only option, the Project would slightly increase average delays, but intersection operations would generally remain similar to conditions without the Project. With both the landfill and RRP, intersection operations would degrade to LOS F during the weekday PM peak hour under all access alternatives except Route E. It is recommended that the signal timing and phasing plans be optimized to improve operations.

2.2.4.6 INTERSECTION #6: KŪHIŌ HIGHWAY / KAUA'I BEACH DRIVE (UNSIGNALIZED WITH ONE-WAY STOP CONTROL)

- *Future Long-Range Year Baseline:* Projected to operate at LOS F during both the weekday AM and PM peak hours. The intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour, and signalization is recommended.
- *Future Long-Range Year with Landfill:* No change in LOS under all access alternatives. The Project would result in a slight increase in average delays for all access alternatives except the Kaua'i Beach Drive Access Alternative, under which average delays would see a slightly larger increase. The intersection would continue to satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour under all access alternatives, and signalization is recommended.
- *Future Long-Range Year with Landfill and RRP:* No change in LOS under all access alternatives. For all access alternatives except the Kaua'i Beach Drive Access Alternative,

the Project would result in a somewhat larger increase in average delays than with the landfill-only option. Under the Kaua'i Beach Drive Access Alternative, however, the Project would substantially increase average delays. The intersection would continue to satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour under all access alternatives, and signalization is recommended.

Overall summary: In the Future Long-Range Year without the Project, this intersection would operate at LOS F during both the weekday AM and PM peak hours, and would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour. The Project would increase average delays, particularly under the Kaua'i Beach Drive Access Alternative, and the intersection would satisfy the MUTCD peak-hour traffic signal warrant during the weekday PM peak hour (regardless of whether or not the RRP component is included). Therefore, further evaluation of the feasibility signalization by the Future Long-Range Year, regardless of Project implementation, is recommended for this intersection.

2.3 TRAFFIC ASSESSMENT RECOMMENDATIONS

2.3.1 Traffic Impact Minimization

As summarized in Table 7, Access Route B is the access route expected to generate the fewest adverse impacts to traffic operations at the study highway intersections. Although in some cases the average delay on the minor-street approaches would be substantial, they may still not satisfy the MUTCD peak-hour traffic signal warrant under some of the analysis scenarios, because traffic volumes on the minor-street approach would not meet the thresholds. Further evaluation of MUTCD traffic signal warrants (particularly the four-hour and eight-hour vehicular volume warrants) would be required, and is recommended, to determine if a signal could be warranted at these locations.

Table 7: Summary of Findings – 'Ehiku Street Access Alternative

Intersection		Opening Year (2020)	Future Year (2040)
1	Kūhiō Highway / 'Ehiku Street	<ul style="list-style-type: none"> No impact 	<ul style="list-style-type: none"> No impact
2	Kūhiō Highway / Ma'alo Road	<ul style="list-style-type: none"> No signalization required, even under full project build-out 	<ul style="list-style-type: none"> Further evaluation of signal warrants recommended
3	Kūhiō Highway / Laulima Street	<ul style="list-style-type: none"> Further evaluation of signal warrants recommended 	<ul style="list-style-type: none"> Signalization recommended, with or without Project
4	Kūhiō Highway / Roberts Hawaii Driveway	<ul style="list-style-type: none"> No signalization required, even under full project build-out 	<ul style="list-style-type: none"> No signalization required, even under full project build-out
5	Kūhiō Highway / Kapule Highway	<ul style="list-style-type: none"> Signal timing / phasing optimization recommended 	<ul style="list-style-type: none"> Signal timing / phasing optimization recommended
6	Kūhiō Highway / Kaua'i Beach Drive	<ul style="list-style-type: none"> Signalization recommended, with or without Project 	<ul style="list-style-type: none"> Signalization recommended, with or without Project

2.3.2 Recommended Improvement Measures

Because traffic impacts are only one criterion for choosing between the proposed access alternatives, and other concerns may ultimately outweigh the incremental increase in traffic delays (which, in many cases, are not expected to be very significant), a different access route may ultimately be chosen as part of the proposed project. Therefore, recommended improvements at each study intersection have been developed for all access routes; these improvements are summarized in Table 8 and further developed in Section 3.0.

Table 8: Recommended Intersection Improvements by Access Alternative

Access Alternative	Intersection	Existing Traffic Control	Recommended Improvement					
			Opening Year (2020)			Future Year (2040)		
			No Project	Project		No Project	Project	
				Landfill	Landfill and RRP		Landfill	Landfill and RRP
'Ehiku St.	1 Kūhiō Highway / 'Ehiku Street	Signal	N	N	N	N	N	N
	2 Kūhiō Highway / Ma'alo Road	OWSC	N	N	N	E	E	E
	3 Kūhiō Highway / Laulima Street	TWSC	E	E	E	S	S	S
	4 Kūhiō Highway / Roberts Hawaii Dwy.	OWSC	N	N	N	N	N	N
	5 Kūhiō Highway / Kapule Highway	Signal	N	N	O	O	O	O
	6 Kūhiō Highway / Kaua'i Beach Drive	OWSC	S	S	S	S	S	S
Ma'alo Rd.	1 Kūhiō Highway / 'Ehiku Street	Signal	N	N	N	N	N	N
	2 Kūhiō Highway / Ma'alo Road	OWSC	N	N	S	E	E	S
	3 Kūhiō Highway / Laulima Street	TWSC	E	E	E	S	S	S
	4 Kūhiō Highway / Roberts Hawaii Dwy.	OWSC	N	N	N	N	N	N
	5 Kūhiō Highway / Kapule Highway	Signal	N	N	O	O	O	O
	6 Kūhiō Highway / Kaua'i Beach Drive	OWSC	S	S	S	S	S	S
Laulima St.	1 Kūhiō Highway / 'Ehiku Street	Signal	N	N	N	N	N	N
	2 Kūhiō Highway / Ma'alo Road	OWSC	N	N	N	E	E	E
	3 Kūhiō Highway / Laulima Street	TWSC	E	E	S	S	S	S
	4 Kūhiō Highway / Roberts Hawaii Dwy.	OWSC	N	N	N	N	N	N
	5 Kūhiō Highway / Kapule Highway	Signal	N	N	O	O	O	O
	6 Kūhiō Highway / Kaua'i Beach Drive	OWSC	S	S	S	S	S	S
Roberts Hawaii Dwy.	1 Kūhiō Highway / 'Ehiku Street	Signal	N	N	N	N	N	N
	2 Kūhiō Highway / Ma'alo Road	OWSC	N	N	N	E	E	E
	3 Kūhiō Highway / Laulima Street	TWSC	E	E	E	S	S	S
	4 Kūhiō Highway / Roberts Hawaii Dwy.	OWSC	N	N	S	N	E	S
	5 Kūhiō Highway / Kapule Highway	Signal	N	N	O	O	O	O
	6 Kūhiō Highway / Kaua'i Beach Drive	OWSC	S	S	S	S	S	S
Kaua'i Beach Dr.	1 Kūhiō Highway / 'Ehiku Street	Signal	N	N	N	N	N	N
	2 Kūhiō Highway / Ma'alo Road	OWSC	N	N	N	E	E	E
	3 Kūhiō Highway / Laulima Street	TWSC	E	E	E	S	S	S
	4 Kūhiō Highway / Roberts Hawaii Dwy.	OWSC	N	N	N	N	N	N
	5 Kūhiō Highway / Kapule Highway	Signal	N	N	N	O	O	O
	6 Kūhiō Highway / Kaua'i Beach Drive	OWSC	S	S	S	S	S	S

Notes:

OWSC = One-way stop control

TWSC = Two-way stop control

Recommended improvements key:

- N None (no improvements required)
- E Further evaluation of signal warrants (MUTCD peak-hour traffic signal warrant not met, but high average delays may warrant signalization)
- S Signalization (MUTCD peak-hour traffic signal warrant met)
- O Signal timing / phasing optimization

Table 9 summarizes the anticipated improvements to the projected traffic impacts and LOS that the Recommended Improvement Measures would achieve, based on an analysis of the weekday PM peak hour for the full build-out of the Project (landfill and RRP), assuming that those intersections recommended for further evaluation of signal warrants would in fact be signalized. A complete analysis of the MUTCD traffic signal warrants, including the four-hour and eight-hour vehicular

volume warrants, should be conducted to determine whether a traffic signal should be installed, based either on MUTCD traffic signal warrants or in order to improve pedestrian and/or bicycle connections and safety.

Table 9: Level of Service – With Improvements

Access Alternative	Intersection	Opening Year (2020) plus Landfill and RRP Conditions			Future Year (2040) plus Landfill and RRP Conditions		
		Improvement	LOS		Improvement	LOS	
			Before	After		Before	After
'Ehiku St.	1 Kūhiō Hwy. / 'Ehiku St.	None			None		
	2 Kūhiō Hwy. / Ma'alo Rd.	None			Signalization	F	A
	3 Kūhiō Hwy. / Laulima St.	Signalization	F	A	Signalization	F	A
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	None			None		
	5 Kūhiō Hwy. / Kapule Hwy.	Signal optimization	E	C	Signal optimization	F	C
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	Signalization	F	A	Signalization	F	B
Ma'alo Rd.	1 Kūhiō Hwy. / 'Ehiku St.	None			None		
	2 Kūhiō Hwy. / Ma'alo Rd.	Signalization	F	A	Signalization	F	B
	3 Kūhiō Hwy. / Laulima St.	Signalization	F	A	Signalization	F	A
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	None			None		
	5 Kūhiō Hwy. / Kapule Hwy.	Signal optimization	E	C	Signal optimization	F	C
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	Signalization	F	A	Signalization	F	B
Laulima St.	1 Kūhiō Hwy. / 'Ehiku St.	None			None		
	2 Kūhiō Hwy. / Ma'alo Rd.	None			Signalization	F	A
	3 Kūhiō Hwy. / Laulima St.	Signalization	F	B	Signalization	F	B
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	None			None		
	5 Kūhiō Hwy. / Kapule Hwy.	Signal optimization	E	C	Signal optimization	F	C
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	Signalization	F	A	Signalization	F	B
Roberts Hawaii Dwy.	1 Kūhiō Hwy. / 'Ehiku St.	None			None		
	2 Kūhiō Hwy. / Ma'alo Rd.	None			Signalization	F	A
	3 Kūhiō Hwy. / Laulima St.	Signalization	F	A	Signalization	F	A
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	Signalization	E	A	Signalization	F	B
	5 Kūhiō Hwy. / Kapule Hwy.	Signal optimization	E	C	Signal optimization	F	C
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	Signalization	F	A	Signalization	F	B
Kaua'i Beach Dr.	1 Kūhiō Hwy. / 'Ehiku St.	None			None		
	2 Kūhiō Hwy. / Ma'alo Rd.	None			Signalization	F	A
	3 Kūhiō Hwy. / Laulima St.	Signalization	F	A	Signalization	F	A
	4 Kūhiō Hwy. / Rob. Haw. Dwy.	None			None		
	5 Kūhiō Hwy. / Kapule Hwy.	None			Signal optimization	E	C
	6 Kūhiō Hwy. / Kaua'i Beach Dr.	Signalization	F	B	Signalization	F	D

Notably, because of the relatively low amount of traffic volume generated by the MSWLF during the peak hours, the differences between the Baseline scenarios (future traffic growth without the project) and the Baselines plus the MSWLF are minor. This indicates that a scenario without the RRP (or with minimal RRP implementation) would have minor impacts on traffic operations at the intersections evaluated; as shown in Table 9, in most cases, the LOS is not expected to be impacted by the operation of the MSWLF only). This applies to all access scenarios and both AM and PM time periods.

2.4 TRAFFIC ASSESSMENT CONCLUSION

Intersection operation is not the only factor in evaluating the alternative access routes. If it were the only factor, then Access Route B would be recommended because the existing traffic signal at that intersection would allow it to accommodate the traffic generated by the MSWLF and the RRP with the least need for traffic mitigation. However, countervailing factors are present:

- **Route A.** Routes using the Ma'alo Road / Kūhiō Highway intersection for highway access would trigger signalization at the intersection in the ultimate development scenario. However, these routes come with a requirement for extensive improvements to both Ma'alo Road and the Ma'alo Road / Kūhiō Highway intersection, making Route A very expensive. Especially during interim phases of the proposed project, when this intersection is expected to be operating as an unsignalized intersection, caution should be exercised in introducing additional large vehicles at this location.
- **Route B.** The routes using 'Ehiku Street as the primary access to/from Kūhiō Highway would require extensive and costly improvements. The 'Ehiku Street / Kūhiō Highway intersection is located in a part of Līhu'e that has multiple active driveway accesses and is relatively close to the Ahukini Road / Kūhiō Highway intersection that was observed to queue toward the 'Ehiku Street / Kūhiō Highway intersection during the AM peak hour. Finally, the segment of 'Ehiku Street between Kūhiō Highway and Kānālohu Street has direct residential driveway access on it, raising issues of safety and quality of life impacts to the adjacent properties.
- **Route C.** Using the Lāulima Street / Kūhiō Highway intersection for highway access would trigger signalization of this intersection in the ultimate development scenario. With appropriate intersection improvements, this route would provide acceptable intersection operations and the most direct access route to the proposed project site. A benefit of this alternative is that it would help this intersection warrant traffic signalization earlier than other alternatives. This intersection currently experiences significant delay for traffic turning out of the subdivision during peak traffic hours. However, the traffic volumes on Lāulima Street do not currently warrant traffic signalization. Helping this intersection warrant signalization sooner would enable this intersection to be signalized, significantly lessening the delay currently experienced by traffic turning out of Lāulima Street.
- **Route D.** Using the Roberts Hawaii Driveway / Kūhiō Highway intersection for highway access would trigger signalization of this intersection in the ultimate development scenario. With appropriate intersection improvements, this route would provide acceptable intersection operations and the second-most-direct access route to the proposed project site, while directing some traffic away from the core of Hanamā'ulu. Selection of this alternative would warrant traffic signalization, and signalization would be included as part of the intersection improvements. Due to the proximity of the signalized Kapule Highway / Kūhiō Highway intersection, traffic signals at the Roberts Hawaii Driveway and Kapule Highway intersections would need to be interconnected and coordinated.
- **Route E.** Using the Kaua'i Beach Driveway / Kūhiō Highway intersection for highway access would trigger signalization of this intersection in the ultimate development scenario. With appropriate intersection improvements, this route would provide acceptable intersection operations and the third-most-direct access route to the proposed project site, while directing some traffic away from the core of Hanamā'ulu, as requested by local residents. Recommended improvements for this alternative include traffic signalization, which is currently warranted. The traffic signal would also benefit existing traffic turning out of the Kaua'i Beach Driveway by significantly reducing delay and increasing safety. Due to the proximity of the signalized Kapule Highway / Kūhiō Highway intersection, traffic signals on Kūhiō Highway at the Kaua'i Beach Driveway and Kapule Highway intersections would need to be interconnected and coordinated.

In conclusion, while Route B would be expected to generate the fewest traffic impacts, overall, Route C, D, or E may provide the most cost-effective and efficient access to the MSWLF/RRP site, while minimizing impacts to the traffic operations and adjacent land uses.

3.0 INFRASTRUCTURE IMPROVEMENTS ASSESSMENT

3.1 INTRODUCTION AND PURPOSE

This infrastructure improvements assessment provides conceptual analysis of access route alternatives from Kūhiō Highway to the proposed project. The analysis evaluates the existing conditions, recommends improvements to the access routes, provides permitting, land use or land acquisition requirements and the estimated processing time, and presents planning-level cost estimates. The potential access routes analyzed in this section are as follows (see Figure 4):

- Route A1 & A2: via Ma'alo Road (Section 3.3)
- Route B1 & B2: via 'Ehiku Street (Section 3.4)
- Route C3: via Laulima Street (Section 3.5)
- Route D3: via Roberts Hawaii Driveway (Section 3.6)
- Route E3: via Kaua'i Beach Drive (Section 3.7)

3.2 UTILITY CONNECTIONS

Development of the selected project access route would also include utility corridor improvements, including relocation and connection to existing facilities as well as establishment of new facilities (i.e., along the driveway). Existing infrastructure in the vicinity of each route is presented in the following subsections.

3.2.1 Water

The Līhu'e Water system in Hanamā'ulu has two known water storage tanks, a 500,000-gallon concrete tank, and a 1.0-million-gallon (MG) concrete tank, that provide water along Kūhiō Highway and Ma'alo Road. The 500,000-gallon tank is located along Laulima Street about ¼ mile mauka of Kūhiō Highway. The 1.0-MG concrete tank is located along Kulei Road approximately ½ mile mauka of Kūhiō Highway and provides water for a 12-inch water main along Kūhiō Highway and a 16-inch water main along Ma'alo Road. Based on this preliminary analysis, a new 12-inch water main with a small booster pump station would be sufficient to meet the assumed domestic average project daily demand of 2,760 gallons per day (gpd), the required fire flow, and other County of Kaua'i Department of Water criteria. It is also assumed that the existing water system has enough capacity, storage, and well supply to handle the proposed project water demand, and would not require upgrades. Upon selection of the proposed route, further analysis will be required to confirm these assumptions, which may include consultation with the County of Kaua'i Department of Water.

3.2.2 Wastewater

The sewage collection system in the Līhu'e and Hanamā'ulu area flow to the Līhu'e Sewage Treatment Plant located just south of the Līhu'e Airport, approximately 5 miles from the project site. Based on this preliminary analysis, a new 8-inch sewer main would be adequate to handle the additional proposed average project daily flow of 2,200 gpd. It is assumed that the existing downstream sewage infrastructure, including sewer mains and the Kapaia Sewer Pump Station, has adequate capacity to handle the additional flows from the project site and does not require any upgrades. Upon selection of the proposed route, further analysis would be required to confirm the assumptions, which may include consultation with the County of Kaua'i Department of Public Works.

However, due to the distance between the project site and the existing sewer line points of connection, a more cost-effective alternative is to install onsite individual wastewater systems comprised of septic tanks and absorption beds. Additional environmental clearances and permitting would be required for this option; however, no problems are anticipated in obtaining the required approvals. This option would cost approximately \$220,000 regardless of which access route is

chosen, and is not included in the access route cost estimates presented herein (because it will be accounted for in the design of the facilities, in a separate report).

3.2.3 Electric Power and Telephone Service

Overhead electric power and telephone service is available at Ma'alo Road and along Kūhiō Highway. Along Ma'alo and 'Ehiku Roads, the existing poles would require relocating to accommodate road widening. Service along routes C and D would have to be established along the entire access routes.

3.3 MA'ALO ROAD ACCESS (ROUTES A1 AND A2)

3.3.1 Existing Conditions and Improvements

The Ma'alo Road access routes are shown on Figure 4. The routes start at the Ma'alo Road / Kūhiō Highway intersection and split near the proposed RRP site at the intersection of Driveways 1 and 2:

- Route A1 uses Driveway 1 to provide a direct route to the MSWLF, crossing two corrugated pipe culverts located in offsite wetland areas.
- Route A2 follows Driveway 1 to the intersection where Driveway 2 commences and bypasses the culverts and wetlands.

3.3.1.1 MA'ALO ROAD ROADWAY IMPROVEMENTS

Ma'alo Road is under State jurisdiction. The typical section through this area consists of two paved 10-ft lanes and 3-ft unimproved shoulders (Figure 5). Existing guardrails along the access route were observed during a site visit. The existing road includes a bridge and crosses nine existing culverts before reaching the intersection with Driveways 1 and 2. The Right-Of-Way (ROW) is 60 ft wide. The existing pavement section could not be found from as-built records.

Proposed improvements to Ma'alo Road, which conform to the requirements of the American Association of State Highway and Transportation Officials (AASHTO) and State of Hawai'i Department of Transportation (DOT), are:

- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches asphalt concrete pavement (ACP), 6 inches asphalt concrete base (ACB), 6 inches aggregate subbase
- Reconstruct existing culverts
- Relocate guardrails

3.3.1.2 MA'ALO ROAD UTILITY IMPROVEMENTS

Along routes A1 and A2, the nearest water connection is the 16-inch main along Ma'alo Road, where electricity and telephone service are also available. Recommended utility improvements to Ma'alo Road are:

- Relocate power and telephone poles along Ma'alo Road to accommodate road widening
- Connect water to Driveway 1 and 2
- Relocate 2-inch waterline along Ma'alo Road
- Relocate backflow preventer, fire hydrant, drain inlet, etc.
- Reconstruct existing culverts

Path: \\Honolulu\Honolulu\Projects\Legacy\ENV\Non-Federal\County of Kauai\60221907 KAUAI-New Landfill\09_GIS\02_Maps\10_TREES\01_MXD\Figure 4 - Locations of infrastructure improvements for potential access routes rev1.mxd

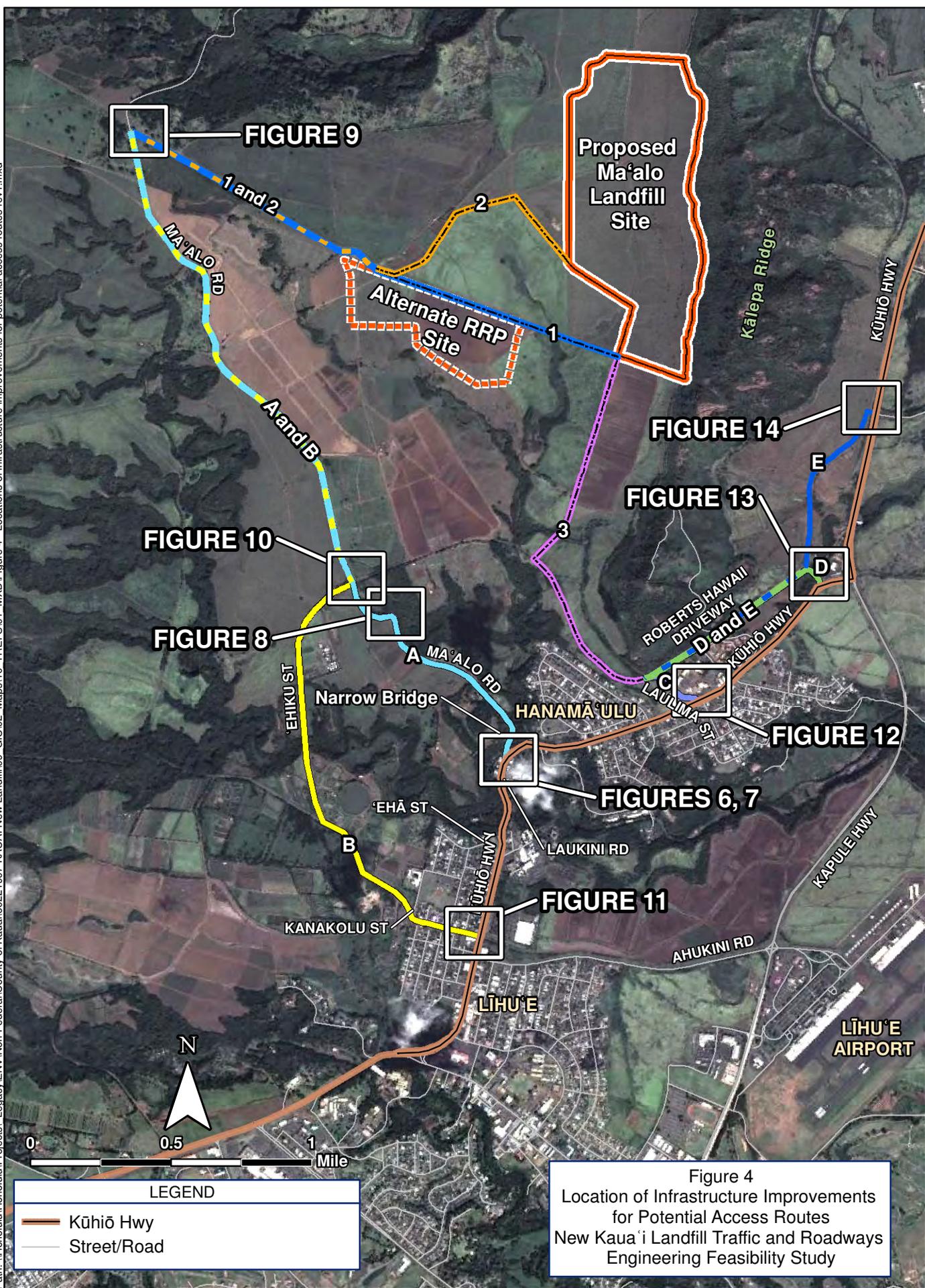
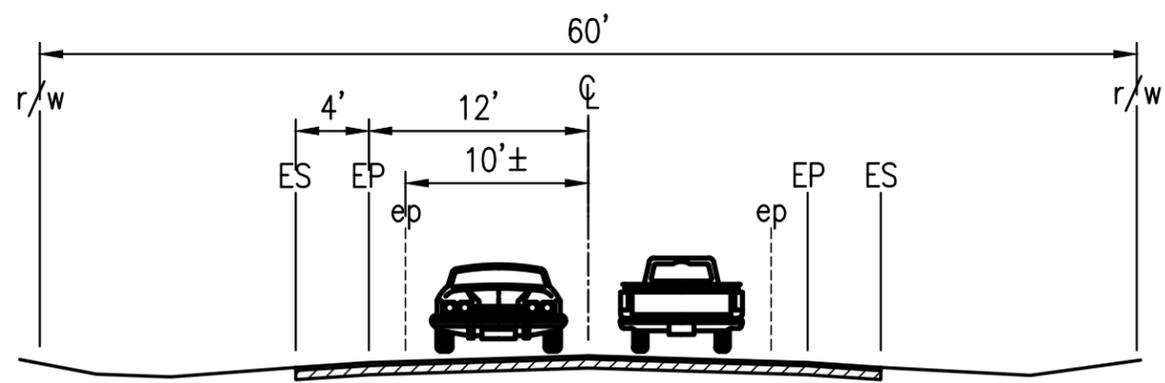
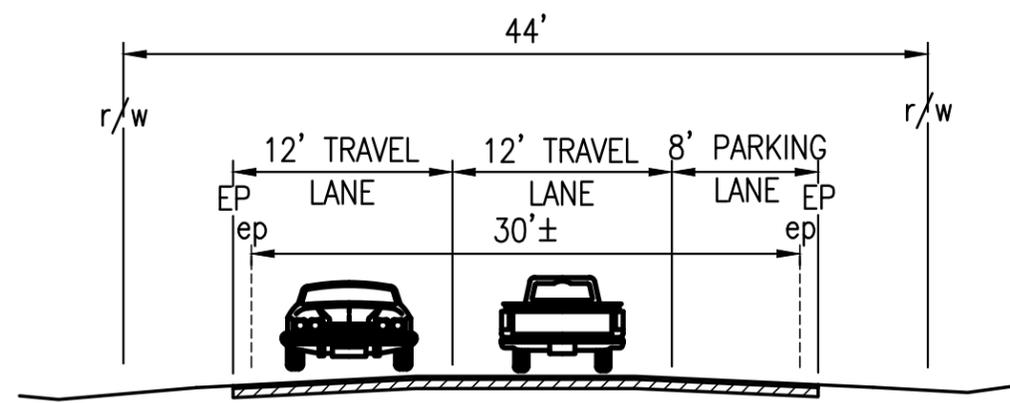


Figure 4
Location of Infrastructure Improvements
for Potential Access Routes
New Kaua'i Landfill Traffic and Roadways
Engineering Feasibility Study

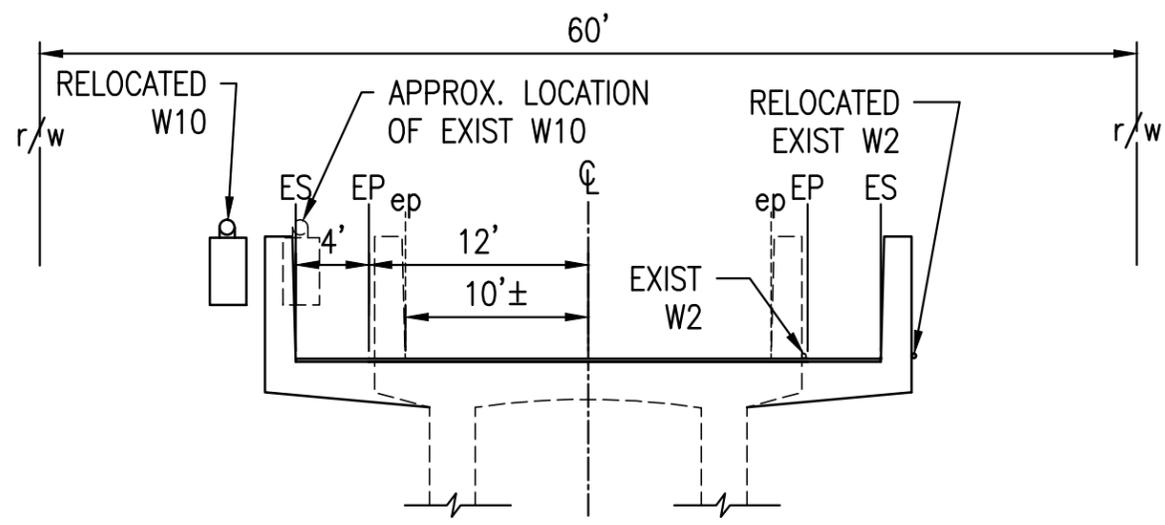
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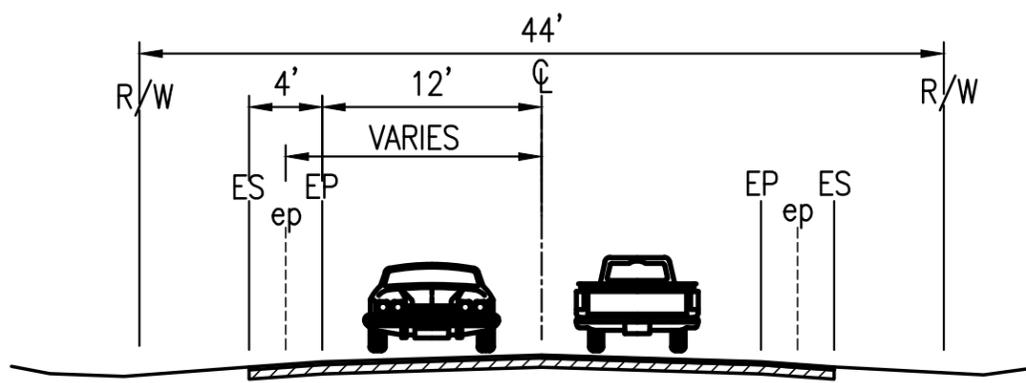
TYPICAL SECTION FOR MAALO ROAD



TYPICAL SECTION FOR EHIKU STREET FROM ELIMA STREET TO KANAKOLU STREET



TYPICAL SECTION FOR MAALO ROAD BRIDGE



TYPICAL SECTION FOR LAULIMA STREET, ROBERT'S HAWAII DRIVEWAY ACCESS, DRIVEWAYS "1", "2" & "3", AND EHIKU STREET FROM KANAKOLU STREET TO MAALO ROAD

NOTES
 SOURCE: HDOT PROJ. NO. ARR-0583(1) 2009, GOOGLE EARTH
 DATE: 10-10-2013
 DRAWN BY: AT (AECOM)



LIST OF ABBREVIATIONS:

- ℄ CENTER LINE OF ROADWAY
- ep EXISTING EDGE OF PAVEMENT
- ecls existing center line striping
- EP PROPOSED EDGE OF PAVEMENT
- ES PROPOSED EDGE OF SHOULDER
- r/w EXISTING RIGHT OF WAY
- R/W PROPOSED RIGHT OF WAY

Figure 5
Typical Sections
New Kaua'i Landfill Traffic and Roadways
Engineering Feasibility Study

3.3.1.3 MA'ALO ROAD / KŪHIŌ HIGHWAY INTERSECTION

The Ma'alo Road / Kūhiō Highway intersection is a 3-way, unsignalized intersection with a left-turn lane in the northbound direction on Kūhiō Highway. The State DOT ROW is 60 ft wide. The Kapaia Bridge (Kūhiō Highway) is just east of the intersection and has a travelway width of 24 ft. The existing intersection can accommodate truck-turning movements for a WB-40 design vehicle. The existing pavement sections could not be found from as-built records.

Based on initial consultation, the State DOT suggested providing a right-turn deceleration lane southbound on Kūhiō Highway to Ma'alo Road, and a median lane for left turns onto Kūhiō Highway northbound. The proposed intersection layout is shown on Figure 6. The right turn lane provides taper and storage that meets the AASHTO design criteria for a design speed of 35 miles per hour.

Proposed improvements to the Ma'alo Road / Kūhiō Highway intersection are:

- Signalize intersection
- Widen roads and pave: 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
 - Right-turn from Kūhiō Highway southbound onto Ma'alo Road:
Increase turning radius to 40 feet to accommodate large vehicles
- Install guardrail and end treatment
- Fill and grade along Kūhiō Highway sloped shoulder
- Construct retaining wall (approximately 3 ft tall) along Kūhiō Highway due to slope fill
- Relocate utility poles, fire hydrant, backflow preventer, drain inlet, culvert
- Acquire additional ROW (including survey maps)

Upon completion of these improvements, all turning movements at the proposed intersection will accommodate the WB-40 design vehicle.

Widening of the Kapaia Bridge on Kūhiō Highway may be necessary if the State DOT requires a deceleration lane for the intersection, in lieu of the above-proposed taper and storage. The existing bridge was built in 1932 and is approximately 30 feet wide with a 160-ft span. An additional 14-ft deceleration lane and 5-ft pedestrian walkway would require approximately 3,000 square feet of new bridge deck and structural support. ROW acquisition will also be required. A coordination meeting should be set up with State DOT to discuss the current bridge structural rating and feasibility of replacing the entire bridge. The proposed bridge widening is shown on Figure 7, and is conservatively included in the cost estimate for Route A.

A roundabout is an alternative that could conceivably be used at the Ma'alo Road / Kūhiō Highway intersection. Benefits of a roundabout include improved safety, reduced speeds, and decreased traffic congestion. Negative aspects of a roundabout include user unfamiliarity with roundabouts and the equal-priority status of all approaches, which can slow through traffic. Land requirements for a roundabout would be an issue of particular concern at this location, as a single-lane roundabout would require an inscribed circle diameter of 105–150 ft to accommodate a WB-40 design vehicle. Lane width for the roundabout is typically 16–20 ft, resulting in an outside diameter of 120–170 ft for a roundabout at this intersection—this would require substantial ROW acquisition. Due primarily to land acquisition issues and the geometry of the area, a roundabout is not recommended and has been eliminated from further consideration. If a single-lane roundabout is desired, then further analysis would be required.

3.3.1.4 EXISTING BRIDGE ON MA'ALO ROAD

The existing bridge on Ma'alo Road just north of the Ma'alo Road / Kūhiō Highway intersection is 20 ft wide with 10-ft lanes and no shoulders. The ROW is 60 ft wide.

The proposed typical section of the bridge is presented on Figure 5.

Proposed improvements to the existing bridge on Ma'alo Road are:

- Widen bridge (32 ft clear width)
 - It is assumed at this stage that there are no issues with widening the bridge; e.g., historical preservation review or requirements.
 - Bridge repaving: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Relocate 2-inch waterline strapped to side of bridge
- Relocate 12-inch waterline crossing adjacent to bridge

3.3.1.5 EXISTING SHARP CURVE ALONG MA'ALO ROAD

A sharp curve exists along Ma'alo Road, as shown on Figure 8. This curve will not accommodate the WB-40 design vehicle. The existing typical section through this area consists of two 10-ft lanes with 3-ft unimproved shoulders. The ROW is 60 ft wide.

This stretch would be excavated as necessary, re-graded, and a reverse curve established. Figure 8 shows the proposed road widening in this area. Proposed improvements to the existing sharp curve along Ma'alo Road are:

- Acquire additional ROW
- Excavate and grade

The cost of paving this area is captured under Section 3.3.1.1.

3.3.1.6 MA'ALO ROAD / DRIVEWAYS 1 AND 2 INTERSECTION

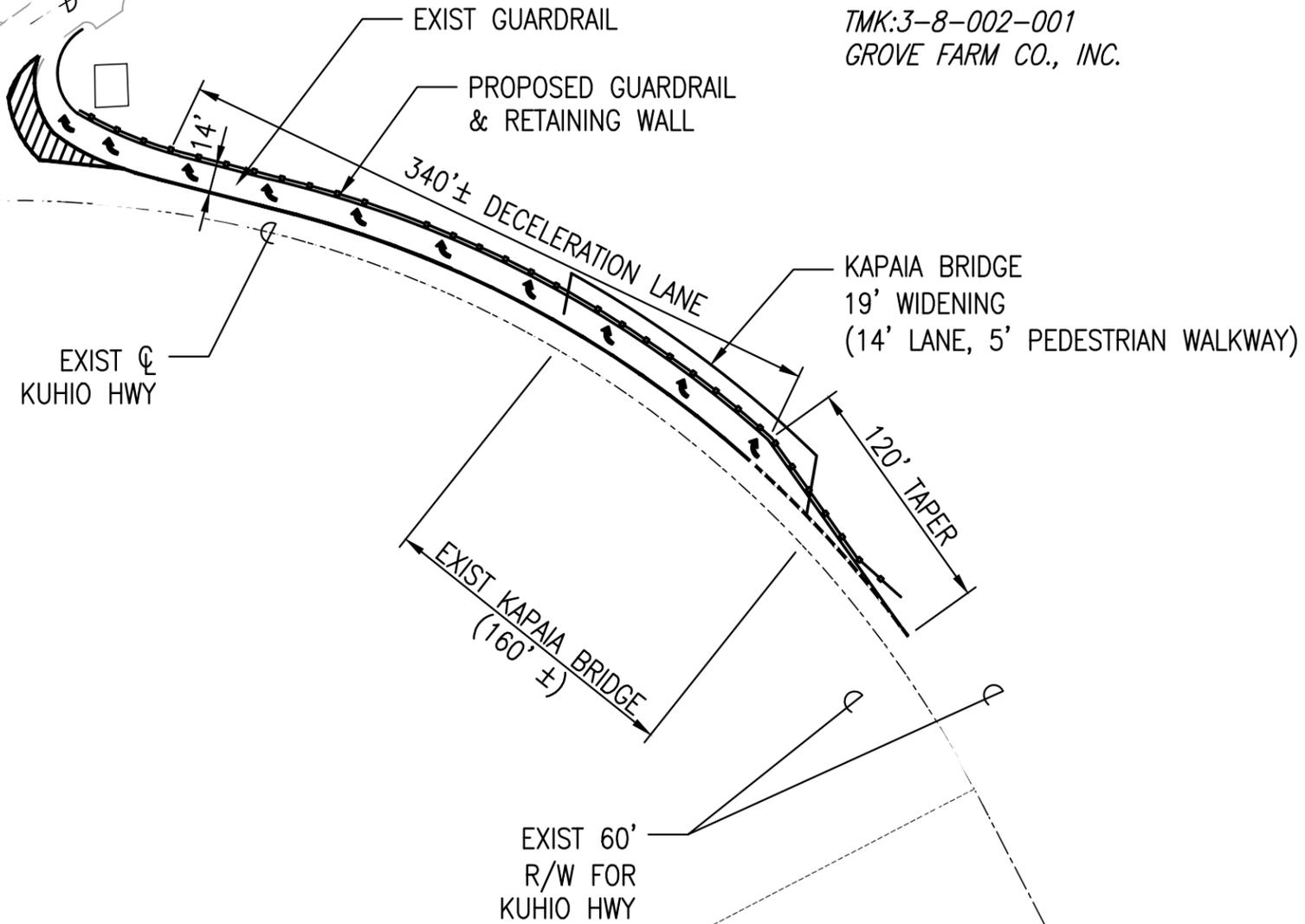
A sharp right turn exists northbound on Ma'alo Road at the intersection with Driveways 1 and 2, as shown on Figure 9. This curve will not accommodate the WB-40 design vehicle. Ma'alo Road currently has 10-ft lanes and 3-ft unpaved shoulders at this intersection. The land adjacent to the intersection is owned by the State of Hawai'i.

The intersection needs to be graded to accommodate the new intersection configuration. Drainage must be considered to accommodate increased surface runoff. Figure 9 shows the proposed road widening and curve alignment in this area. Proposed improvements to the Ma'alo Road / Driveways 1 and 2 intersection are:

- Widen roads and pave: 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Acquire additional ROW (including survey maps)
- Relocate/widen double-swing gate

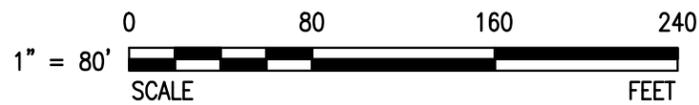
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EXIST ϕ
MAALO ROAD

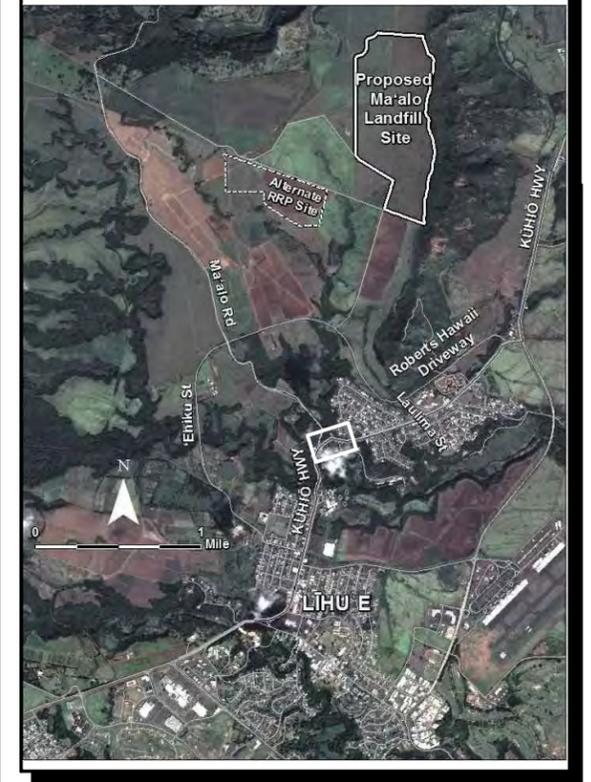


PLAN – KAPAIA BRIDGE ON KUHIO HWY

SCALE: 1" = 80'



KEY MAP



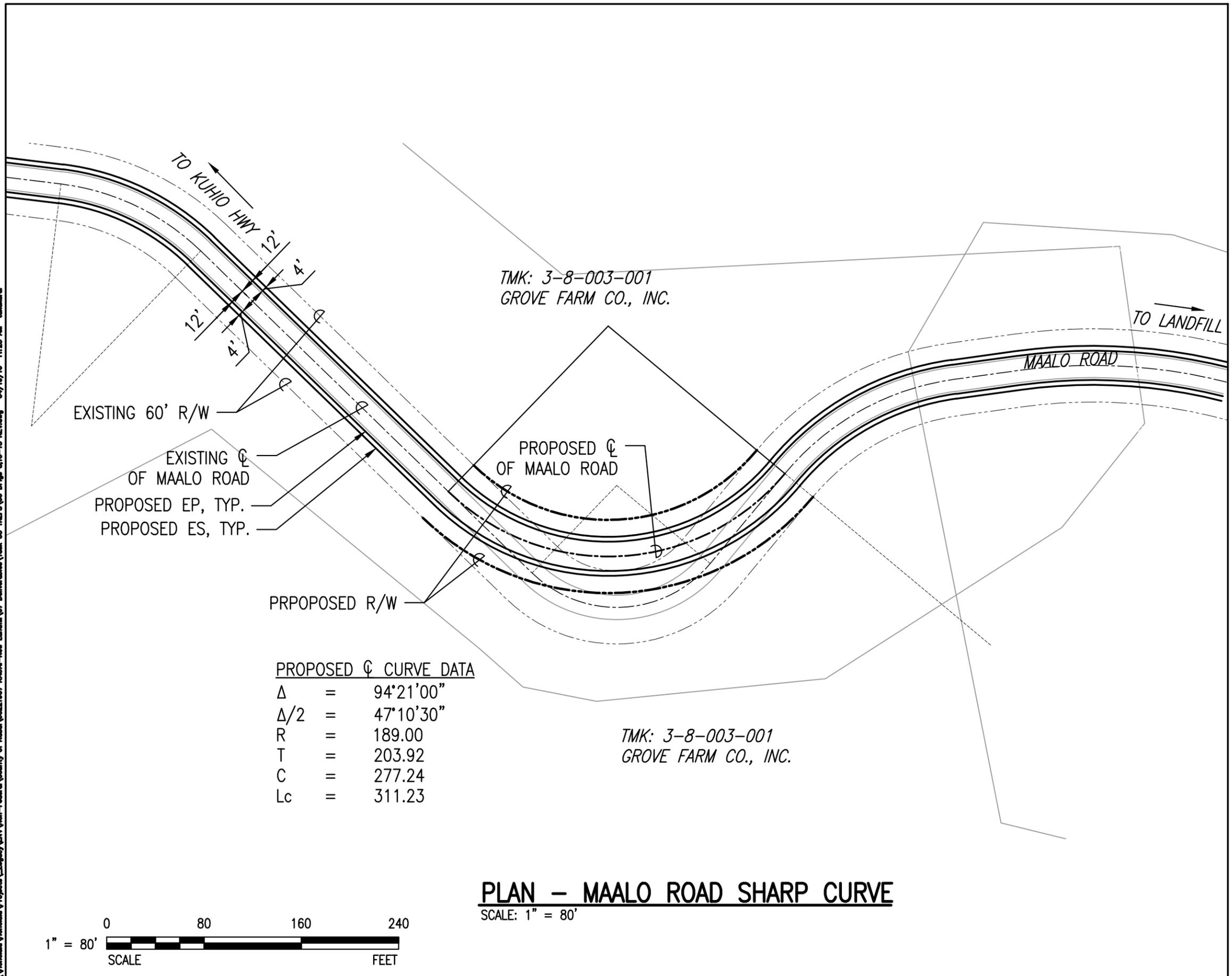
NOTES

SOURCE: HDOT PROJ. NO. ARR-0583(1) 2009
DATE: 10-10-2013



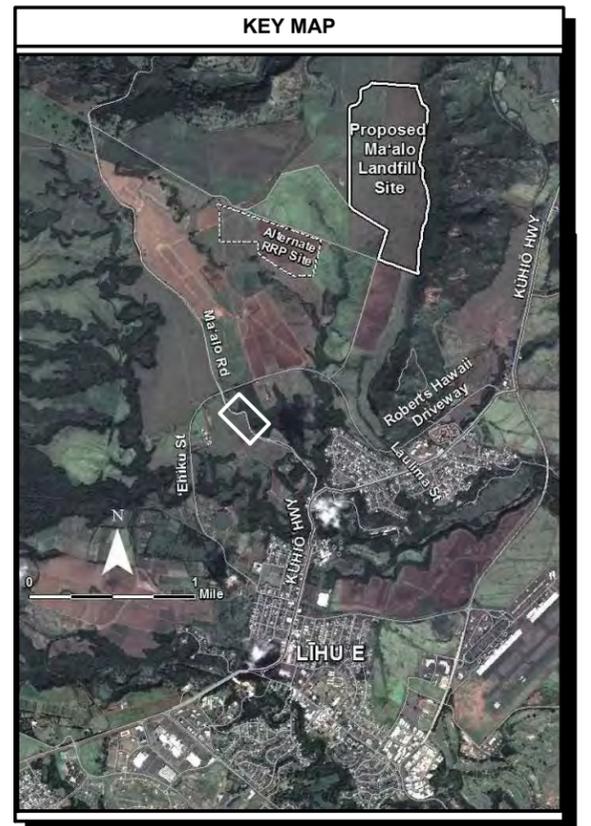
Figure 7
Plan of Kapaia Bridge on Kūhiō Highway
New Kaua'i Landfill Traffic and Roadways
Engineering Feasibility Study

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PLAN - MAALO ROAD SHARP CURVE

SCALE: 1" = 80'



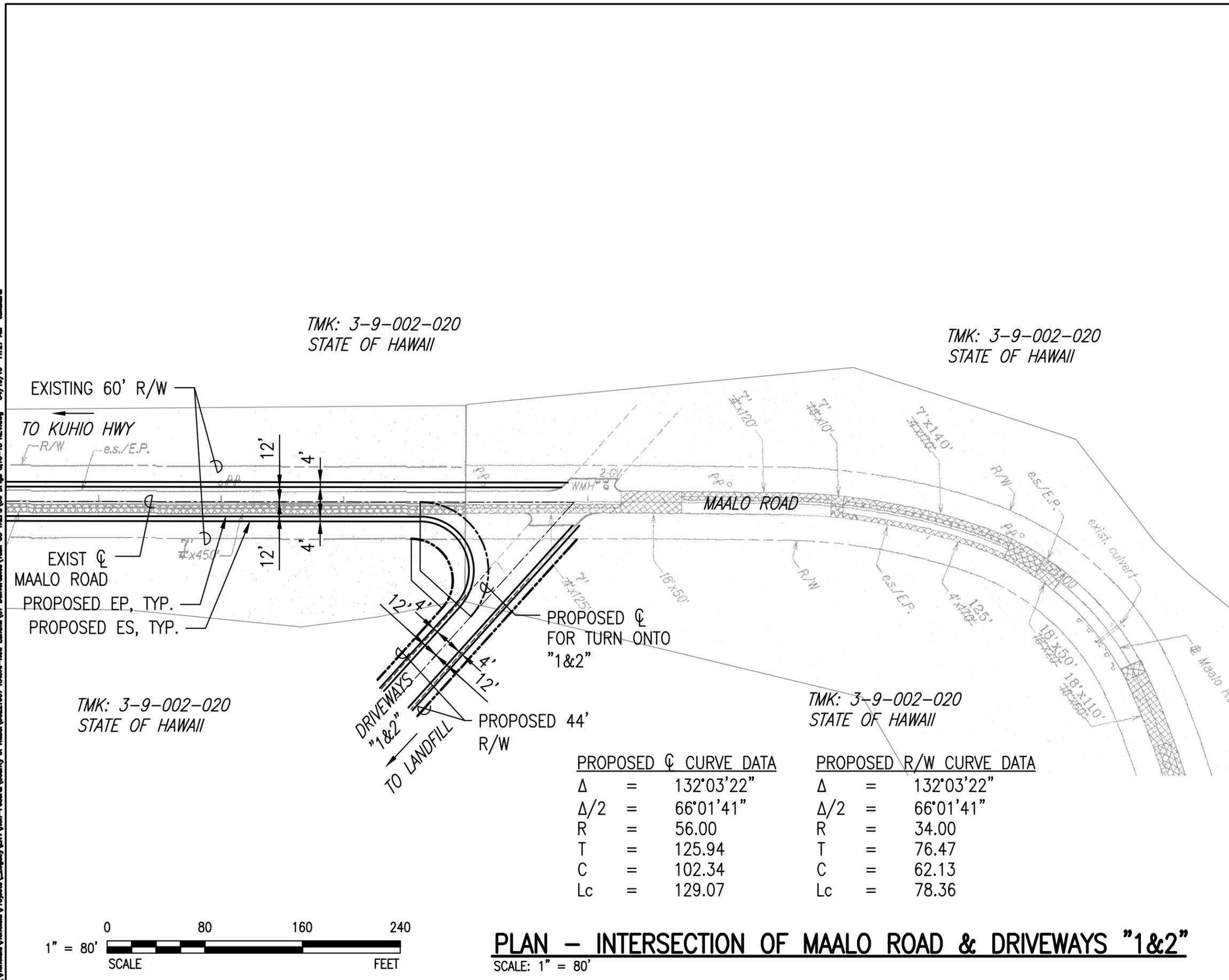
NOTES

SOURCE: HDOT PROJ. NO. ARR-0583(1) 2009
 DATE: 10-10-2013



Figure 8
 Plan of Sharp Curve on Ma'alo Road
 New Kaua'i Landfill Traffic and Roadways
 Engineering Feasibility Study

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TMK: 3-9-002-020
STATE OF HAWAII

PROPOSED ϕ CURVE DATA		PROPOSED R/W CURVE DATA	
Δ	= 132°03'22"	Δ	= 132°03'22"
$\Delta/2$	= 66°01'41"	$\Delta/2$	= 66°01'41"
R	= 56.00	R	= 34.00
T	= 125.94	T	= 76.47
C	= 102.34	C	= 62.13
Lc	= 129.07	Lc	= 78.36



PLAN – INTERSECTION OF MAALO ROAD & DRIVEWAYS "1&2"
SCALE: 1" = 80'

KEY MAP



NOTES

SOURCE: HDOT PROJ. NO. 583A-01-07M 2007
DATE: 10-10-2013



Figure 9
Plan of Ma'alo Road /
Driveways 1 and 2 Intersection
New Kaua'i Landfill Traffic and Roadways
Engineering Feasibility Study

3.3.1.7 DRIVEWAYS 1 AND 2

Driveways 1 and 2 connect Ma'alo Road to the project site. Driveway 1 is a direct route to the MSWLF that crosses two existing culverts. If selected as the proposed-project access route, this route will require widening of the roadway into the wetland and reconstruction of the culverts connecting portions of the wetland areas, which would trigger additional wetland mitigation requirements, i.e., U.S. Army Corps of Engineers (USACE) consultation and Clean Water Act Section 404 Permit. Because specific requirements would need to be discussed with USACE, exact requirements and associated costs cannot be determined at this time. Subject to USACE oversight, mitigation could conceivably consist of erecting barriers to keep cattle out of the wetlands, improving the wetland hydrology, or creating other wetland areas. Because requirements and costs are not currently determinable, a placeholder cost has been assumed. Driveway 2 is an alternate route with greater length; however, this route bypasses the culverts and wetland area.

Proposed improvements to the selected driveway are as follows:

- Provide chain-link fence on both sides of the driveway
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Widen/relocate gate
- For Driveway 1 only: Reconstruct culverts connecting portions of the offsite wetlands, widen the road into the wetlands, and provide wetland consultation, permitting, and mitigation
- Acquire additional ROW (including survey maps)

3.3.2 Permitting, Land Use, and Land Acquisitions

The ROW acquisitions described above are on properties currently zoned as Agricultural and Industrial. The owners of the ROW acquisition areas are Grove Farm Co., Inc. and the State of Hawai'i. Estimated time for rezoning and ROW acquisition is 12 months.

The proposed improvements described above will require a National Pollutant Discharge Elimination System (NPDES) Form C permit from the State of Hawai'i Department of Health (DOH). Estimated time for approval from DOH is 6 months. If Driveway 1 is selected as part of the proposed-project access route, then additional environmental requirements would be triggered, which could require 12 months or more for studies, permitting, and approval.

3.3.3 Planning-Level Cost Estimate

Table 10 and Table 11 provide the detailed cost estimates for the Ma'alo Road access routes. The planning-level cost estimates are:

- A1: \$42.8 million
- A2: \$41.4 million

Due to the wetlands, the estimate for Driveway 1 is less certain than the estimate for Driveway 2.

Table 10: Access Route A1 (Ma'alo Road, Driveway 1) Detailed Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Costs
Ma'alo Road Roadway Improvements					
	Widen roadways and repave				
	Unclassified Excavation	20,800	CY	\$120	\$2,496,000
	Asphalt Concrete Pavement (ACP)	5,900	tons	\$180	\$1,062,000
	Asphalt Concrete Base (ACB)	8,900	CY	\$360	\$3,204,000
	Aggregate Subbase	8,900	CY	\$120	\$1,068,000
	Reconstruct existing culverts	10	Ea	\$10,000	\$100,000
	Relocate guardrails	15,000	LF	\$100	\$1,500,000
				<i>Subtotal Road Improvements</i>	\$9,430,000
Ma'alo Road Utility Improvements					
	Power/Telephone Pole Relocation/Installation	50	Ea	\$5,000	\$250,000
	Construct Water Supply Line to Driveway 1				
	Unclassified Excavation	4,500	CY	\$50	\$225,000
	Backfill	4,500	CY	\$80	\$360,000
	12-inch Pipe	10,000	LF	\$150	\$1,500,000
	Booster Pump Station	1	LS	\$750,000	\$750,000
	Relocate 2-inch waterline	1,000	LF	\$100	\$100,000
				<i>Subtotal Utility Improvements</i>	\$3,185,000
Ma'alo Road / Kūhiō Highway Intersection Improvements					
	Signalization	1	LS	\$1,000,000	\$1,000,000
	Widen roadways and repave				
	Unclassified Excavation	190	CY	\$120	\$23,000
	Asphalt Concrete Pavement (ACP)	60	tons	\$180	\$11,000
	Asphalt Concrete Base (ACB)	80	CY	\$360	\$29,000
	Aggregate Subbase	80	CY	\$120	\$10,000
	Install Guard Rail	200	LF	\$100	\$20,000
	Install End Treatment	1	LS	\$50,000	\$50,000
	Fill and Grading	200	CY	\$120	\$24,000
	Construct Retaining wall	100	LF	\$750	\$75,000
	Relocate Utility Poles, Fire Hydrant, Backflow Preventer, Drair	1	LS	\$50,000	\$50,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
				<i>Subtotal Intersection Improvements</i>	\$1,322,000
Kapaia Bridge on Kuhio Highway					
	Bridge widening and repaving	1	Ea	\$5,000,000	\$5,000,000
				<i>Subtotal Kapaia Bridge Improvements</i>	\$5,000,000
Existing Bridge on Ma'alo Road					
	Bridge widening and repaving (including waterline support)	1	Ea	\$5,000,000	\$5,000,000
	2-inch Waterline	100	LF	\$100	\$10,000
	12-inch Waterline	100	LF	\$150	\$15,000
				<i>Subtotal Existing Bridge Improvements</i>	\$5,025,000
Existing Sharp Curve along Ma'alo Road					
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
	Excavation and Grading	400	CY	\$120	\$48,000
				<i>Subtotal Sharp Curve Improvements</i>	\$78,000

Item	Description	Qty	Unit	Unit Cost	Costs
Ma'alo Road / Driveway 1 Intersection Improvements					
	Widen roadways and repave				
	Unclassified Excavation	60	CY	\$120	\$8,000
	Asphalt Concrete Pavement (ACP)	20	tons	\$180	\$4,000
	Asphalt Concrete Base (ACB)	30	CY	\$360	\$11,000
	Aggregate Subbase	30	CY	\$120	\$4,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
	Relocate/widen Double-swing gate	1	EA	\$1,500	\$2,000
	<i>Subtotal Driveway Intersection Improvements</i>				\$59,000
Driveway 1					
	Chain-link fence	20,800	LF	\$50	\$1,040,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	60	Ea	\$5,000	\$300,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	4,700	CY	\$50	\$235,000
	Backfill	4,700	CY	\$80	\$376,000
	12-inch Pipe	10,400	LF	\$150	\$1,560,000
	New pavement & road widening				
	Unclassified Excavation	14,400	CY	\$120	\$1,728,000
	Asphalt Concrete Pavement (ACP)	4,100	tons	\$180	\$738,000
	Asphalt Concrete Base (ACB)	6,200	CY	\$360	\$2,232,000
	Aggregate Subbase	6,200	CY	\$120	\$744,000
	Relocate/widen Double-swing gate	3	Ea	\$1,500	\$5,000
	Reconstruct existing culverts	2	Ea	\$10,000	\$20,000
	Wetlands consultation, permitting, and mitigation	1	Ea	\$1,000,000	\$1,000,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$150,000	\$150,000
	<i>Subtotal Driveway 1 Improvements</i>				\$10,128,000
Permitting					
					\$50,000
Subtotal - Route A1					
					\$34,277,000
	Contingency (25%)				\$8,570,000
Total Cost - Access Route A1					
					\$42,847,000

Table 11: Access Route A2 (Ma'alo Road, Driveway 2) Detailed Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Costs
Ma'alo Road Roadway Improvements					
	Widen roadways and repave				
	Unclassified Excavation	20,800	CY	\$120	\$2,496,000
	Asphalt Concrete Pavement (ACP)	5,900	tons	\$180	\$1,062,000
	Asphalt Concrete Base (ACB)	8,900	CY	\$360	\$3,204,000
	Aggregate Subbase	8,900	CY	\$120	\$1,068,000
	Reconstruct existing culverts	10	Ea	\$10,000	\$100,000
	Relocate guardrails	15,000	LF	\$100	\$1,500,000
				<i>Subtotal Road Improvements</i>	\$9,430,000
Ma'alo Road Utility Improvements					
	Power/Telephone Pole Relocation/Installation	50	Ea	\$5,000	\$250,000
	Construct Water Supply Line to Driveway 2				
	Unclassified Excavation	4,500	CY	\$50	\$225,000
	Backfill	4,500	CY	\$80	\$360,000
	12-inch Pipe	10,000	LF	\$150	\$1,500,000
	Booster Pump Station	1	LS	\$750,000	\$750,000
	Relocate 2-inch waterline	1,000	LF	\$100	\$100,000
				<i>Subtotal Utility Improvements</i>	\$3,185,000
Ma'alo Road / Kūhiō Highway Intersection Improvements					
	Signalization	1	LS	\$1,000,000	\$1,000,000
	Widen roadways and repave				
	Unclassified Excavation	190	CY	\$120	\$23,000
	Asphalt Concrete Pavement (ACP)	60	tons	\$180	\$11,000
	Asphalt Concrete Base (ACB)	80	CY	\$360	\$29,000
	Aggregate Subbase	80	CY	\$120	\$10,000
	Install Guard Rail	200	LF	\$100	\$20,000
	Install End Treatment	1	LS	\$50,000	\$50,000
	Fill and Grading	200	CY	\$120	\$24,000
	Construct Retaining wall	100	LF	\$750	\$75,000
	Relocate Utility Poles, Fire Hydrant, Backflow Preventer, Drain	1	LS	\$50,000	\$50,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
				<i>Subtotal Intersection Improvements</i>	\$1,322,000
Kapaia Bridge on Kuhio Highway					
	Bridge widening and repaving	1	Ea	\$5,000,000	\$5,000,000
				<i>Subtotal Kapaia Bridge Improvements</i>	\$5,000,000
Existing Bridge on Ma'alo Road					
	Bridge widening and repaving (including waterline support)	1	Ea	\$5,000,000	\$5,000,000
	2-inch Waterline	100	LF	\$100	\$10,000
	12-inch Waterline	100	LF	\$150	\$15,000
				<i>Subtotal Existing Bridge Improvements</i>	\$5,025,000
Existing Sharp Curve along Ma'alo Road					
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
	Excavation and Grading	400	CY	\$120	\$48,000
				<i>Subtotal Sharp Curve Improvements</i>	\$78,000

Item	Description	Qty	Unit	Unit Cost	Costs
Ma'alo Road / Driveway 2 Intersection Improvements					
	Widen roadways and repave				
	Unclassified Excavation	60	CY	\$120	\$8,000
	Asphalt Concrete Pavement (ACP)	20	tons	\$180	\$4,000
	Asphalt Concrete Base (ACB)	30	CY	\$360	\$11,000
	Aggregate Subbase	30	CY	\$120	\$4,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
	Relocate/widen Double-swing gate	1	EA	\$1,500	\$2,000
	<i>Subtotal Driveway Intersection Improvements</i>				\$59,000
Driveway 2					
	Chain-link fence	20,400	LF	\$50	\$1,020,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	60	Ea	\$5,000	\$300,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	4,600	CY	\$50	\$230,000
	Backfill	4,600	CY	\$80	\$368,000
	12-inch Pipe	10,200	LF	\$150	\$1,530,000
	New pavement & road widening				
	Unclassified Excavation	14,200	CY	\$120	\$1,704,000
	Asphalt Concrete Pavement (ACP)	4,100	tons	\$180	\$738,000
	Asphalt Concrete Base (ACB)	6,100	CY	\$360	\$2,196,000
	Aggregate Subbase	6,100	CY	\$120	\$732,000
	Relocate/widen Double-swing gate	3	Ea	\$1,500	\$5,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$150,000	\$150,000
	<i>Subtotal Driveway 1 Improvements</i>				\$8,973,000
Permitting					
					\$50,000
Subtotal - Route A2					
					\$33,122,000
	Contingency (25%)				\$8,281,000
Total Cost - Access Route A2					
					\$41,403,000

3.4 'EHIKU STREET ACCESS (B1, B2)

3.4.1 Existing Conditions and Improvements

The 'Ehiku Street access is shown on Figure 4 as Routes B1 and B2. Both access routes start at the 'Ehiku Street / Kūhiō Highway intersection. 'Ehiku Street intersects with Ma'alo Road, at which point the route follows the Ma'alo Road access, including Driveways 1 and 2.

3.4.1.1 'EHIKU STREET ROADWAY IMPROVEMENTS

'Ehiku Street is under County jurisdiction from Kūhiō Highway to Kanakolu Street and is owned by Grove Farm Co., Inc. from Kanakolu Street to Ma'alo Road, with gates on each end. The existing road is paved from Kūhiō Highway to Ma'alo Road. From Kūhiō Highway to Kanakolu Street, the road has two 10-ft lanes and a 10-ft shoulder/parking area on the north side of the street. A typical section of this segment is presented in Figure 5. From Kanakolu Street to Ma'alo Road, the existing roadway is a 30-ft-wide paved road; no defined lane widths or shoulder widths are present. The ROW is 44 ft wide. The existing pavement sections could not be found from as-built records.

Proposed improvements to 'Ehiku Street, which would conform to AASHTO and Hawai'i DOT requirements, are:

- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Acquire additional ROW along private portion of 'Ehiku Street

3.4.1.2 MA'ALO ROAD ROADWAY IMPROVEMENTS

Ma'alo Road is under State jurisdiction. The typical section through this area consists of two paved 10-ft lanes and 3-ft unimproved shoulders. Existing guardrails along the access route were observed during a site visit. The existing road consists of seven existing culverts before reaching the intersection with Driveways 1 and 2. The ROW is 60 ft wide. The existing pavement section could not be found from as-built records.

Proposed improvements to Ma'alo Road, which conform to AASHTO and Hawai'i DOT requirements, are:

- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Reconstruct existing culverts
- Relocate guardrails

3.4.1.3 'EHIKU STREET / MA'ALO ROAD UTILITY IMPROVEMENTS

Along routes B1 and B2, the nearest water connection is the 16-inch main along Ma'alo Road, where electricity and telephone service are also available. Based on conceptual analysis, this 8-inch main is sufficient to handle the additional flow. If the 8-inch main cannot handle the additional flow, then an alternative is to connect to the 12-inch main at the intersection of 'Ehiku Street and Kūhiō Highway. Although wastewater connection is available at the most upstream manhole along 'Ehiku Street, it is recommended that cesspools be installed at the facility instead.

In addition to the normal utility requirements for all of the access routes, a large earthen "culvert" exists at a waterway that passes under 'Ehiku Street, south of the Ma'alo intersection. The channel bottom is approximately 50–75 ft below the road. The property owner has been monitoring the erosion of the culvert opening over the years as it approaches the road. Soft clay material was observed along the culvert walls during a site visit, and erosion is evident by the material that has fallen into the channel bottom. The structural integrity of the earthen culvert is unknown, and likely problematic. An extensive geotechnical analysis would be required. It is likely that this access route would require significant design and reconstruction of a new culvert, and possible work in a waterway, which is reflected in the cost estimate presented below.

Recommended utility improvements to 'Ehiku Street and Ma'alo Road are:

- Relocate power and telephone poles to accommodate road widening
- Connect water to Driveway 1 and 2
- Reconstruct waterway/culvert under 'Ehiku Road (Including investigation, design, permitting)

3.4.1.4 MA'ALO ROAD / 'EHIKU STREET INTERSECTION

The Ma'alo Road / 'Ehiku Street intersection is a 4-way, unsignalized intersection. The State DOT ROW is 60 ft wide. The existing intersection cannot accommodate the WB-40 truck-turning movements, thus requiring widening of the intersection. The existing pavement sections could not be found from as-built records.

The proposed intersection layout is shown on Figure 10. Proposed improvements to the 'Ehiku Street/Ma'alo Road intersection are:

- Acquire additional ROW
- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase

Costs for these improvements are captured within the estimates for Ma'alo Road and 'Ehiku Street. Upon implementation of the proposed improvements, all turning movements at the proposed intersection would accommodate the WB-40 design vehicle.

3.4.1.5 'EHIKU STREET / KŪHIŌ HIGHWAY INTERSECTION

The 'Ehiku Street / Kūhiō Highway intersection is a 4-way signalized intersection. The State DOT ROW is 60 ft wide. The existing 'Ehiku Street / Kūhiō Highway intersection has two lanes in the northbound (Kapa'a-bound) direction: a through lane and a left/through lane. No exclusive left-turn phase operates at the signal for northbound traffic turning left into 'Ehiku Street. The existing intersection cannot accommodate the WB-40 truck-turning movements. The existing pavement sections could not be found from as-built records.

The proposed intersection layout is shown on Figure 11. Proposed improvements to the 'Ehiku Street/Ma'alo Road intersection are:

- Widen roads and pave: 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
 - Right-turn from Kūhiō Highway southbound onto 'Ehiku Street:
Increase turning radius to 60 feet to accommodate the large trucks
- Construct American Disabilities Act (ADA)-accessible pedestrian ramps with signal heads on all corners of the intersection
- Relocate electrical/traffic cabinet, master arm, traffic signal and pull boxes
- Acquire additional ROW land (including survey maps)

Upon implementation of the proposed improvements, all turning movements at the proposed intersection would accommodate the WB-40 design vehicle.

3.4.1.6 MA'ALO ROAD / DRIVEWAYS 1 AND 2 INTERSECTION

A sharp right turn exists northbound on Ma'alo Road at the intersection with Driveways 1 and 2, as described above in Section 3.3.1.6.

Proposed improvements to the Ma'alo Road / Driveways 1 and 2 intersection are:

- Widen roads and pave: 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Acquire additional ROW land (including survey maps)
- Relocate/widen double-swing gate

3.4.1.7 DRIVEWAYS 1 AND 2

Driveways 1 and 2 connect Ma'alo Road to the project site. Driveway 1 is a direct route to the MSWLF that crosses two existing culverts in the vicinity of offsite wetlands. If selected as the proposed-project access route, this route will require wetland mitigation measures, as described

above in Section 3.3.1.7. Driveway 2 is an alternate route with greater length; however, this route bypasses the culverts and wetland area.

Proposed improvements to the selected driveway are:

- Provide chain-link fence on both sides of the driveway
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Widen and relocate gate
- For Driveway 1 only: Reconstruct culverts connecting portions of the offsite wetlands, widen the road into the wetlands, and provide wetland consultation, permitting, and mitigation
- Acquire additional ROW land (including survey maps)

3.4.2 Permitting, Land Use, and Land Acquisitions

'Ehiku Street is zoned Agricultural. The ROW acquisitions described above are on properties currently zoned as Agricultural. The property owner of the ROW acquisition area is Grove Farm Co., Inc. Estimated time for rezoning and ROW acquisition is 12 months.

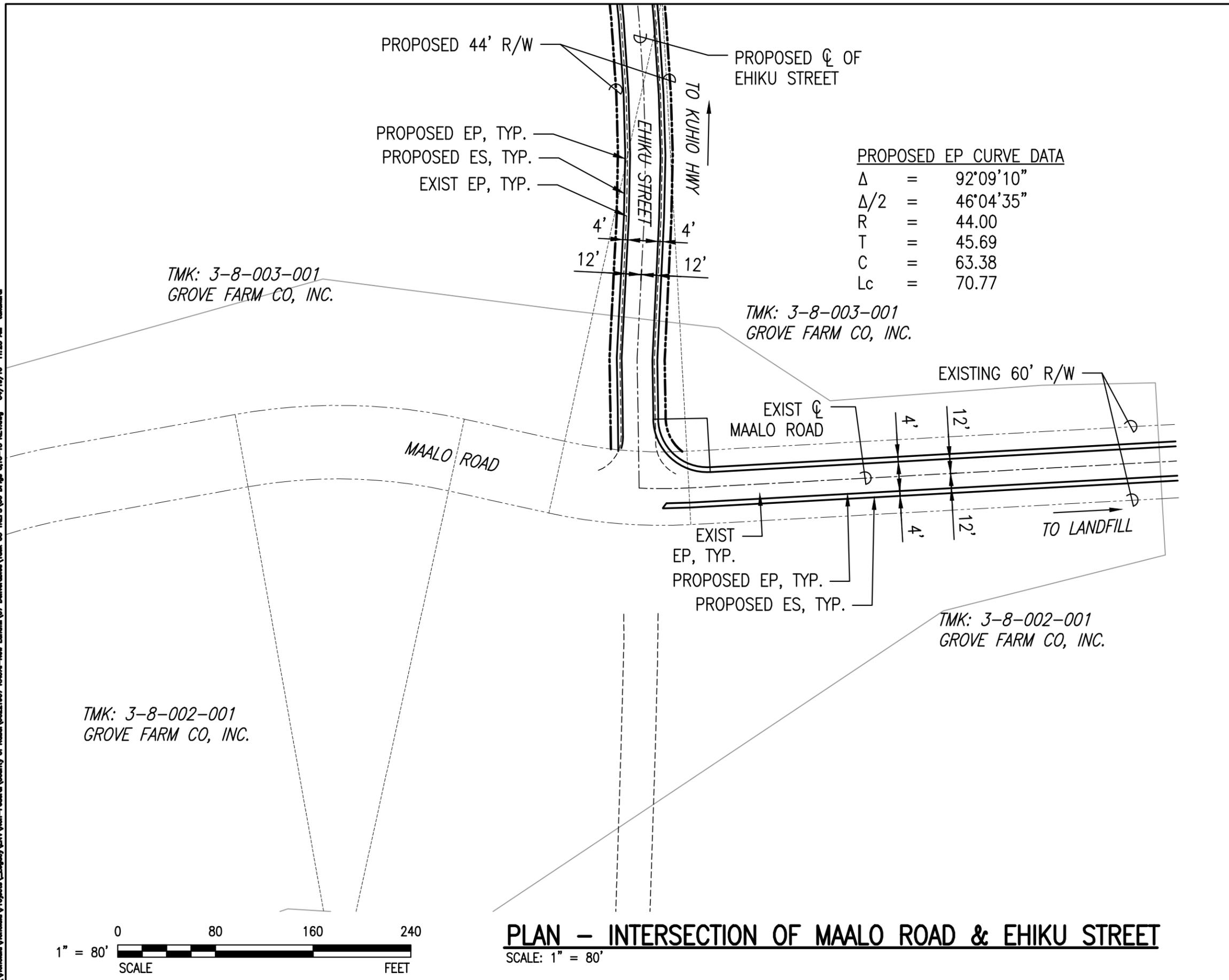
The proposed improvements described above would require an NPDES Form C permit from DOH. Estimated time for approval from DOH is 6 months. If Driveway 1 is selected as the proposed-project access route, then additional environmental requirements may be triggered, which could result in 12 months or more required for studies, permitting, and approval.

3.4.3 Planning-Level Cost Estimate

Table 12 and Table 13 provide detailed cost estimates for the 'Ehiku Street access routes. The planning-level cost estimates are:

- B1: \$43.3 million
- B2: \$41.8 million

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PROPOSED EP CURVE DATA

Δ	=	92°09'10"
$\Delta/2$	=	46°04'35"
R	=	44.00
T	=	45.69
C	=	63.38
Lc	=	70.77



NOTES

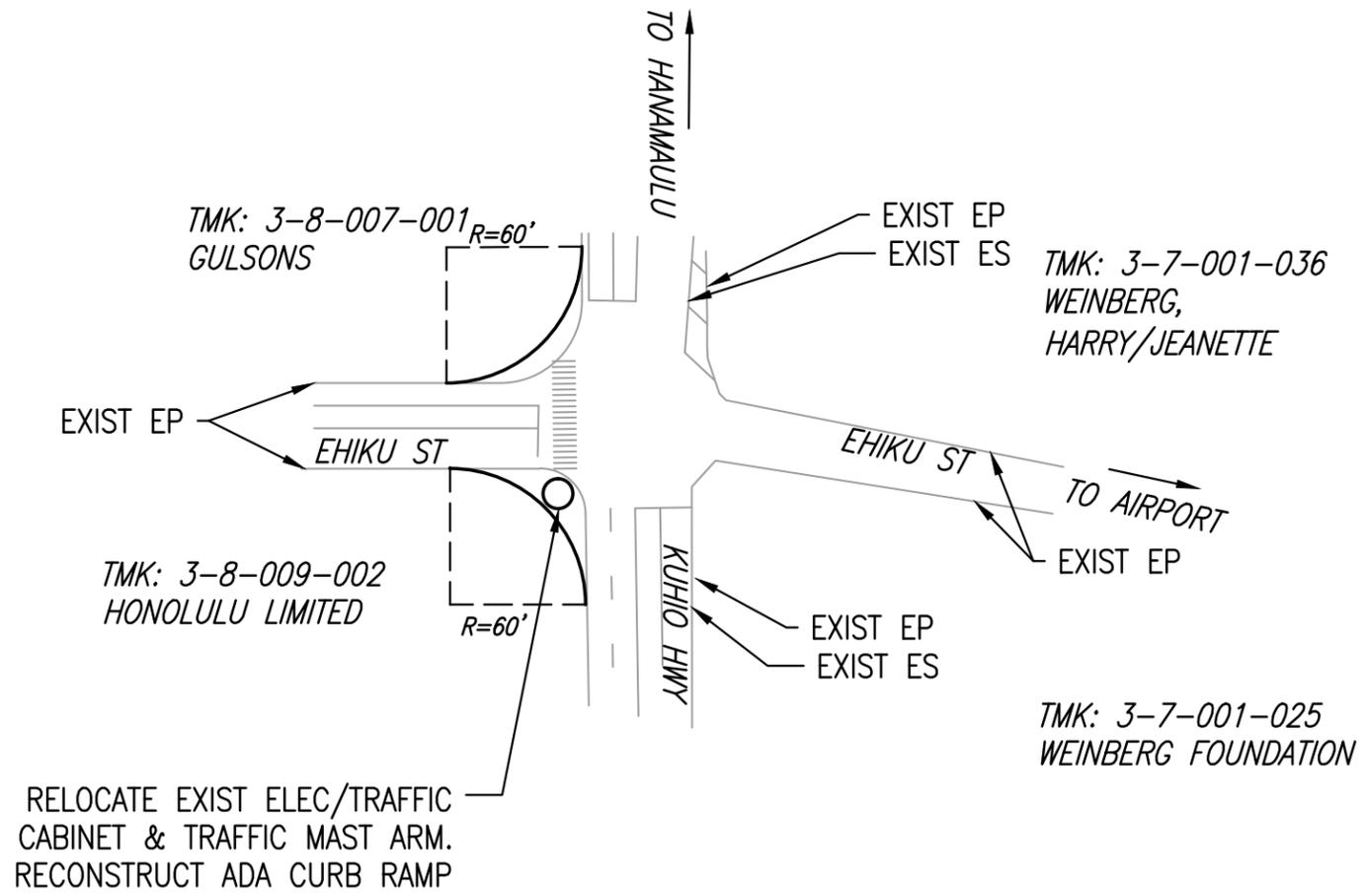
SOURCE: HDOT PROJ. NO. ARR-0583(1) 2009
 DATE: 10-10-2013



PLAN - INTERSECTION OF MAALO ROAD & EHIKU STREET
 SCALE: 1" = 80'

Figure 10
 Plan of Ma'alo Road /
 'Ehiku Street Intersection
 New Kaua'i Landfill Traffic and Roadways
 Engineering Feasibility Study

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PLAN – INTERSECTION OF KUHIO HWY & EHIKU STREET
SCALE: 1" = 80'

KEY MAP



NOTES

SOURCE: GOOGLE EARTH
DATE: 12-17-2013



Figure 11
Plan of EHIKU Street /
Kūhiō Highway Intersection
New Kaua'i Landfill Traffic and Roadways
Engineering Feasibility Study

Table 12: Access Route B1 ('Ehiku Street, Driveway 1) Detailed Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Costs
'Ehiku Street Roadway Improvements					
	ROW Land Acquisition (Private portion of 'Ehiku Street, including Survey Maps)	1	LS	\$150,000	\$150,000
	Widen roadways and repave				
	Unclassified Excavation	12,500	CY	\$120	\$1,500,000
	Asphalt Concrete Pavement (ACP)	3,600	tons	\$180	\$648,000
	Asphalt Concrete Base (ACB)	5,400	CY	\$360	\$1,944,000
	Aggregate Subbase	5,400	CY	\$120	\$648,000
		<i>Subtotal Road Improvements</i>			\$4,890,000
Ma'alo Road Roadway Improvements					
	Widen roadways and repave				
	Unclassified Excavation	13,700	CY	\$120	\$1,644,000
	Asphalt Concrete Pavement (ACP)	3,900	tons	\$180	\$702,000
	Asphalt Concrete Base (ACB)	5,900	CY	\$360	\$2,124,000
	Aggregate Subbase	5,900	CY	\$120	\$708,000
	Reconstruct existing culverts	7	EA	\$10,000	\$70,000
	Relocate guardrails	9,900	LF	\$100	\$990,000
		<i>Subtotal Road Improvements</i>			\$6,238,000
Utility Improvements					
	Power/Telephone Pole Relocation/Installation	40	Ea	\$5,000	\$200,000
	Construct Water Supply Line to Driveway 1				
	Unclassified Excavation	4,400	CY	\$50	\$220,000
	Backfill	4,400	CY	\$80	\$352,000
	12-inch Pipe	9,740	LF	\$150	\$1,461,000
	Booster Pump Station	1	LS	\$750,000	\$750,000
		<i>Subtotal Utility Improvements</i>			\$2,983,000
Reconstruct Waterway/Culvert Under 'Ehiku Road					
	Investigate, Design, Permit, and Repair Waterway/"Culvert"	1	EA	\$10,000,000	\$10,000,000
		<i>Subtotal Waterway/Culvert Repair</i>			\$10,000,000
'Ehiku Street / Kūhiō Highway Intersection Improvements					
	Widen roadways and repave				
	Unclassified Excavation	200	CY	\$120	\$24,000
	Asphalt Concrete Pavement (ACP)	100	tons	\$180	\$18,000
	Asphalt Concrete Base (ACB)	100	CY	\$360	\$36,000
	Aggregate Subbase	100	CY	\$120	\$12,000
	Construct ADA-accessible pedestrian ramps with signal	4	EA	\$10,000	\$40,000
	Relocate Cabinet, Mast Arm, Traffic Signal & Pull Boxes	1	LS	\$120,000	\$120,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
		<i>Subtotal Intersection Improvements</i>			\$280,000

Item	Description	Qty	Unit	Unit Cost	Costs
Ma'alo Road / Driveway 1 Intersection Improvements					
	Widen roadways and repave				
	Unclassified Excavation	60	CY	\$120	\$8,000
	Asphalt Concrete Pavement (ACP)	20	tons	\$180	\$4,000
	Asphalt Concrete Base (ACB)	30	CY	\$360	\$11,000
	Aggregate Subbase	30	CY	\$120	\$4,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
	Relocate/widen Double-swing gate	1	EA	\$1,500	\$2,000
	<i>Subtotal Driveway Intersection Improvements</i>				\$59,000
Driveway 1					
	Chain-link fence	20,800	LF	\$50	\$1,040,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	60	Ea	\$5,000	\$300,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	4,700	CY	\$50	\$235,000
	Backfill	4,700	CY	\$80	\$376,000
	12-inch Pipe	10,400	LF	\$150	\$1,560,000
	New pavement & road widening				
	Unclassified Excavation	14,400	CY	\$120	\$1,728,000
	Asphalt Concrete Pavement (ACP)	4,100	tons	\$180	\$738,000
	Asphalt Concrete Base (ACB)	6,200	CY	\$360	\$2,232,000
	Aggregate Subbase	6,200	CY	\$120	\$744,000
	Relocate/widen Double-swing gate	3	Ea	\$1,500	\$5,000
	Reconstruct existing culverts	2	Ea	\$10,000	\$20,000
	Wetlands consultation, permitting, and mitigation	1	Ea	\$1,000,000	\$1,000,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$150,000	\$150,000
	<i>Subtotal Driveway 1 Improvements</i>				\$10,128,000
	Permitting				\$50,000
	Subtotal - Route B1				\$34,628,000
	Contingency (25%)				\$8,657,000
	Total Cost - Access Route B1				\$43,285,000

Table 13: Access Route B2 ('Ehiku Street, Driveway 2) Detailed Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Costs
'Ehiku Street Roadway Improvements					
	ROW Land Acquisition (Private portion of 'Ehiku Street, including Survey Maps)	1	LS	\$150,000	\$150,000
	Widen roadways and repave				
	Unclassified Excavation	12,500	CY	\$120	\$1,500,000
	Asphalt Concrete Pavement (ACP)	3,600	tons	\$180	\$648,000
	Asphalt Concrete Base (ACB)	5,400	CY	\$360	\$1,944,000
	Aggregate Subbase	5,400	CY	\$120	\$648,000
		<i>Subtotal Road Improvements</i>			\$4,890,000
Ma'alo Road Roadway Improvements					
	Widen roadways and repave				
	Unclassified Excavation	13,700	CY	\$120	\$1,644,000
	Asphalt Concrete Pavement (ACP)	3,900	tons	\$180	\$702,000
	Asphalt Concrete Base (ACB)	5,900	CY	\$360	\$2,124,000
	Aggregate Subbase	5,900	CY	\$120	\$708,000
	Reconstruct existing culverts	7	EA	\$10,000	\$70,000
	Relocate guardrails	9,900	LF	\$100	\$990,000
		<i>Subtotal Road Improvements</i>			\$6,238,000
Utility Improvements					
	Power/Telephone Pole Relocation/Installation	40	Ea	\$5,000	\$200,000
	Construct Water Supply Line to Driveway 1				
	Unclassified Excavation	4,400	CY	\$50	\$220,000
	Backfill	4,400	CY	\$80	\$352,000
	12-inch Pipe	9,740	LF	\$150	\$1,461,000
	Booster Pump Station	1	LS	\$750,000	\$750,000
		<i>Subtotal Utility Improvements</i>			\$2,983,000
Repair Waterway/Culvert Under 'Ehiku Road					
	Investigate, Design, Permit, and Repair Waterway/"Culvert"	1	EA	\$10,000,000	\$10,000,000
		<i>Subtotal Waterway/Culvert Repair</i>			\$10,000,000
'Ehiku Street / Kūhiō Highway Intersection Improvements					
	Widen roadways and repave				
	Unclassified Excavation	200	CY	\$120	\$24,000
	Asphalt Concrete Pavement (ACP)	100	tons	\$180	\$18,000
	Asphalt Concrete Base (ACB)	100	CY	\$360	\$36,000
	Aggregate Subbase	100	CY	\$120	\$12,000
	Construct ADA-accessible pedestrian ramps with signal	4	EA	\$10,000	\$40,000
	Relocate Cabinet, Mast Arm, Traffic Signal & Pull Boxes	1	LS	\$120,000	\$120,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
		<i>Subtotal Intersection Improvements</i>			\$280,000

Item	Description	Qty	Unit	Unit Cost	Costs
Ma'alo Road / Driveway 2 Intersection Improvements					
	Widen roadways and repave				
	Unclassified Excavation	60	CY	\$120	\$8,000
	Asphalt Concrete Pavement (ACP)	20	tons	\$180	\$4,000
	Asphalt Concrete Base (ACB)	30	CY	\$360	\$11,000
	Aggregate Subbase	30	CY	\$120	\$4,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
	Relocate/widen Double-swing gate	1	EA	\$1,500	\$2,000
	<i>Subtotal Driveway Intersection Improvements</i>				\$59,000
Driveway 2					
	Chain-link fence	20,400	LF	\$50	\$1,020,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	60	Ea	\$5,000	\$300,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	4,600	CY	\$50	\$230,000
	Backfill	4,600	CY	\$80	\$368,000
	12-inch Pipe	10,200	LF	\$150	\$1,530,000
	New pavement & road widening				
	Unclassified Excavation	14,200	CY	\$120	\$1,704,000
	Asphalt Concrete Pavement (ACP)	4,100	tons	\$180	\$738,000
	Asphalt Concrete Base (ACB)	6,100	CY	\$360	\$2,196,000
	Aggregate Subbase	6,100	CY	\$120	\$732,000
	Relocate/widen Double-swing gate	3	Ea	\$1,500	\$5,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$150,000	\$150,000
	<i>Subtotal Driveway 1 Improvements</i>				\$8,973,000
Permitting					\$50,000
Subtotal - Route B2					\$33,473,000
	Contingency (25%)				\$8,368,250
Total Cost - Access Route B2					\$41,841,250

3.5 LAULIMA STREET ACCESS (C3)

3.5.1 Existing Conditions and Improvements

The Laulima Street access is shown on Figure 1 as Route C3. The access route starts at the Laulima Street / Kūhiō Highway intersection and ends at the project site. If the alternate RRP site is implemented, then a portion of either Driveway 1 (approximately 1,913 linear feet) or Driveway 2 (approximately 4,865 linear feet) will be used to connect the Landfill site to the RRP site.

3.5.1.1 LAULIMA STREET ROADWAY IMPROVEMENTS

Laulima Street makai of Kūhiō Highway is under County jurisdiction. Laulima Street mauka of Kūhiō Highway is owned by Grove Farm Co, Inc. Laulima Street mauka of Kūhiō Highway extends a short distance past the commercial buildings near the highway to the existing gate, beyond which is a gravel road, designated as Driveway 3 (Figure 4). Laulima Street is a 30-ft-wide paved road, and no defined lane widths or shoulder widths are present. The existing pavement section could not be found from as-built records. A typical section is presented on Figure 5.

Proposed improvements to Laulima Street, which must conform to County of Kaua'i requirements, are:

- Acquire additional ROW

- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase

3.5.1.2 UTILITY IMPROVEMENTS

The nearest water connection is the 12-inch main along Kūhiō Highway at the intersection of Laulima Street. Although an existing 8-inch sewer main runs west along Kūhiō Highway, it is recommended that cesspools be installed at the facility instead. Electricity and telephone service is also available at the intersection of Laulima Street and Kūhiō Highway. Additionally, a 12-inch waterline may require relocating to satisfy the minimum cover requirements. Recommended utility improvements to the Laulima Street access route are:

- Construct power and telephone poles along the access route
- Connect water to Driveway 3

3.5.1.3 LAULIMA STREET / KŪHIŌ HIGHWAY INTERSECTION

The existing Laulima Street / Kūhiō Highway intersection is a 3-way, unsignalized intersection (Laulima Street mauka of Kūhiō Highway is not currently a public roadway). Laulima Street mauka of Kūhiō Highway is currently a private driveway that provides access to businesses. The Kūhiō Highway State DOT ROW is 60 ft wide. The existing intersection cannot accommodate the WB-40 truck-turning movements. The existing pavement sections could not be found from as-built records.

Based on discussions with the State DOT regarding this access route to the project site, coordination may be required with the future Līhu'e bypass project. The State DOT suggests including a left-turn lane in the northbound direction on Kūhiō Highway.

The proposed intersection layout is shown on Figure 12. Access to businesses will be maintained. Proposed improvements to the Laulima Street / Kūhiō Highway intersection are:

- Signalize the intersection
- Widen roads and pave: 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
 - Left-turn lane in both directions on Kūhiō Highway: 11-ft lane, 100-ft storage length, 100-ft taper length
 - 4-way intersection: Reconfigure median islands
- Excavation and Grading along Laulima Street sloped shoulder
- Construct retaining wall (approximately 8 ft tall) along Laulima Street due to slope excavation
- Construct ADA-accessible pedestrian ramps on all corners of the intersection
- Relocate utility poles, culvert
- Acquire additional ROW land (including survey maps)

Upon implementation of the proposed improvements, all turning movements at the proposed intersection would accommodate the WB-40 design vehicle.

3.5.1.4 DRIVEWAY 3

Driveway 3 connects Laulima Street to the proposed project site.

Proposed improvements to the driveway are:

- Provide chain-link fence on both sides of the driveway

- Provide noise barrier on side fronting residential housing
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Acquire additional ROW land (including survey maps)

3.5.1.5 DRIVEWAY 1 OR 2

If the alternate RRP site is implemented, then one of the following two alternatives will be used to connect the Landfill site to the RRP site:

- Approximately 1,913 linear feet of Driveway 1
- Approximately 4,965 linear feet of Driveway 2

Driveway 1 is a direct route to the RRP site that crosses two existing culverts in the vicinity of offsite wetlands. If selected as the proposed-project access route, this route will require wetland mitigation measures, as described above in Section 3.3.1.7. Driveway 2 is an alternate, longer route that bypasses the culverts and wetland area, but may have more impact on use of the parcel.

Proposed improvements to the selected driveway are:

- Provide chain-link fence on both sides of the driveway
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Widen and relocate gate
- For Driveway 1 only: Reconstruct culverts connecting portions of the offsite wetlands, widen the road into the wetlands, and provide wetlands consultation, permitting, and mitigation.
- Acquire additional ROW land (including survey maps)

3.5.2 Permitting, Land Use, and Land Acquisitions

Laulima Street mauka of the highway is zoned as Mixed Agricultural/Industrial. The ROW acquisitions described above are on properties currently zoned as Mixed Agricultural/Industrial. The property owners of the ROW acquisition areas are Grove Farm Co., Inc. and the State of Hawai'i. Estimated time for rezoning and ROW acquisition is 12 months.

The proposed improvements described above will require an NPDES Form C permit from DOH. Estimated time for approval from DOH is 6 months.

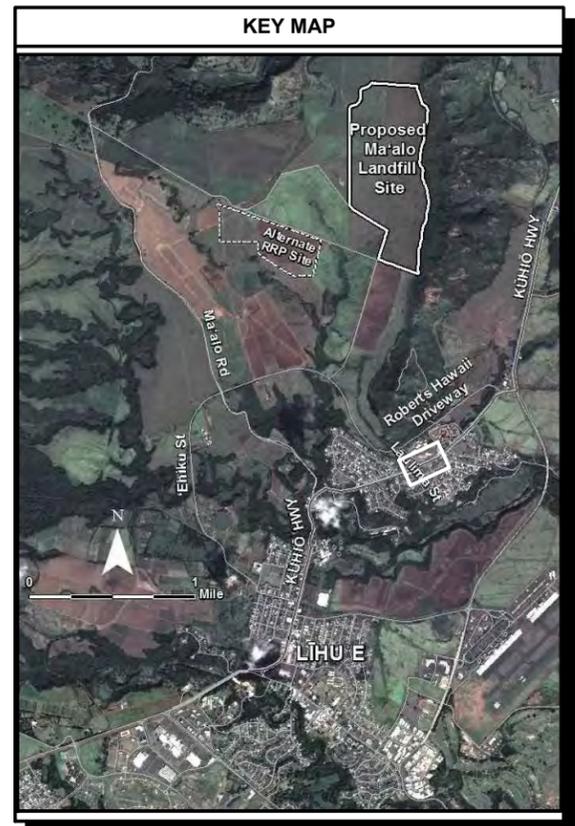
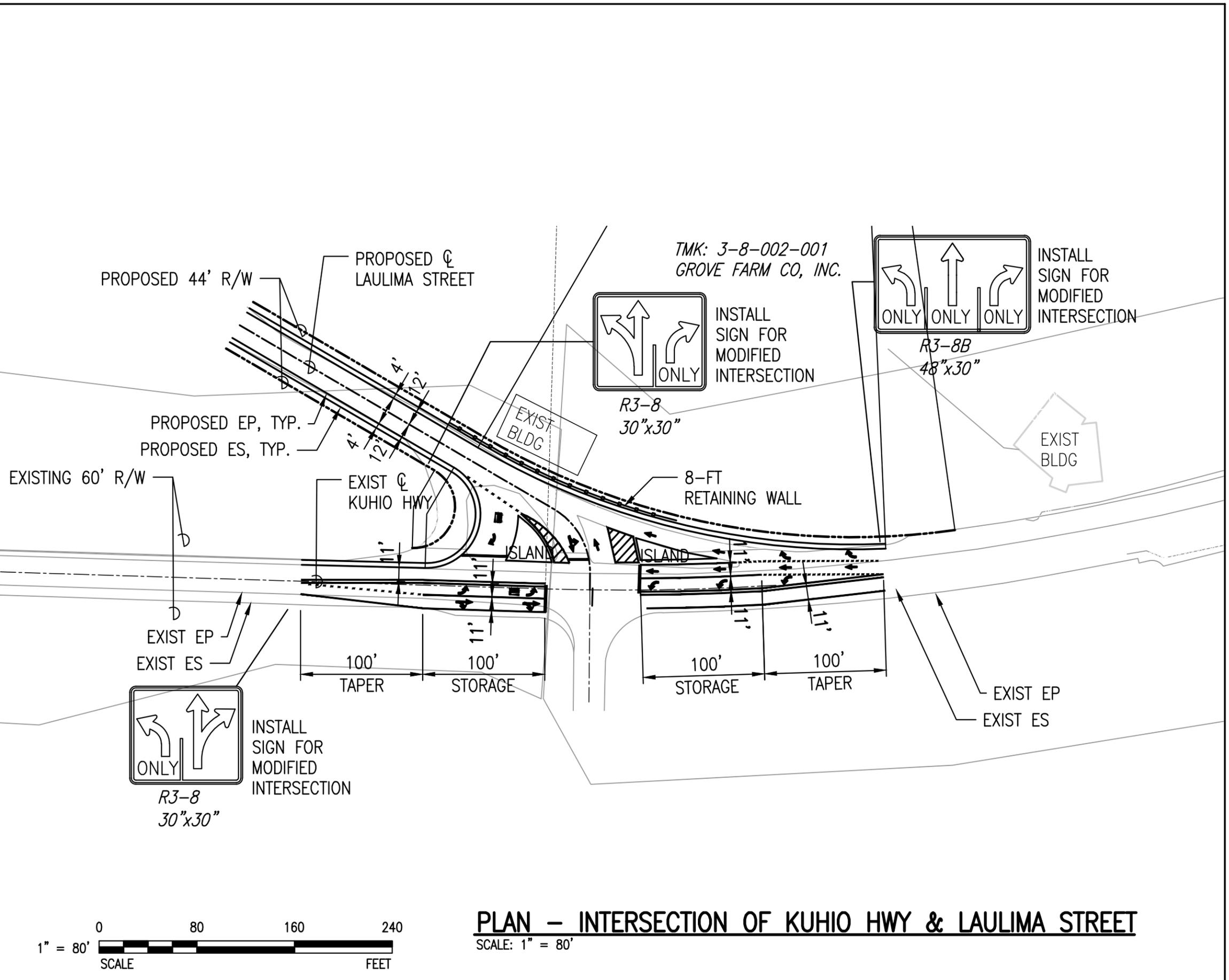
3.5.3 Planning-Level Cost Estimate

Table 14 provides detailed cost estimates for the Laulima Street access route. The planning-level cost estimate is:

- C3: \$12.7 million

Additional costs may be incurred if the Alternate RRP site is chosen (see Section 3.8).

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NOTES

SOURCE: HDOT PROJ. NO. 56A-01-04M 2005
 DATE: 10-10-2013



PLAN – INTERSECTION OF KUHIO HWY & LAULIMA STREET
 SCALE: 1" = 80'

Figure 12
 Plan of Laulima Street /
 Kūhiō Highway Intersection
 New Kauaʻi Landfill Traffic and Roadways
 Engineering Feasibility Study

Table 14: Access Route C3 (Laulima Street) Cost Estimate Breakdown

Item	Description	Qty	Unit	Unit Cost	Costs
Laulima Street Roadway Improvements					
	ROW acquisition	1	LS	\$50,000	\$50,000
	Widen roadways and repave				
	Unclassified Excavation	1,800	CY	\$120	\$216,000
	Asphalt Concrete Pavement (ACP)	600	tons	\$180	\$108,000
	Asphalt Concrete Base (ACB)	800	CY	\$360	\$288,000
	Aggregate Subbase	800	CY	\$120	\$96,000
		<i>Subtotal Road Improvements</i>			\$758,000
Utility Improvements					
	Power/Telephone Pole Relocation/Installation	12	Ea	\$5,000	\$60,000
	Construct Water Supply Line to Driveway 3				
	Unclassified Excavation	600	CY	\$50	\$30,000
	Backfill	600	CY	\$80	\$48,000
	12-inch Pipe	1,261	LF	\$150	\$190,000
	Booster Pump Station	1	LS	\$750,000	\$750,000
		<i>Subtotal Utility Improvements</i>			\$1,078,000
Laulima Street / Kūhiō Highway Intersection Improvements					
	Signalization	1	LS	\$1,000,000	\$1,000,000
	Widen roadways and repave				
	Unclassified Excavation	900	CY	\$120	\$108,000
	Asphalt Concrete Pavement (ACP)	300	tons	\$180	\$54,000
	Asphalt Concrete Base (ACB)	400	CY	\$360	\$144,000
	Aggregate Subbase	400	CY	\$120	\$48,000
	Construct Retaining wall	200	LF	\$750	\$150,000
	Construct ADA-accessible pedestrian ramps	4	EA	\$10,000	\$40,000
	Relocate Utility Poles, Culvert	1	LS	\$50,000	\$50,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
		<i>Subtotal Intersection Improvements</i>			\$1,624,000
Driveway 3					
	Chain-link fence	15,000	LF	\$50	\$750,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	40	Ea	\$5,000	\$200,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	3,400	CY	\$50	\$170,000
	Backfill	3,400	CY	\$80	\$272,000
	12-inch Pipe	7,500	LF	\$150	\$1,125,000
	New pavement & road widening				
	Unclassified Excavation	10,400	CY	\$120	\$1,248,000
	Asphalt Concrete Pavement (ACP)	3,000	tons	\$180	\$540,000
	Asphalt Concrete Base (ACB)	4,500	CY	\$360	\$1,620,000
	Aggregate Subbase	4,500	CY	\$120	\$540,000
	Noise Barrier	1,500	LF	\$50	\$75,000
	Gate Relocation	3	EA	\$1,500	\$5,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$125,000	\$125,000
		<i>Subtotal Driveway 1 Improvements</i>			\$6,670,000
Permitting					\$50,000
Subtotal - Route C3					\$10,180,000
Contingency (25%)					\$2,545,000
Total Cost - Access Route C3					\$12,725,000

This cost estimate includes the cost to signalize the Lualima Street / Kūhiō Highway intersection. Signalization of this intersection is recommended for this alternative when warranted. Signalization would also be desirable regardless of which access route is selected, but may not be warranted for the other routes.

3.6 ROBERTS HAWAII DRIVEWAY ACCESS (D3)

3.6.1 Existing Conditions and Improvements

The Roberts Hawaii Driveway access is shown on Figure 4 as Route D3. The access route starts at the Roberts Hawaii Driveway intersection with Kūhiō Highway and intersects with Lualima Street, at which point the route follows the Lualima Street access to the landfill. If the alternate RRP site is implemented, then a portion of either Driveway 1 (approximately 1,913 linear feet) or Driveway 2 (approximately 4,865 linear feet) will be used to connect the Landfill site to the RRP site.

The Roberts Hawaii Driveway access is owned by Visionary LLC and Grove Farm Co., Inc. The existing driveway is an 18-ft wide paved road; there are no defined lane widths or shoulder widths. The existing pavement section could not be found from as-built records.

The proposed improvements to the Roberts Hawaii Driveway access, which must conform to County of Kaua'i requirements, are:

- Acquire additional ROW
- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Provide noise barrier on side fronting residential housing
- Stabilize shoulders and provide erosion control
- Provide drainage improvements (shoulder swales, culverts, drainage outfalls)

3.6.1.1 UTILITY IMPROVEMENTS

The nearest water connection is the 12-inch main along Kūhiō Highway at the intersection of Lualima Street. Although an existing 8-inch sewer main runs west along Kūhiō Highway, it is recommended that cesspools be installed at the facility instead. Electricity and telephone service is also available at the intersection of Lualima Street and Kūhiō Highway. Additionally, a 12-inch waterline may require relocating to satisfy the minimum cover requirements. Recommended utility improvements to the Roberts Hawaii Driveway access route are as follows:

- Construct power and telephone poles along Lualima Street to Driveway 3
- Connect water along Lualima Street to Driveway 3

3.6.1.2 ROBERTS HAWAII DRIVEWAY / KŪHIŌ HIGHWAY INTERSECTION

The Roberts Hawaii Driveway / Kūhiō Highway intersection is a 3-way, unsignalized intersection. The State DOT ROW is 60 ft wide. The existing intersection can accommodate WB-40 truck-turning movements. The existing pavement sections could not be found from as-built records.

Based on discussions with DOT regarding this access route to the landfill, coordination is required with the Līhu'e bypass project. A left-turn lane in the northbound direction on Kūhiō Highway is required.

The proposed intersection layout is shown on Figure 13. Access to Roberts Hawaii will be maintained. Proposed improvements to the Roberts Hawaii Driveway / Kūhiō Highway intersection are:

- Signalize the intersection
- Widen roads and pave: 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
 - Left-turn lane in northbound direction on Kūhiō Highway:
11-ft lane, 200-ft storage length, 100-ft taper length
 - Right-turn lane in southbound direction on Kūhiō Highway:
11-ft lane, 200-ft storage length, 100-ft taper length
- Construct ADA-accessible pedestrian ramps on two corners of the intersection
- Acquire additional ROW land (including survey maps)

Upon implementation of the proposed improvements, all turning movements at the proposed intersection would accommodate the WB-40 design vehicle.

3.6.1.3 DRIVEWAY 3

Driveway 3 connects Laulima Street to the proposed project site.

Proposed improvements to the driveway are:

- Stabilize shoulders and provide erosion control
- Provide chain-link fence on both sides of the driveway
- Provide noise barrier on side fronting residential housing
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Acquire additional ROW land (including survey maps)

3.6.1.4 DRIVEWAY 1 OR 2

If the alternate RRP site is implemented, then one of the following two alternatives will be used to connect the Landfill site to the RRP site:

- Approximately 1,913 linear feet of Driveway 1
- Approximately 4,965 linear feet of Driveway 2

Driveway 1 is a direct route to the RRP site that crosses two existing culverts in the vicinity of offsite wetlands. If selected as the proposed-project access route, this route will require wetland mitigation measures, as described above in Section 3.3.1.7. Driveway 2 is an alternate, longer route that bypasses the culverts and wetland area, but may have more impact on use of the parcel.

Proposed improvements to the selected driveway are:

- Provide chain-link fence on both sides of the driveway
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase

- Widen and relocate gate
- For Driveway 1 only: Reconstruct culverts connecting portions of the offsite wetlands, widen the road into the wetlands, and provide wetlands consultation, permitting, and mitigation
- Acquire additional ROW land (including survey maps)

3.6.2 Permitting, Land Use, and Land Acquisitions

The Roberts Hawaii Driveway access is zoned as Residential and Industrial. The ROW acquisitions described above are on properties currently zoned as Residential and Industrial. The property owners of the ROW acquisition areas are Visionary LLC and Grove Farm Co., Inc. Estimated time for rezoning and ROW acquisition is 12 months.

The proposed improvements described above will require an NPDES Form C permit from the State DOH. Estimated time for approval from DOH is 6 months.

3.6.3 Planning-Level Cost Estimate

Table 15 provides detailed cost estimates for the Roberts Hawaii Driveway access route. The planning-level cost estimate is:

- D3: \$14.6 million

Additional costs may be incurred if the Alternate RRP site is chosen (see Section 3.8).

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TMK: 3-8-002-003
VISIONARY LLC

R3-7
30"x30"



INSTALL SIGN FOR MODIFIED INTERSECTION

PROPOSED 44' R/W
PROPOSED EP, TYP.
PROPOSED ES, TYP.

TMK: 3-8-002-003
VISIONARY LLC
(ROBERT'S HAWAII)

PROPOSED ϕ ROBERT'S HAWAII DRIVEWAY ACCESS

200' STORAGE
100' TAPER

EXIST ES
EXIST EP

EXIST EP
EXIST ES
EXISTING 60' R/W

200' STORAGE

100' TAPER

KUHIO HWY

TO KAPULE HWY

TO LIHUE

PLAN - INTERSECTION OF KUHIO HWY & ROBERT'S HAWAII DRIVEWAY ACCESS

SCALE: 1" = 80'



KEY MAP



NOTES

SOURCE: GOOGLE EARTH
DATE: 10-10-2013



Figure 13
Plan of Roberts Hawaii Driveway /
Kūhiō Highway Intersection
New Kaua'i Landfill Traffic and Roadways
Engineering Feasibility Study

Table 15: Access Route D3 (Roberts Hawaii Driveway) Detailed Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Costs
Roberts Hawaii Driveway Roadway Improvements					
	ROW acquisition	1	LS	\$100,000	\$100,000
	Widen roadways and repave				
	Unclassified Excavation	5,700	CY	\$120	\$684,000
	Asphalt Concrete Pavement (ACP)	1,700	tons	\$180	\$306,000
	Asphalt Concrete Base (ACB)	2,500	CY	\$360	\$900,000
	Aggregate Subbase	2,500	CY	\$120	\$300,000
	Noise Barrier	1,000	LF	\$50	\$50,000
	Shoulder Stabilization, Erosion Control	1	LS	\$50,000	\$50,000
	Drainage Improvements	1	LS	\$100,000	\$100,000
				<i>Subtotal Road Improvements</i>	\$2,490,000
Utility Improvements					
	Power/Telephone Pole Relocation/Installation	12	Ea	\$5,000	\$60,000
	Construct Water Supply Line to Driveway 3				
	Unclassified Excavation	600	CY	\$50	\$30,000
	Backfill	600	CY	\$80	\$48,000
	12-inch Pipe	1,261	LF	\$150	\$190,000
	Booster Pump Station	1	LS	\$750,000	\$750,000
				<i>Subtotal Utility Improvements</i>	\$1,078,000
Roberts Hawaii Driveway / Kūhiō Highway Intersection Improvements^a					
	Signalization	1	LS	\$1,000,000	\$1,000,000
	Widen roadways and repave				
	Unclassified Excavation	900	CY	\$120	\$108,000
	Asphalt Concrete Pavement (ACP)	300	tons	\$180	\$54,000
	Asphalt Concrete Base (ACB)	400	CY	\$360	\$144,000
	Aggregate Subbase	400	CY	\$120	\$48,000
	Construct ADA-accessible pedestrian ramps	2	EA	\$10,000	\$20,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$30,000	\$30,000
				<i>Subtotal Intersection Improvements</i>	\$1,404,000
Driveway 3					
	Chain-link fence	15,000	LF	\$50	\$750,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	40	Ea	\$5,000	\$200,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	3,400	CY	\$50	\$170,000
	Backfill	3,400	CY	\$80	\$272,000
	12-inch Pipe	7,500	LF	\$150	\$1,125,000
	New pavement & road widening				
	Unclassified Excavation	10,400	CY	\$120	\$1,248,000
	Asphalt Concrete Pavement (ACP)	3,000	tons	\$180	\$540,000
	Asphalt Concrete Base (ACB)	4,500	CY	\$360	\$1,620,000
	Aggregate Subbase	4,500	CY	\$120	\$540,000
	Noise Barrier	1,500	LF	\$50	\$75,000
	Gate Relocation	3	EA	\$1,500	\$5,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$125,000	\$125,000
				<i>Subtotal Driveway 1 Improvements</i>	\$6,670,000
Permitting					
					\$50,000
Subtotal - Route D3					
					\$11,692,000
	Contingency (25%)				\$2,923,000
Total Cost - Access Route D3					
					\$14,615,000

^a Should the Koheha Loa project (a potential residential development across the highway from the Roberts Hawaii Driveway intersection) proceed, it is expected to have a much larger traffic impact to this intersection than the proposed project. Therefore, the Koheha Loa project may end up bearing the cost of signalization of this intersection.

3.7 KAUA'I BEACH DRIVE ACCESS (E3)

3.7.1 Existing Conditions and Improvements

The Kaua'i Beach Drive access is shown on Figure 4 as Route E3. The access route starts at Kūhiō Highway across from Kaua'i Beach Drive and intersects with Laulima Street, at which point the route follows the Laulima Street access to the landfill. If the alternate RRP site is implemented, then a portion of either Driveway 1 (approximately 1,913 linear feet) or Driveway 2 (approximately 4,865 linear feet) would be used to connect the Landfill site to the RRP site. The Kaua'i Beach Drive access is owned by Visionary LLC and Grove Farm Co., Inc. The existing access is an unimproved road with a gate; there are no defined lane widths or shoulder widths.

The proposed improvements to the Kaua'i Beach Drive access, which must conform to County of Kaua'i requirements, are:

- Acquire additional ROW
- Widen roads and pave: 12-ft lanes with 4-ft shoulders; 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Stabilize shoulders and provide erosion control
- Provide drainage improvements (shoulder swales, culverts, drainage outfalls)

3.7.1.1 UTILITY IMPROVEMENTS

The nearest water connection is the 12-inch main along Kūhiō Highway at the intersection of Laulima Street. Although an existing 8-inch sewer main runs west along Kūhiō Highway, it is recommended that cesspools be installed at the facility instead. Electricity and telephone service is also available at the intersection of Laulima Street and Kūhiō Highway. Additionally, a 12-inch waterline may require relocating to satisfy the minimum cover requirements. Recommended utility improvements to the Kaua'i Beach Drive access route are as follows:

- Construct power and telephone poles along Laulima Street to Driveway 3
- Connect water along Laulima Street to Driveway 3
- Kaua'i Beach Drive / Kūhiō Highway Intersection

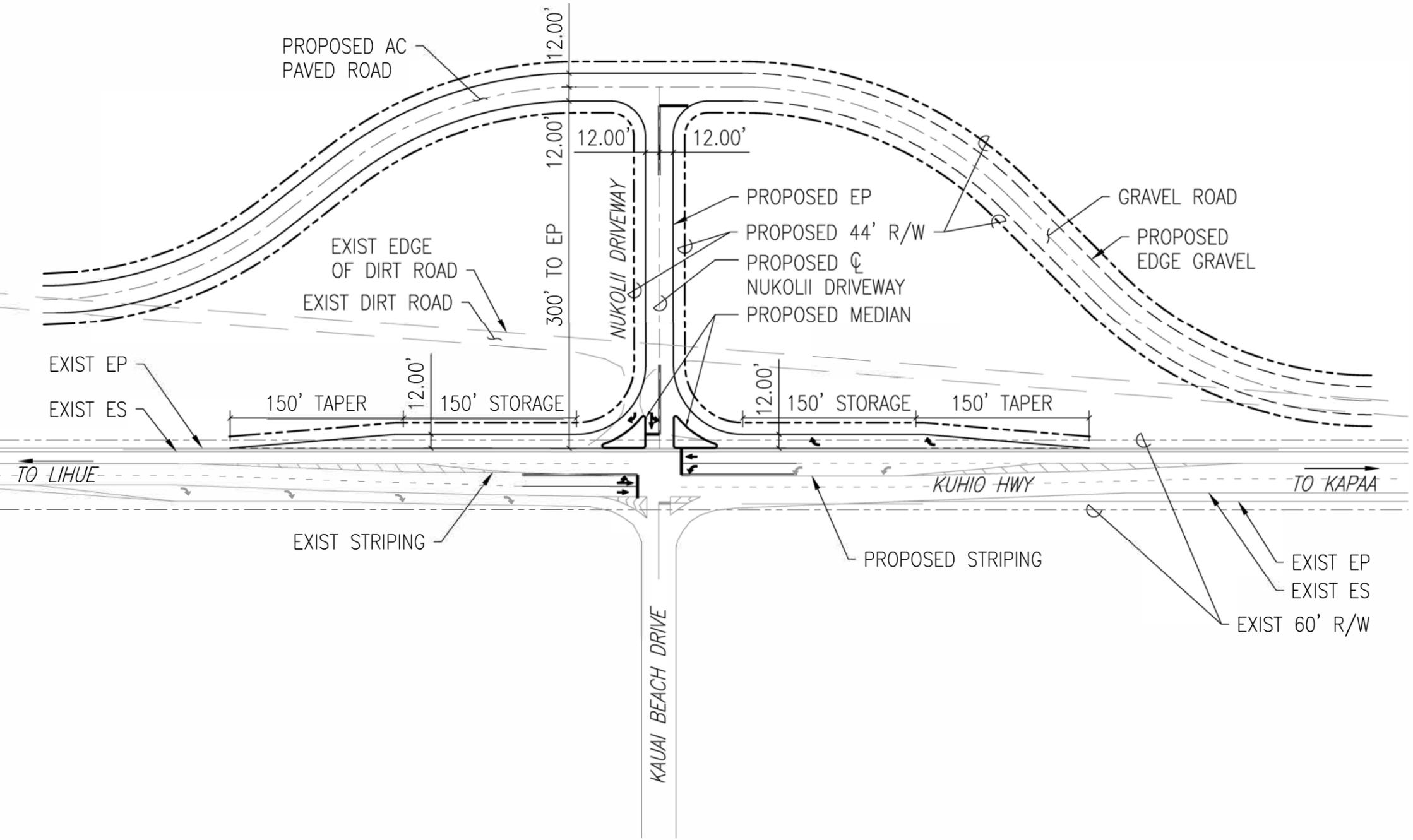
The Kaua'i Beach Dr. / Kūhiō Highway intersection is a 3-way, unsignalized intersection. The State DOT ROW is 60 ft wide. The existing intersection can accommodate WB-40 truck-turning movements. The existing pavement sections could not be found from as-built records.

Based on discussions with the State DOT regarding this access route to the landfill, coordination is required with the anticipated Līhu'e bypass project.

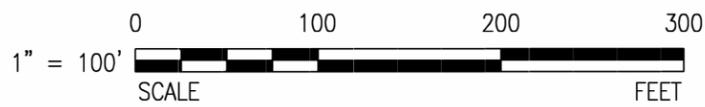
The proposed intersection layout is shown on Figure 14.

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TMK: 3-8-002-003
VISIONARY LLC



PLAN – INTERSECTION OF NUKOLII DRIVEWAY & KUHIO HWY
SCALE: 1" = 100'



KEY MAP



NOTES

SOURCE: GOOGLE EARTH
DATE: 10-10-2013



Figure 14
Plan of Kauai Beach Drive /
Kūhiō Highway Intersection
New Kauai Landfill Traffic and Roadways
Engineering Feasibility Study

Proposed improvements to the Kaua'i Beach Drive / Kūhiō Highway intersection are:

- Signalize the intersection
- Widen roads and pave: 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
 - Right-turn lane in southbound direction on Kūhiō Highway: 12-ft lane, 150-ft storage length, 150-ft taper length
 - Right-turn lane on Kaua'i Beach Drive onto Kūhiō Highway in southbound direction: 12-ft lane, 150-ft storage length, 150-ft taper length
- Construct 2 raised median islands with ADA-accessible pedestrian ramps
- Acquire additional ROW land (including survey maps)

Upon implementation of the proposed improvements, all turning movements at the proposed intersection would accommodate the WB-40 design vehicle.

3.7.1.2 DRIVEWAY 3

Driveway 3 connects Lualima Street to the proposed project site.

Proposed improvements to the driveway are similar to those proposed for Access Route D, which uses much of the same driveway:

- Stabilize shoulders and provide erosion control
- Provide chain-link fence on both sides of the driveway
- Provide noise barrier on side fronting residential housing
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase
- Acquire additional ROW land (including survey maps)

3.7.1.3 DRIVEWAY 1 OR 2

If the alternate RRP site is implemented, then a portion of one of the following two alternatives will be used to connect the Landfill site to the RRP site:

- Approximately 1,913 linear feet of Driveway 1
- Approximately 4,965 linear feet of Driveway 2

Driveway 1 is a direct route to the RRP site that crosses two existing culverts in the vicinity of offsite wetlands. If selected as the proposed-project access route, this route will require wetland mitigation measures, as described above in Section 3.3.1.7. Driveway 2 is an alternate, longer route that bypasses the culverts and wetland area, but may have more impact on use of the parcel.

Proposed improvements to the selected driveway are the same as those proposed for Access Route D:

- Provide chain-link fence on both sides of the driveway
- Establish utility corridors to bring water, electricity, and phones to the proposed project site
- Provide new pavement (including road widening): 2 inches ACP, 6 inches ACB, 6 inches aggregate subbase

- Widen and relocate gate
- For Driveway 1 only: Reconstruct culverts connecting portions of the offsite wetlands, widen the road into the wetlands, and provide wetlands consultation, permitting, and mitigation
- Acquire additional ROW land (including survey maps)

3.7.2 Permitting, Land Use, and Land Acquisitions

The Kaua'i Beach Drive access is zoned as Residential and Industrial. The ROW acquisitions described above are on properties currently zoned as Residential and Industrial. The property owners of the ROW acquisition areas are Visionary LLC and Grove Farm Co., Inc. Estimated time for rezoning and ROW acquisition is 12 months.

The proposed improvements described above will require an NPDES Form C permit from the State DOH. Estimated time for approval from DOH is 6 months.

3.7.3 Planning-Level Cost Estimate

Table 16 provides detailed cost estimates for the Kaua'i Beach Drive access route. The planning-level cost estimate is:

- E3: \$17.3 million

Additional costs may be incurred if the Alternate RRP site is chosen (see Section 3.8).

Table 16: Access Route E (Kaua'i Beach Drive) Detailed Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Costs
Kaua'i Beach Dr. Roadway Improvements					
	ROW acquisition	1	LS	\$200,000	\$200,000
	Widen roadways and repave				
	Unclassified Excavation	11,100	CY	\$120	\$1,332,000
	Asphalt Concrete Pavement (ACP)	3,200	tons	\$180	\$576,000
	Asphalt Concrete Base (ACB)	4,800	CY	\$360	\$1,728,000
	Aggregate Subbase	4,800	CY	\$120	\$576,000
	Shoulder Stabilization, Erosion Control	1	LS	\$50,000	\$50,000
	Drainage Improvements	1	LS	\$100,000	\$100,000
		Subtotal Road Improvements			\$4,562,000
Utility Improvements					
	Power/Telephone Pole Relocation/Installation	12	Ea	\$5,000	\$60,000
	Construct Water Supply Line to Driveway 3				
	Unclassified Excavation	600	CY	\$50	\$30,000
	Backfill	600	CY	\$80	\$48,000
	12-inch Pipe	1,261	LF	\$150	\$190,000
	Booster Pump Station	1	LS	\$750,000	\$750,000
		Subtotal Utility Improvements			\$1,078,000
Kaua'i Beach Dr. / Kūhiō Highway Intersection Improvements^a					
	Signalization/lanes/painting	1	LS	\$1,000,000	\$1,000,000
	Widen roadways and repave				
	Unclassified Excavation	900	CY	\$120	\$108,000
	Asphalt Concrete Pavement (ACP)	300	tons	\$180	\$54,000
	Asphalt Concrete Base (ACB)	400	CY	\$360	\$144,000
	Aggregate Subbase	400	CY	\$120	\$48,000
	Construct raised median islands with ADA-accessible pedestrian ramp	2	EA	\$40,000	\$80,000
	Gate Relocation	2	EA	\$1,500	\$3,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$60,000	\$60,000
		Subtotal Intersection Improvements			\$1,497,000
Driveway 3					
	Chain-link fence	15,000	LF	\$50	\$750,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	40	Ea	\$5,000	\$200,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	3,400	CY	\$50	\$170,000
	Backfill	3,400	CY	\$80	\$272,000
	12-inch Pipe	7,500	LF	\$150	\$1,125,000
	New pavement & road widening				
	Unclassified Excavation	10,400	CY	\$120	\$1,248,000
	Asphalt Concrete Pavement (ACP)	3,000	tons	\$180	\$540,000
	Asphalt Concrete Base (ACB)	4,500	CY	\$360	\$1,620,000
	Aggregate Subbase	4,500	CY	\$120	\$540,000
	Noise Barrier	1,500	LF	\$50	\$75,000
	Gate Relocation	3	EA	\$1,500	\$5,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$125,000	\$125,000
		Subtotal Driveway 1 Improvements			\$6,670,000
Permitting					
					\$50,000
Subtotal - Route E3					
					\$13,857,000
	Contingency (25%)				\$3,464,000
Total Cost - Access Route E3					
					\$17,321,000

3.8 ALTERNATE RRP SITE ACCESS ROUTE

If the alternate RRP site is implemented, then additional costs may be required to connect the MSWLF and RRP sites via a portion of Driveway 1 or 2. Those additional costs are shown in Table 17 (Driveway 1) and Table 18 (Driveway 2).

Table 17: Detailed Cost Estimate for Portion of Driveway 1 Connecting Proposed Project to Alternate RRP Site

Item	Description	Qty	Unit	Unit Cost	Costs
Driveway 1					
	Chain-link fence	10,120	LF	\$50	\$506,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	10	Ea	\$5,000	\$50,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	2,300	CY	\$50	\$115,000
	Backfill	2,300	CY	\$80	\$184,000
	12-inch Pipe	5,060	LF	\$150	\$759,000
	New pavement & road widening				
	Unclassified Excavation	7,000	CY	\$120	\$840,000
	Asphalt Concrete Pavement (ACP)	2,000	tons	\$180	\$360,000
	Asphalt Concrete Base (ACB)	3,000	CY	\$360	\$1,080,000
	Aggregate Subbase	3,000	CY	\$120	\$360,000
	Relocate/widen Double-swing gate	1	Ea	\$1,500	\$1,500
	Reconstruct existing culverts	2	Ea	\$10,000	\$20,000
	Wetlands consultation, permitting, and mitigation	1	Ea	\$1,000,000	\$1,000,000
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$75,000	\$75,000
				<i>Subtotal Driveway 1 Improvements</i>	\$5,350,500
Permitting					
					\$50,000
Subtotal - Portion of Driveway 1					\$5,401,000
	Contingency (25%)				\$1,351,000
Total Cost - Portion of Driveway 1					\$6,752,000

Note: This cost applies only if the alternate RRP site is implemented and the portion of Driveway 1 is selected as the connecting route.

Table 18: Detailed Cost Estimate for Portion of Driveway 2 Connecting Proposed Project to Alternate RRP Site

Item	Description	Qty	Unit	Unit Cost	Costs
Driveway 2					
	Chain-link fence	9,720	LF	\$50	\$486,000
	Utility corridors (water, wastewater, electricity, and phones)				
	Power/Telephone Pole Installation	30	Ea	\$5,000	\$150,000
	Construct Water Supply Line to Project Site				
	Unclassified Excavation	2,200	CY	\$50	\$110,000
	Backfill	2,200	CY	\$80	\$176,000
	12-inch Pipe	4,860	LF	\$150	\$729,000
	New pavement & road widening				
	Unclassified Excavation	6,800	CY	\$120	\$816,000
	Asphalt Concrete Pavement (ACP)	2,000	tons	\$180	\$360,000
	Asphalt Concrete Base (ACB)	2,900	CY	\$360	\$1,044,000
	Aggregate Subbase	2,900	CY	\$120	\$348,000
	Relocate/widen Double-swing gate	1	Ea	\$1,500	\$1,500
	ROW Land Acquisition (Including Survey Maps)	1	LS	\$75,000	\$75,000
				<i>Subtotal Driveway 1 Improvements</i>	\$4,295,500
Permitting					\$50,000
Subtotal - Portion of Driveway 2					\$4,346,000
	Contingency (25%)				\$1,087,000
Total Cost - Portion of Driveway 2					\$5,433,000

Note: This cost applies only if the alternate RRP site is implemented and the portion of Driveway 2 is selected as the connecting route.

3.9 INFRASTRUCTURE IMPROVEMENTS SUMMARY AND CONCLUSION

The significant infrastructure improvements recommended for the five access routes are summarized in Section 5.0. The planning-level cost estimate summary for the potential project access routes is presented in Table 19, sorted by total cost.

Table 19: Summary of the Planning-Level Cost Estimates for the Potential Project Access Routes

Access Route	Estimated Cost (\$ million)	
	Base Cost Estimate	With 25% Contingency
C3: Lualima Road and Driveway 3	10.2 ^a	12.7 ^a
D3: Roberts Hawaii Driveway and Driveway 3	11.7 ^a	14.6 ^a
E3: Kaua'i Beach Drive and Driveway 3	13.9 ^a	17.3 ^a
A2: Ma'alo Road and Driveway 2	33.1	41.4
B2: 'Ehiku Street and Driveway 2	33.5	41.8
A1: Ma'alo Road and Driveway 1	34.3	42.8
B1: 'Ehiku Street and Driveway 1	34.6	43.3

Note: Cost estimates for Routes A, B, and D do not include recommended signalization at Lualima.

^a If the alternate RRP site is implemented, then additional cost for developing a portion of Driveway 1 or 2 to connect to it the project site would be:

Driveway 1: Base Cost \$5.4 million, with 25% Contingency \$6.8 million

Driveway 2: Base Cost \$4.3 million, with 25% Contingency \$5.4 million

Based on the planning-level cost estimates, the Lualima Street access has the lowest expected cost, followed by the Roberts Hawaii Driveway Access and Kaua'i Beach Drive. The Lualima Street access also has the shortest and most direct route between Kūhiō Highway and the project (1.7 miles), again followed closely by the Roberts Hawaii Driveway Access and Kaua'i Beach Drive, resulting in less pavement and utility improvement costs (and future fuel consumption for waste transport) compared to the other routes.

The Lualima Street access route (C3) is the shortest and most direct, implementable, feasible, and cost-effective project access alternative. The Roberts Hawaii Driveway (D3) and Kaua'i Beach Driveway (E3) access routes are the next best routes, respectively, according to the infrastructure improvements assessment criteria (Routes A or B would cost approximately three times as much as Route C, and involve much more construction). Routes C, D, and E are also located on private land.

4.0 SOCIAL IMPACTS ASSESSMENT

4.1 INTRODUCTION AND PURPOSE

This Social Impacts Assessment (SIA) of potential access route alternatives was conducted to assist the County in decision making, and for input to the EIS. The assessment of the potential for traffic-associated social impacts included the solicitation of public comments and the consideration of factors such as public safety and nuisance concerns. The SIA also includes an assessment of environmental and land use entitlements, including ROW and other landowner-related issues associated with each of the potential access roads and driveway alternatives.

The SIA was designed to solicit feedback from affected communities. Community members, stakeholders, and landowners near the potential access routes for the MSWLF and RRP at Ma'alo were provided with a preliminary analysis of the potential access routes (in the form of the draft version of this TREFS report), and asked to provide their comments and concerns.

4.2 PUBLIC OUTREACH

The County conducted a variety of public outreach efforts, utilizing various media to inform the public. The material presented in this SIA was developed from several sources and was conducted in three phases:

1. During the proposed MSWLF and RRP EIS process:
 - Between October 5 and November 6, 2012, 26 interviews were conducted with people identified as stakeholders on Kaua'i for the overall proposed Landfill and RRP project as part of the EIS. These initial interviews were focused on identifying issues that should be addressed during preparation of the EIS for the proposed landfill and RRP. One of the issues identified by the stakeholders was the choice of access route, which emerged as a significant public concern. These interviews, along with other feedback gathered during the EIS process, alerted the County to the public's concerns about the access routes. In response to these concerns, the County decided to conduct this TREFS study, including this SIA for the TREFS, to analyze potential access routes and solicit public comments and feedback on the various alternatives that can connect Kūhiō Highway to the proposed project site. Several comments relating to access road issues were extracted from these initial interviews and are included in this SIA.
2. During preparation of the Draft TREFS report:
 - A second set of stakeholders was identified that included people and organizations considered likely to be able to identify issues related to the access road alternatives. Multiple attempts were made to contact all of these stakeholders. As a result, three interviews were conducted between September 26 and October 10, 2013. An additional interview was conducted with the District Manager, Hawai'i DOT, Highways Division. Their comments and concerns were noted for consideration in the Draft TREFS report, and in this SIA.
3. Following completion of the Draft TREFS report, which was published to the County website for public review on January 12, 2014:
 - A third set of stakeholders representing communities, businesses, and other entities were contacted for interviews.
 - A public outreach effort was conducted to present preliminary findings and gather comments and concerns on potential access routes, via a fact sheet and public comments sheet (Appendix C.2). The fact sheet provided information for the public to consider, including maps showing the locations of the alternative access roads and driveways, and summaries of the technical findings from the traffic and engineering

analysis conducted for the Draft TREFS report. An accompanying public comment sheet was distributed for people to provide their evaluations of the access route alternatives. The comment sheet publicized the availability of the Draft TREFS report, explained the purpose of the fact and comment sheets, and provided instructions for completing and returning the comment sheets via mail or email.

A list of private property owners with parcels located adjacent to or near the potential access routes was prepared. The properties were located in three communities: Isenberg, Laukona, and Hanamā'ulu. The fact and comment sheets were mailed to 119 landowners representing 144 parcels on January 17, 2014 (several owners owned more than one parcel in the area). One of the mailed packages was returned as undeliverable.

- A public meeting was held at the King Kaumuali'i School Cafeteria in the Hanamā'ulu community on January 16, 2014. The meeting was well publicized ahead of time, including radio ads, newspaper ads, and community fliers. Approximately 59 people attended. The majority of attendees were residents of the communities near the alternative access routes. The meeting began at 6:00 pm and ended at 8:35 pm, after all comments regarding the access routes had been voiced. The welcome, introductions, and consultants' presentation ended at 6:35 pm. The remainder of the time was spent gathering resident opinions and comments. Comments expressed during the meeting that related to the access route alternatives were summarized (Appendix C.1) and considered in this SIA.

Attendees were informed of various means of providing their feedback. Materials were prepared to inform and gather written comments related to the access roads from the public. The fact and comment sheets described above were handed out to people who attended the public meeting and made available on the County Website for use by the general public.

Additional documentation of the public outreach process is provided in Appendix C:

- Appendix C.1 presents a summary of the January 16, 2014 public meeting.
- Appendix C.2 presents the access routes fact sheet and public comment sheet.
- Appendix C.3 presents written public comments received via mail or email.
- Appendix C.4 presents summaries of interviews conducted.

4.2.1 Response Rates

Many of the public comments were obtained from the standard sources for SIAs: key stakeholder interviews and public meetings. In addition, this SIA went a step further to contact property owners whose properties were near the alternative access routes. Nevertheless, the total response set (Appendices C.3 and C.4) was quite small. Three landowners and a representative from the state DOT were contacted during the preparation of the initial SIA. All three responded and were interviewed. From the list of stakeholders prepared for the access road assessment, only two accepted the offer to be interviewed. At least 59 people attended the public meeting on January 16. Finally, between the attendees of the public meeting and the 118 property owners who were mailed surveys asking for their input, 10 returned completed forms or otherwise sent written or emailed responses.

As is often the case for SIA data collection, negative comments tended to outnumber positive comments. The system is established to identify as many issues as possible related to a proposed project. The SIA of the Ma'alo site remained relatively positive. Members of the community pointed out that the landfill operation must be safe and clean, and not unsightly or damaging to the

environment. However, over 70 percent of the stakeholders interviewed also said that the Ma'alo site was probably the best alternative for the County and its people.

The public meeting and survey of nearby landowners were designed to gather data from persons most affected by the alternative access routes. Therefore, respondents tended to highlight localized, rather than island-wide, issues associated with individual access routes.

4.3 COMMENTS AND RESPONSES

Based on all the outreach efforts, the following comments were obtained:

- Comments made during the January 16, 2014 public outreach meeting (Appendix C.1)
- Nine written responses via completed forms and emails (Appendix C.3)
- Comments during interviews (Appendix C.4)

The comments received were grouped by route and are provided below. While some comments stand on their own for County consideration (and do not require a response), responses are provided where appropriate. The origin of each comment is denoted as follows:

Pre = pre-public meeting comments gathered from stakeholder and landowner interviews

PM = comments gathered at the Public Meeting

OR = comments from outreach activities conducted after the public meeting

4.3.1 Access Route A Comments and Responses

4.3.1.1 ROUTE A PERCEIVED ADVANTAGES

1. Some felt that Ma'alo Road is preferable because it already exists, and also that it may be the least expensive route to the site. (Pre, PM, OR)
 - *Response:* The estimated cost of preparing Ma'alo Road for service as the access road is between \$41.4 and \$42.8 million, which is the second highest of the five routes under investigation, and significantly more expensive than Routes C or D.
2. Ma'alo Road does not pass through or near any residential neighborhood. (Pre, PM, OR)
3. Owners of non-residential properties near the Makai end of the road have not registered any objections. (Pre)
4. Roadway improvements will benefit other users of Ma'alo Road. (Pre, PM, OR)
 - *Response:* Anticipated roadway improvements include improvements to the highway intersection (including signalization), widening of both Ma'alo Road and the small bridge, and straightening a sharp curve.

4.3.1.2 ROUTE A PERCEIVED DISADVANTAGES

1. Impacts to traffic conditions at the intersection of Ma'alo Road and Kūhiō Highway, including delays, safety, limited visibility, congestion. (Pre, OR)
 - *Response:* The TREFS report describes recommended mitigation measures to address these concerns, including signalization, lane relocation, etc.
2. The cost of improvements to the Kūhiō Highway intersection. (Pre, OR)
 - *Response:* The overall estimated cost of preparing Ma'alo Road for service as a landfill access road is between \$41.4 and \$42.8 million, which is the second highest of the five routes under investigation, and significantly more expensive than Routes C or D.

3. Possible development delays due to traffic improvements at that intersection. (Pre)
4. Making the road safe and functional for truck traffic may require the acquisition of rights of way and that may add substantial cost and delays in the proposed project schedule. (Pre)
 - *Response:* Section 2.0 of the TREFS report describes those areas in which ROWs may need to be acquired, and the cost estimates reflect these requirements.
5. Signalization would be required. (Pre)
 - *Response:* Signalization of the Ma'alo Road-Kūhiō Highway intersection is recommended should Route A be the proposed access route.
6. Dust at the Makai end of the road may affect commercial operations in that area. (Pre)
 - *Response:* All roadways would be paved, waste-hauling trucks are required to cover loads, and the landfill would have truck-tire cleaning devices near the exit. Unusual levels of dust are therefore not expected.
7. Truck traffic along Ma'alo Road might negatively affect the visitor experience of those riding a tour bus to Wailua Falls. (Pre, OR)
 - *Response:* No study of visitor reactions to the access routes was conducted.

4.3.2 Access Route B Comments and Responses

4.3.2.1 ROUTE B PERCEIVED ADVANTAGES

1. 'Ehiku Street avoids the cost of improvements along lower Ma'alo Road. (Pre, OR)
 - *Response:* Route B would require improvements to 'Ehiku Street, offsetting the gain by avoiding improvements to lower Ma'alo Road.
2. Fewer improvements would be required for the intersection at 'Ehiku Street and Kūhiō Highway, reducing cost and delay. (Pre)
 - *Response:* Although minor improvements would be required at the Kūhiō Highway intersection, the overall cost estimate for Route B is estimated at \$41.8 to \$43.3 million, the highest cost estimate among the five alternative access routes.
3. Required roadway improvements will benefit other users of 'Ehiku Street. (Pre)
4. Visitor traffic to Wailua Falls could make use of 'Ehiku, enhancing the visitor experience. (Pre)

4.3.2.2 ROUTE B PERCEIVED DISADVANTAGES

1. 'Ehiku Street runs through the Isenberg residential neighborhood, and is immediately adjacent to homes, churches, and businesses. Neighborhood opposition has been voiced. The neighborhood has expressed concerns regarding dust, odor, noise, safety issues for children, and difficulty accessing 'Ehiku Street from their driveways. (Pre, PM, OR)
 - *Response:* The County acknowledges the impacts to nearby properties if this route were chosen. In order to mitigate impacts, noise dampening and dust suppression measures can be implemented, and safety precautions could be undertaken.
2. Truck traffic at the intersection of 'Ehiku Street and Kūhiō Highway could cause delays at a problem-free intersection. (Pre, OR)
 - *Response:* Improvements to the 'Ehiku Street / Kūhiō Highway intersection, including extra lanes and turn-radius widening, are recommended if this intersection is chosen.

The traffic study performed in the TREFS, which included data collection and traffic impacts analysis, did not suggest a change in the LOS (see Section 2.0).

3. If additional lanes were needed, it may be necessary to acquire rights of way. (Pre)
 - *Response:* Section 2.0 of the TREFS report describes those areas in which ROWs may need to be acquired, and the cost estimates reflect these requirements.
4. Some felt 'Ehiku Street would be the most expensive of the alternative access routes. (Pre, OR)
 - *Response:* Although minor improvements would be required at the Kūhiō Highway intersection, the overall cost estimate for Route B is estimated at \$41.8 to \$43.3 million, the highest cost estimate among the five alternative access routes.
5. Enhancing the visitor experience would be offset by the need to mix solid waste hauling and tour bus traffic along 'Ehiku Street and upper Ma'alo Road. (Pre)
 - *Response:* No study of visitor reactions to the access routes was conducted.

4.3.3 Access Route C Comments and Responses

4.3.3.1 ROUTE C PERCEIVED ADVANTAGES

1. Laulima Street is the shortest and most direct route to the site. (Pre, PM, OR)
2. Route C is the least expensive of the alternative routes. (Pre, PM, OR)
 - *Response:* Route C has the lowest estimated development cost, \$12.7 million.
3. Laulima Street does not pass through any residential neighborhood. (Pre, PM)
 - *Response:* Laulima Street does not pass through any residential neighborhood. It does pass behind the backyards of some residential properties along Laukona Street.
4. Much of the route along Laulima is not visible from Kūhiō Highway. (Pre)
5. Required improvements to the intersection at Laulima and Kūhiō Highway, including the traffic signal, once warranted, would benefit local residents and all drivers using Kūhiō Highway during peak traffic periods. (Pre, PM, OR)
 - *Response:* As described in the Traffic Analysis, signalization of the intersection would be expected to improve the level of service at the intersection.
6. There is ample land along Kūhiō Highway to add turn lanes. (Pre)

4.3.3.2 ROUTE C PERCEIVED DISADVANTAGES

1. The impact of truck traffic at the intersection of Laulima Street and Kūhiō Highway, already a congested area, would cause major traffic problems. (Pre, PM)
 - *Response:* Improvements to the intersection at Laulima Street and Kūhiō Highway, including turn lanes, roadway widening, and signalization, are expected to mitigate impacts to the intersection, and even result in net improvements for some approaches (see Section 2.0).
2. Bringing trucks to the center of Hanamā'ulu town would cause problems with dust, odor, and noise even with the best improvements to the intersection. (Pre, PM)
 - *Response:* Provisions for reducing noise, odor, and dust associated with solid waste transport will be implemented, as discussed in responses above, and are not expected to significantly change existing conditions along the highway (which already is used by many waste haulers today). Some of the roadway improvements have the potential to

- improve existing conditions, e.g., paving the existing cane-haul roads. Finally, mitigation measures such as landscaping or a sound wall can be implemented to further reduce noise, odor, and dust impacts.
3. Trucks may raise dust that would affect operations in the commercial area. (Pre)
 - *Response:* Provisions for reducing dust associated with solid waste transport will be implemented, as discussed in responses above, and are not expected to significantly change existing conditions along the highway (which already is used by many waste haulers today). Some of the roadway improvements have the potential to improve existing conditions, e.g., paving the existing cane-haul roads.
 4. The part of Route C that runs parallel to Laukona Street is adjacent to the property of homeowners along that street. Dust, noise, and odor may be problems for residents there. (Pre, PM, OR)
 - *Response:* A portion of Access Route C passes behind the backyards of some residential properties along Laukona Street. Mitigation measures to address dust, noise, and odor (for example, paving the existing cane haul road, a sound wall, or berm and vegetative barrier) could be implemented.
 5. Some felt that the Laulima Street route would be expensive to develop. (Pre)
 - *Response:* The cost estimate for developing Route C is \$12.7 million, the lowest estimate among the five alternative routes.
 6. Route C will decrease property values on Laukona Street. (PM)
 - *Response:* Route C does not run along Laukona Street, it runs 200 feet or more from Laukona Street properties' back yards. With appropriate landscaping and roadway paving, the impact of property values could be mitigated.
 7. Laukona Street is an area particularly affected by excessive runoff or flooding. (PM, OR)

Laukona Street is affected by flooding due to the breakdown or blockage of the stream/ditch between Laukona and the cane haul road that would become Route C. (PM)

 - *Response:* The detailed design of the access route would investigate and account for runoff and flooding, in accordance with County and other requirements. If any current drainage problems are caused by features near the roadways, then the drainage improvements associated with roadway development may alleviate existing problems.

4.3.4 Access Route D Comments and Responses

Routes C and D share the same "driveway" (i.e., Driveway 3) from the intersection of Laulima Street and the Roberts Hawaii Driveway to the site. Therefore, the two routes share many of the same advantages and disadvantages, and many of the comments and responses above also apply to Route D.

4.3.4.1 ROUTE D PERCEIVED ADVANTAGES

8. Roberts Hawaii Driveway avoids putting further pressure on the intersection at Laulima Street and Kūhiō Highway. (Pre, OR)
9. Route D has no negative impact on visitor traffic to Wailua Falls. (Pre)
10. Route D bypasses the commercial area, reducing or limiting problems for businesses there. (Pre)
11. Required improvements to Route D may benefit other residents and businesses in Hanamā'ulu. (Pre, OR)

12. Route D is farthest from Hanamā'ulu town and has less foot traffic than other routes.

4.3.4.2 ROUTE D PERCEIVED DISADVANTAGES

1. The intersection of Roberts Hawaii Driveway and Kūhiō Highway is very near the intersection of Kūhiō Highway and Kapule Highway. That may cause major traffic delays in peak periods. (Pre, OR)
 - *Response:* Improvements to the intersection, including additional lanes and signalization, are recommended if this route is chosen. Additionally, pending Hawai'i DOT concurrence with the analysis presented in this TREFS, there appears to be sufficient distance to coordinate the signals at the two intersections.
2. The Roberts Hawai'i Driveway runs along the back side of Kalepa Villages and may cause dust, noise, or odor problems for residents there. (Pre, OR)
 - *Response:* Landscaping or other mitigation measures could reduce the impact of truck traffic behind Kalepa Village residences.
3. The part of the route that runs parallel to Laukona Street is adjacent to the property of homeowners along that street. Dust, noise, and odor may be a problem for residents there. (Pre, PM)
 - *Response:* A portion of Access Route D passes behind the backyards of some residential properties along Laukona Street. Mitigation measures to address dust, noise, and odor could be implemented (for example, paving the existing cane haul road, requiring trucks to cover loads, installing a sound or vegetative barrier).
4. Some felt that, with the addition of Roberts Hawaii Driveway to Route C, the new Route D would make it one of the most costly to develop.
 - *Response:* The estimated cost for preparing Route D is \$14.6 million, the second lowest of the five alternative access routes.

4.3.5 Access Route E Comments and Responses

[Public outreach pending; September–October 2016]

4.3.5.1 ROUTE D PERCEIVED ADVANTAGES

1. [Public outreach pending; September–October 2016]

4.3.5.2 ROUTE D PERCEIVED DISADVANTAGES

2. [Public outreach pending; September–October 2016]

4.3.6 Driveway-Related Comments and Responses

4.3.6.1 COMMENTS SPECIFIC TO DRIVEWAY 1

1. Driveway 1 is straight and less expensive; Driveway 2 will be more expensive. (Pre)
 - *Response:* Driveway 1 may be the more expensive route because it must pass through a wetlands area.
2. Driveway 1 is shorter; Driveway 2 will add unacceptable lengths to drive times. (Pre)
3. Driveway 1 is less intrusive to agricultural operations in the area; Driveway 2 breaks up the current land use patterns and future land use possibilities. (Pre)

4.3.6.2 COMMENTS SPECIFIC TO DRIVEWAY 2

1. Driveway 1 traverses wetland areas; Driveway 2 is designed to avoid the wetlands. (Pre)
2. Driveway 1 may require lengthy and difficult negotiations with the Federal government; Driveway 2 may avoid those negotiations. (Pre)
 - *Response:* Driveway 1 would likely require consultation, and possibly a Section 404 permit, from the USACE.
3. Driveway 1 may be less popular among members of the community who are sensitive to wetlands issues; Driveway 2 would avoid potential controversy regarding wetlands.

4.3.6.3 COMMENTS SPECIFIC TO DRIVEWAY 3

1. Driveway 3 is straight, direct, and simple in design (PM)
2. Driveway 3 divides the landowner's property and limits flexibility of use; Driveways 1 and 2 avoid these problems. (Pre)
3. Driveway 3 is not directly involved with wetland areas. (Pre)
 - *Response:* Driveway 3 does not pass through wetlands areas. However, if the RRP is located on the alternate site, then a road between the proposed landfill and the alternate RRP site would require a portion of either Driveway 1 (which traverses the wetland) or Driveway 2.

4.3.7 Comments and Responses Related to All Alternatives

4.3.7.1 PERCEIVED COMMON ADVANTAGES

(None noted.)

4.3.7.2 PERCEIVED COMMON DISADVANTAGES

1. Combining Routes: Access Routes A and B approach the landfill from the west, and Access Routes C and D approach from the east. By joining the two, the loop would be completed, creating a fifth alternative access route. (Pre, PM, OR)
 - *Response:* The proposed project, establishment of the proposed landfill and RRP, is already an expensive and complicated project, and the proposed facilities do not require more than one access point. Because providing such would introduce unnecessary complication and expense into the proposed project, this approach is not recommended at this time. Should future conditions warrant, this could then be considered.
2. Hanamā'ulu Bypass Road: Completing the loop produces a route that is similar to some proposals for a Hanamā'ulu Bypass Road. Although people were informed that the bypass road and landfill siting issues were separate issues, many still felt they were the same issues and should be treated as such. (Pre, PM, OR)
 - *Response:* The County is still considering how to best pursue the Hanamā'ulu Bypass Road. However, because it is not required by the landfill or RRP, and would introduce unnecessary complication and expense into this proposed project, the Hanamā'ulu Bypass Road is not part of the proposed project.
3. Alternative Route: An additional route was suggested that runs from the highway along Ma'alo Road to the intersection with 'Ehiku Street, and then turns east along a cane haul road to Driveway 3. (Pre, PM, OR)
 - *Response:* Appendix C.5 presents a figure showing this additional potential route ("Access Route F), and a brief assessment of its advantages and disadvantages.

Although the route may be feasible, it is generally not recommended, as it includes many of the disadvantages of Routes A and B but lacks the advantages associated with Routes C and D.

4.4 SIA CONCLUSIONS

This SIA was conducted to identify issues that the public wants the County to consider in choosing the proposed access route. Community members raised approximately 52 issues, as described above. Although soliciting input for the SIA focused largely on those most closely affected by the choice of access routes, all citizens of Kaua'i are potentially affected by this choice. This analysis provides decision makers with perceived advantages, disadvantages, and other factors to consider in choosing a proposed access route.

Increased traffic at the respective Kūhiō Highway intersection and potential negative impacts from proposed project truck traffic to any nearby residential or commercial areas were issues identified by the public that were common to all access route alternatives.

While the SIA does not identify a 'best choice' among the alternative routes, and no single consideration can be the basis for selecting or rejecting a route, Access Routes C, D, and E provide the best balance of feasibility, traffic impacts, cost requirements, and other impacts, as discussed herein. Furthermore, most community members that expressed a preference between these three routes, particularly nearby residences and businesses, preferred Route E (followed by Route D), because it moves the intersection traffic farthest away from the core of Hanamā'ulu, minimizing traffic impacts there. Whichever route is chosen, impacts associated with the selected route may warrant mitigation, in consultation with the affected public.

5.0 PROPOSED ACCESS ROUTE

This TREFS analyzed five potential access routes from Kūhiō Highway (the principal thoroughfare in the area) to the proposed project (MSWLF and RRP at Ma'alo). The TREFS both analyzed objective data (such as traffic impacts, recommended improvements, and related costs) and solicited concerns and opinions from the public, particularly those most directly affected by the choice of the proposed access route. Several public meetings were held to gather public comments, and additional outreach and engagement was conducted through the internet and local media sources.

All access scenarios present potential traffic impacts that can be addressed via physical and operational improvements at their respective Kūhiō Highway intersection (in several cases, these improvements could improve the existing traffic in these areas). Access route improvements are recommended for all access scenarios, including paving and utility work, bringing water, electricity, and phone lines to the proposed project site, and other roadway improvements. Table 20 summarizes key features of each potential access route and the projected impacts and costs, as presented in the preceding sections.

Overall, Access Routes C, D, and E provide the best balance of feasibility, directness, traffic impacts, cost requirements, and other impacts. While these three routes are progressively longer and therefore more expensive, few other significant technical advantages or disadvantages distinguish routes C, D, and E. However, members of nearby communities expressed a preference for Access Route E, which would minimize the traffic impact to the core of Hanamā'ulu and pass fewer residences and businesses. Therefore, while Route C is slightly preferable from a technical and financial standpoint, in order to address concerns raised by the community during the early planning process, the County has selected Access Route E as the preferred access route, which will become part of the proposed project that will be evaluated in the overall project EIS.

Table 20: Overall Comparison of Proposed-Project Access Routes

Assessment		Ma'alo Road (Route A1, A2)		'Ehiku Street (Route B1, B2)		Laulima Street (Route C3)		Roberts Hawaii Driveway (Route D3)		Kaua'i Beach Drive (Route E3)		Overall Conclusion
Description and Existing Conditions	Route Length	4.8 miles (A1); 4.7 miles (A2)		5.6 miles (B1); 5.7 miles (B2)		1.7 miles		2.2 miles		2.8 miles		Not applicable
	Intersection Type	Stop-sign-controlled T-intersection		Signalized		Stop-sign-controlled four-legged intersection		Stop-sign-controlled T-intersection		Unsignalized with one-way stop control		
	Intersection LOS	C (weekday AM peak) D (weekday PM peak)		A (weekday AM & PM peaks)		E (weekday AM peak) F (weekday PM peak)		D (weekday AM peak) C (weekday PM peak)		F (weekday AM & PM peaks)		
	Key Features	Ma'alo Road is narrow with one narrow bridge near the highway intersection, no shoulders, sharp turns; main route for tourist traffic to Wailua Falls		Route transits residential area (Isenberg neighborhood, from intersection to Kanakolu St)		Intersection is major outlet for Hanamā'ulu community; route briefly parallels a residential area (Laukona St)		Most of the initial "D" segment is a gravel road. Intersection is currently not heavily used, but could be impacted by vehicle queuing for nearby signalized Kapule Hwy intersection		Extends Access Route D an additional 0.7 mile, minimizing traffic impacts to the core of Hanamā'ulu. Route recommended by local residents and businesses during early community outreach efforts		
Traffic (Section 2.0)		Significant impacts to Kūhiō Hwy intersection operations Recommended intersection improvements: <ul style="list-style-type: none"> Signalize intersection when warranted Modify Kūhiō Hwy intersection to accommodate southbound traffic turning right into Ma'alo Rd 		Minor impacts to Kūhiō Hwy intersection operations; potentially significant impacts to residential segment (between Kūhiō Hwy and Kanakolu St) Recommended intersection improvements: <ul style="list-style-type: none"> Modify existing signal operation Enlarge 'Ehiku St right-turn curb return radii Upgrade pedestrian facilities 		Once warranted, signalization of intersection is recommended regardless of which proposed-project access route is used. Recommended intersection improvements: <ul style="list-style-type: none"> Signalize intersection Reconfigure Laulima St mauka approach Widen highway for northbound and southbound left-turn lanes 		Once warranted, signalization is recommended to accommodate vehicle queuing from the nearby signalized Kapule Hwy / Kūhiō Hwy intersection. Recommended intersection improvements: <ul style="list-style-type: none"> Signalize intersection when warranted Provide left-turn lane for Kapa'a-direction Kūhiō Hwy traffic Provide right-turn deceleration lane for LThu'e-direction Kūhiō Hwy traffic 		Signalization is recommended (and already warranted) to accommodate vehicle queuing impacts to the nearby signalized Kapule Hwy / Kūhiō Hwy intersection. Recommended intersection improvements: <ul style="list-style-type: none"> Signalize intersection Provide right-turn deceleration lane for LThu'e-direction Kūhiō Hwy traffic 		Routes C, D, and E (in that order) would provide the most cost-effective and efficient access to the proposed project while minimizing impacts to the traffic operations and adjacent land uses. Route E could improve traffic and safety conditions at the intersection that currently has the worst LOS.
Infrastructure Improvement Requirements (Section 3.0)	Improvements:	Cost for Route A1:	Cost for Route A2:	Cost for Route B1:	Cost for Route B2:	Cost for Route C3:		Cost for Route D3:		Cost for Route E3:		Access Route Route C3 has the least cost and is the shortest and most direct route. Access Routes D and E have similar but progressively increasing costs and distances,
	Roadway	\$9,430,000	\$9,430,000	'Ehiku: \$4,890,000 Ma'alo: \$6,238,000	'Ehiku: \$4,890,000 Ma'alo: \$6,238,000	\$758,000		\$2,490,000		\$4,562,000		
	Driveway	\$10,128,000 ^a	\$8,973,000	\$10,128,000 ^a	\$8,973,000	\$6,670,000		\$6,670,000		\$6,670,000		
	Utility	\$3,185,000	\$3,185,000	\$2,983,000	\$2,983,000	\$1,078,000		\$1,078,000		\$1,078,000		
	Hwy intersection ^c	\$1,322,000	\$1,322,000	\$280,000	\$280,000	\$1,624,000 ^b		\$1,404,000		\$1,497,000		
	Permitting	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000		\$50,000		\$50,000		
	Other	Ma'alo Road / Driveway 1 intersection: \$59,000 Kapaia bridge: \$5,000,000 Existing bridge: \$5,025,000 Existing sharp curve: \$78,000	Ma'alo Road / Driveway 2 intersection: \$59,000 Kapaia bridge: \$5,000,000 Existing bridge: \$5,025,000 Existing sharp curve: \$78,000	Ma'alo Road / Driveway 1 intersection: \$59,000 Reconstruct waterway/culvert: \$10,000,000	Ma'alo Road / Driveway 2 intersection: \$59,000 Reconstruct waterway/culvert: \$10,000,000							
Total Cost^d	\$42,847,000	\$41,403,000	\$43,285,000	\$41,841,250	\$12,725,000^e		\$14,615,000^e		\$17,321,000			

Assessment		Ma'alo Road (Route A1, A2)	'Ehiku Street (Route B1, B2)	Laulima Street (Route C3)	Roberts Hawaii Driveway (Route D3)	Kaua'i Beach Drive (Route E3)	Overall Conclusion
Social Impacts (Section 4.0)	Perceived Advantages:	<ul style="list-style-type: none"> Route is already established. Route avoids residential areas. Roadway and infrastructure improvements would benefit all road users and property owners along the route. 	<ul style="list-style-type: none"> Roadway and infrastructure improvements would benefit all road users and property owners along the route. Required intersection and roadway improvements may be less than for Ma'alo route. Making use of the route for Wailua Falls traffic could enhance the visitor experience. 	<ul style="list-style-type: none"> Shortest, most-direct, least-expensive route to the proposed project site No impact to visitor traffic to Wailua Falls. Intersection improvements would benefit some users 	<ul style="list-style-type: none"> Compared to Route C, avoids more of Hanamā'ulu town and avoids putting additional pressure on Laulima St highway intersection. Second-least expensive alternative. No impact to visitor traffic to Wailua Falls. Roadway and infrastructure improvements would benefit property owners along and near the route. 	<ul style="list-style-type: none"> Minimizes traffic impacts to Hanamā'ulu town. Significantly less expensive than Routes A or B. No impact to visitor traffic to Wailua Falls. Would improve safety and traffic conditions at the highway intersection. 	<p>Increased traffic at the respective Kūhiō Highway intersection and potential negative impacts from proposed project traffic to any nearby residential or commercial areas are social impact issues common to all access route alternatives, but minimized with Access Route E3.</p> <p>As noted by community members during the public outreach process, Route E3 would reduce the traffic impact to the core of Hanamā'ulu, and is therefore preferable.</p>
	Perceived Disadvantages:	<ul style="list-style-type: none"> Increased highway intersection traffic and high cost for intersection improvements, including potential signalization. Increased truck traffic on Ma'alo Rd. Potential for dust for commercial operations along route. Potential negative impacts to Wailua Falls visitors on tour buses. 	<ul style="list-style-type: none"> Potential safety and nuisance impacts along Isenberg residential segment of route (between Kūhiō Hwy and Kanakolu St). Increased traffic at previously problem-free highway intersection. Expensive alternative access route. Mixing solid waste truck and tour bus traffic could offset any enhanced visitor experience. 	<ul style="list-style-type: none"> Increased truck traffic at already-busy highway intersection could cause traffic problems. Potential for increased dust in the commercial area Impacts from truck traffic transiting through center of Hanamā'ulu town, and potential for dust, noise, odor, and other nuisances to Laukona St residents. Drainage ditch next to route segment that is parallel with Laukona St is subject to flooding. 	<ul style="list-style-type: none"> Proximity to nearby Kūhiō Hwy / Kapule Hwy intersection could produce traffic delays. Potential for dust, noise, odor, and other nuisances to Kalepa Village and Laukona St residents. Drainage ditch next to route segment that is parallel with Laukona St may be subject to flooding. 	<ul style="list-style-type: none"> Potential for dust, noise, odor, and other nuisances to Kalepa Village and Laukona St residents. Drainage ditch next to route segment that is parallel with Laukona St may be subject to flooding. More expensive than Access Routes C and D 	

^a Includes \$1,000,000 for wetlands mitigation.

^b Includes \$1,000,000 for signalization of intersection, which is recommended in the long-term future regardless of proposed project implementation or selected proposed-project access route.

^c The cost estimates for Access Routes A, B, and D do not include signalization of the Laulima / Kūhiō Hwy intersection, which is recommended under all scenarios.

^d Total cost includes 25% contingency.

^e If the alternate RRP site is implemented, then additional cost for developing a portion of Driveway 1 or 2 to connect to it the proposed project site would be \$6.8 million (Driveway 1) or \$5.4 million (Driveway 2) (includes 25% contingency).

6.0 REFERENCES

AECOM Technical Services, Inc. 2012. *New Kaua'i Landfill Siting Study Report*. Prepared for County of Kaua'i, Department of Public Works. Honolulu. July.

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Transportation Research Board (TRB). 2010. *Highway Capacity Manual*. National Research Council.

Appendix A
Intersection Volumes

Baseline Scenarios

Year	Intersection (Kūhiō Highway)	Weekday AM Peak Hour												Weekday PM Peak Hour											
		Northbound			Southbound			Eastbound			Westbound			Northbound			Southbound			Eastbound			Westbound		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
Existing	@ 'Ehiku Street	58	537	0	0	979	17	9	0	87	0	0	0	102	923	0	0	871	13	17	0	59	0	0	0
	@ Ma'alo Road	17	365	0	0	833	13	8	0	9	0	0	0	29	834	0	0	610	24	28	0	32	0	0	0
	@ Lāulima Street	4	322	37	13	787	12	3	0	3	56	0	43	4	776	82	15	594	4	7	1	6	34	2	27
	@ Roberts Hawaii Driveway	0	0	0	8	0	1	1	439	0	119	811	12	0	0	0	7	0	11	2	596	0	0	643	9
	@ Kapule Highway	33	311	0	0	884	909	278	0	288	0	0	0	101	1024	0	0	461	551	540	0	63	0	0	0
	@ Kauai Beach Drive	0	621	30	20	1837	0	0	0	0	51	0	13	0	1623	40	39	902	0	0	0	0	88	0	62

Growth Rate (per annum) 1.0%

Opening Year (2020)	@ 'Ehiku Street	62	576	0	0	1050	18	10	0	93	0	0	0	109	990	0	0	934	14	18	0	63	0	0	0
	@ Ma'alo Road	18	391	0	0	893	14	9	0	10	0	0	0	31	894	0	0	654	26	30	0	34	0	0	0
	@ Lāulima Street	4	345	40	14	844	13	3	0	3	60	0	46	4	832	88	16	637	4	8	1	6	36	2	29
	@ Roberts Hawaii Driveway	0	0	0	9	0	1	1	471	0	128	870	13	0	0	0	8	0	12	2	639	0	0	689	10
	@ Kapule Highway	35	333	0	0	948	975	298	0	309	0	0	0	108	1098	0	0	494	591	579	0	68	0	0	0
@ Kauai Beach Drive	0	666	32	21	1970	0	0	0	0	55	0	14	0	1740	43	42	967	0	0	0	0	94	0	66	
Future Year (2040)	@ 'Ehiku Street	76	703	0	0	1281	22	12	0	114	0	0	0	133	1207	0	0	1139	17	22	0	77	0	0	0
	@ Ma'alo Road	22	477	0	0	1090	17	10	0	12	0	0	0	38	1091	0	0	798	31	37	0	42	0	0	0
	@ Lāulima Street	5	421	48	17	1030	16	4	0	4	73	0	56	5	1015	107	20	777	5	9	1	8	44	3	35
	@ Roberts Hawaii Driveway	0	0	0	10	0	1	1	574	0	156	1061	16	0	0	0	9	0	14	3	780	0	0	841	12
	@ Kapule Highway	43	407	0	0	1156	1189	364	0	377	0	0	0	132	1340	0	0	603	721	706	0	82	0	0	0
@ Kauai Beach Drive	0	812	39	26	2403	0	0	0	0	67	0	17	0	2123	52	51	1180	0	0	0	0	115	0	81	

Project Trips

To / from north 45%
To / from south 55%

	Weekday AM Peak Hour								
	To / from north			To / from south			Total		
	In	Out	Total	In	Out	Total	In	Out	Total
Opening Year (2020)									
Landfill	7	7	14	8	8	17	15	15	30
RRP	59	12	70	72	14	86	130	26	156
Landfill + PRP	65	18	84	80	23	102	145	41	186
Future Year (2040)									
Landfill	9	8	17	10	10	20	19	18	37
RRP	59	12	70	72	14	86	130	26	156
Landfill + PRP	67	20	87	82	24	106	149	44	193

	Weekday PM Peak Hour								
	To / from north			To / from south			Total		
	In	Out	Total	In	Out	Total	In	Out	Total
	5	7	12	7	8	15	12	15	27
	10	59	68	12	72	84	22	130	152
	15	65	81	19	80	98	34	145	179
	7	8	15	8	10	18	15	18	33
	10	59	68	12	72	84	22	130	152
	17	67	83	20	81	102	37	148	185

Project Scenarios

Ehiku Street Access Alternative																									
Opening Year Project Trips (Landfill)	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	8	7	7	7	7	8		7	7	5	5	7	8											
Opening Year Project Trips (Landfill + RRP)	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	80	18	65	18	23		19	65	15	65	15	65	80	15										
Future Year Project Trips (Landfill)	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	10	8	9	8	10		8	8	7	7	7	8	10	7										
Future Year Project Trips (Landfill + RRP)	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	82	20	67	20	24		20	67	17	17	17	67	81	17										
Opening Year (2020) + Landfill	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	70	576	0	0	1050	25	16	0	102	0	0	0	116	990	0	0	934	19	25	0	72	0	0	0
Opening Year (2020) + Landfill + RRP	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	142	576	0	0	1050	83	28	0	116	0	0	0	128	990	0	0	934	29	83	0	143	0	0	0
Future Year (2040) + Landfill	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	86	703	0	0	1281	31	20	0	124	0	0	0	142	1207	0	0	1139	24	30	0	87	0	0	0
Future Year (2040) + Landfill + RRP	@ 'Ehiku Street @ Ma'alo Road @ Laulima Street @ Roberts Hawaii Driveway @ Kapule Highway @ Kauai Beach Drive	158	703	0	0	1281	89	32	0	138	0	0	0	154	1207	0	0	1139	34	89	0	159	0	0	0

Ma'alo Road Access Alternative																																								
Opening Year Project Trips (Landfill)	@ 'Ehiku Street	8			8			7			7			8			7			8			5			7			8			5								
	@ Ma'alo Road	8			7			7			8			7			7			7			5			7			8			5								
	@ Laulima Street	7			7			7			7			7			7			7			5			7			8			5								
	@ Roberts Hawaii Driveway	7			7			7			7			7			7			7			5			7			8			5								
	@ Kapule Highway	7			7			7			7			7			7			7			5			7			8			5								
Opening Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	80			23			65			18			23			65			19			19			80			15			65			80			15		
	@ Ma'alo Road	80			23			65			18			23			65			19			19			80			15			65			80			15		
	@ Laulima Street	18			65			65			18			18			65			65			65			15			15			65			65			15		
	@ Roberts Hawaii Driveway	18			65			65			18			18			65			65			65			15			15			65			65			15		
	@ Kapule Highway	18			65			65			18			18			65			65			65			15			15			65			65			15		
Future Year Project Trips (Landfill)	@ 'Ehiku Street	10			10			9			8			10			9			8			8			8			7			8			10			7		
	@ Ma'alo Road	10			10			9			8			10			9			8			8			8			7			8			10			7		
	@ Laulima Street	8			9			9			8			8			9			8			8			7			7			8			10			7		
	@ Roberts Hawaii Driveway	8			9			9			8			8			9			8			8			7			7			8			10			7		
	@ Kapule Highway	8			9			9			8			8			9			8			8			7			7			8			10			7		
Future Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	82			24			67			20			24			67			20			20			81			17			67			81			17		
	@ Ma'alo Road	82			24			67			20			24			67			20			20			81			17			67			81			17		
	@ Laulima Street	20			67			67			20			20			67			67			67			17			17			67			67			17		
	@ Roberts Hawaii Driveway	20			67			67			20			20			67			67			67			17			17			67			67			17		
	@ Kapule Highway	20			67			67			20			20			67			67			67			17			17			67			67			17		
Opening Year (2020) + Landfill	@ 'Ehiku Street	62	584	0	0	1058	18	10	0	93	0	0	0	109	996	0	0	942	14	18	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Ma'alo Road	26	391	0	0	893	21	15	0	18	0	0	0	38	894	0	0	654	31	37	0	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Laulima Street	4	352	40	14	851	13	3	0	3	60	0	46	4	839	88	16	642	4	8	1	6	36	2	29	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Roberts Hawaii Driveway	0	0	0	9	0	1	1	477	0	128	876	13	0	0	0	8	0	12	2	646	0	0	0	695	10	0	0	0	0	0	0	0	0	0	0	0	0		
	@ Kapule Highway	35	333	0	0	948	981	305	0	309	0	0	0	108	1098	0	0	494	596	586	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Opening Year (2020) + Landfill + RRP	@ 'Ehiku Street	62	655	0	0	1072	18	10	0	93	0	0	0	109	1008	0	0	1014	14	18	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Ma'alo Road	98	391	0	0	893	79	27	0	32	0	0	0	50	894	0	0	654	41	95	0	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Laulima Street	4	364	40	14	909	13	3	0	3	60	0	46	4	897	88	16	652	4	8	1	6	36	2	29	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Roberts Hawaii Driveway	0	0	0	9	0	1	1	489	0	128	935	13	0	0	0	8	0	12	2	704	0	0	0	705	10	0	0	0	0	0	0	0	0	0	0	0	0		
	@ Kapule Highway	35	333	0	0	948	1040	317	0	309	0	0	0	108	1098	0	0	494	606	644	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Future Year (2040) + Landfill	@ 'Ehiku Street	76	713	0	0	1291	22	12	0	114	0	0	0	133	1216	0	0	1149	17	22	0	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Ma'alo Road	33	477	0	0	1090	26	19	0	22	0	0	0	46	1091	0	0	798	38	45	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Laulima Street	5	429	48	17	1038	16	4	0	4	73	0	56	5	1023	107	20	784	5	9	1	8	44	3	35	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Roberts Hawaii Driveway	0	0	0	10	0	1	1	582	0	156	1070	16	0	0	0	9	0	14	3	788	0	0	0	848	12	0	0	0	0	0	0	0	0	0	0	0	0		
	@ Kapule Highway	43	407	0	0	1156	1198	372	0	377	0	0	0	132	1340	0	0	603	728	715	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Future Year (2040) + Landfill + RRP	@ 'Ehiku Street	76	784	0	0	1305	22	12	0	114	0	0	0	133	1228	0	0	1221	17	22	0	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Ma'alo Road	104	477	0	0	1090	84	30	0	36	0	0	0	58	1091	0	0	798	48	103	0	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Laulima Street	5	441	48	17	1097	16	4	0	4	73	0	56	5	1082	107	20	794	5	9	1	8	44	3	35	0	0	0	0	0	0	0	0	0	0	0	0			
	@ Roberts Hawaii Driveway	0	0	0	10	0	1	1	594	0	156	1128	16	0	0	0	9	0	14	3	846	0	0	0	858	12	0	0	0	0	0	0	0	0	0	0	0	0		
	@ Kapule Highway	43	407	0	0	1156	1256	383	0	377	0	0	0	132	1340	0	0	603	737	773	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
@ Kauai Beach Drive	0	832	39	26	2470	0	0	0	0	67	0	17	0	2190	52	51	1197	0	0	0	0	115	0	81	0	0	0	0	0	0	0	0	0	0	0	0				

Laulima Street Access Alternative																									
Opening Year Project Trips (Landfill)	@ 'Ehiku Street	8			8						7			8											
	@ Ma'alo Road	8			8						7			8											
	@ Laulima Street	8					7			7				8											
	@ Roberts Hawaii Driveway									7								5							
Opening Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	80			23						19			80											
	@ Ma'alo Road	80			23						19			80											
	@ Laulima Street	80					65			18			23				15	65	80						
	@ Roberts Hawaii Driveway											18					15	65	15						
Future Year Project Trips (Landfill)	@ 'Ehiku Street	10			10						8			10											
	@ Ma'alo Road	10			10						8			10											
	@ Laulima Street	10					9			8			10				7	8	10						
	@ Roberts Hawaii Driveway											8					7	8	7						
Future Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	82			24						20			81											
	@ Ma'alo Road	82			24						20			81											
	@ Laulima Street	82					67			20			24				17	67	81						
	@ Roberts Hawaii Driveway											20					17	67	17						
Opening Year (2020) + Landfill	@ 'Ehiku Street	62	584	0	0	1058	18	10	0	93	0	0	0	109	996	0	0	942	14	18	0	63	0	0	0
	@ Ma'alo Road	18	400	0	0	901	14	9	0	10	0	0	0	31	901	0	0	662	26	30	0	34	0	0	0
	@ Laulima Street	13	345	40	14	844	20	10	0	11	60	0	46	11	832	88	16	637	10	14	1	15	36	2	29
	@ Roberts Hawaii Driveway	0	0	0	9	0	1	1	477	0	128	876	13	0	0	0	8	0	12	2	646	0	0	695	10
	@ Kapule Highway	35	333	0	0	948	981	305	0	309	0	0	0	108	1098	0	0	494	596	586	0	68	0	0	0
Opening Year (2020) + Landfill + RRP	@ 'Ehiku Street	62	655	0	0	1072	18	10	0	93	0	0	0	109	1008	0	0	1014	14	18	0	63	0	0	0
	@ Ma'alo Road	18	471	0	0	916	14	9	0	10	0	0	0	31	913	0	0	734	26	30	0	34	0	0	0
	@ Laulima Street	84	345	40	14	844	78	22	0	26	60	0	46	23	832	88	16	637	20	73	1	86	36	2	29
	@ Roberts Hawaii Driveway	0	0	0	9	0	1	1	489	0	128	935	13	0	0	0	8	0	12	2	704	0	0	705	10
	@ Kapule Highway	35	333	0	0	948	1040	317	0	309	0	0	0	108	1098	0	0	494	606	644	0	68	0	0	0
Future Year (2040) + Landfill	@ 'Ehiku Street	76	713	0	0	1291	22	12	0	114	0	0	0	133	1216	0	0	1149	17	22	0	77	0	0	0
	@ Ma'alo Road	22	488	0	0	1100	17	10	0	12	0	0	0	38	1099	0	0	808	31	37	0	42	0	0	0
	@ Laulima Street	16	421	48	17	1030	24	12	0	14	73	0	56	13	1015	107	20	777	12	17	1	18	44	3	35
	@ Roberts Hawaii Driveway	0	0	0	10	0	1	1	582	0	156	1070	16	0	0	0	9	0	14	3	788	0	0	848	12
	@ Kapule Highway	43	407	0	0	1156	1198	372	0	377	0	0	0	132	1340	0	0	603	728	715	0	82	0	0	0
Future Year (2040) + Landfill + RRP	@ 'Ehiku Street	76	784	0	0	1305	22	12	0	114	0	0	0	133	1228	0	0	1221	17	22	0	77	0	0	0
	@ Ma'alo Road	22	559	0	0	1114	17	10	0	12	0	0	0	38	1111	0	0	879	31	37	0	42	0	0	0
	@ Laulima Street	87	421	48	17	1030	83	24	0	28	73	0	56	26	1015	107	20	777	22	76	1	89	44	3	35
	@ Roberts Hawaii Driveway	0	0	0	10	0	1	1	594	0	156	1128	16	0	0	0	9	0	14	3	846	0	0	858	12
	@ Kapule Highway	43	407	0	0	1156	1256	383	0	377	0	0	0	132	1340	0	0	603	737	773	0	82	0	0	0
@ Kauai Beach Drive	0	832	39	26	2470	0	0	0	0	67	0	17	0	2190	52	51	1197	0	0	0	0	115	0	81	

Roberts Hawaii Driveway Access Alternative																									
Opening Year Project Trips (Landfill)	@ 'Ehiku Street	8			8							7			8										
	@ Ma'alo Road	8			8							7			8										
	@ Laulima Street	8			8							7			8										
	@ Roberts Hawaii Driveway					7		8	8			7			7		8	7	5						
	@ Kapule Highway							7	7							5		7							
	@ Kauai Beach Drive	7			7							7													
Opening Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	80			23							19			80										
	@ Ma'alo Road	80			23							19			80										
	@ Laulima Street	80			23							19			80										
	@ Roberts Hawaii Driveway					18		23	80			65			65		80	19	15						
	@ Kapule Highway							65	18							15	65								
	@ Kauai Beach Drive	18			65							65													
Future Year Project Trips (Landfill)	@ 'Ehiku Street	10			10							8			10										
	@ Ma'alo Road	10			10							8			10										
	@ Laulima Street	10			10							8			10										
	@ Roberts Hawaii Driveway					8		10	10						8		8		7						
	@ Kapule Highway							9	8						7		8								
	@ Kauai Beach Drive	8			9							8													
Future Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	82			24							20			81										
	@ Ma'alo Road	82			24							20			81										
	@ Laulima Street	82			24							20			81										
	@ Roberts Hawaii Driveway					20		24	82			67			67		81	20	17						
	@ Kapule Highway							67	20							17	67								
	@ Kauai Beach Drive	20			67							67													
Opening Year (2020) + Landfill	@ 'Ehiku Street	62	584	0	0	1058	18	10	0	93	0	0	0	109	996	0	0	942	14	18	0	63	0	0	0
	@ Ma'alo Road	18	400	0	0	901	14	9	0	10	0	0	0	31	901	0	0	662	26	30	0	34	0	0	0
	@ Laulima Street	4	353	40	14	852	13	3	0	3	60	0	46	4	839	88	16	645	4	8	1	6	36	2	29
	@ Roberts Hawaii Driveway	0	0	0	15	0	9	9	471	0	128	870	20	0	0	0	14	0	20	9	639	0	0	689	15
	@ Kapule Highway	35	333	0	0	948	981	305	0	309	0	0	0	108	1098	0	0	494	596	586	0	68	0	0	0
	@ Kauai Beach Drive	0	673	32	21	1976	0	0	0	0	55	0	14	0	1747	43	42	972	0	0	0	0	94	0	66
Opening Year (2020) + Landfill + RRP	@ 'Ehiku Street	62	655	0	0	1072	18	10	0	93	0	0	0	109	1008	0	0	1014	14	18	0	63	0	0	0
	@ Ma'alo Road	18	471	0	0	916	14	9	0	10	0	0	0	31	913	0	0	734	26	30	0	34	0	0	0
	@ Laulima Street	4	425	40	14	866	13	3	0	3	60	0	46	4	851	88	16	717	4	8	1	6	36	2	29
	@ Roberts Hawaii Driveway	0	0	0	27	0	24	81	471	0	128	870	78	0	0	0	73	0	92	21	639	0	0	689	25
	@ Kapule Highway	35	333	0	0	948	1040	317	0	309	0	0	0	108	1098	0	0	494	606	644	0	68	0	0	0
	@ Kauai Beach Drive	0	684	32	21	2035	0	0	0	0	55	0	14	0	1805	43	42	982	0	0	0	0	94	0	66
Future Year (2040) + Landfill	@ 'Ehiku Street	76	713	0	0	1291	22	12	0	114	0	0	0	133	1216	0	0	1149	17	22	0	77	0	0	0
	@ Ma'alo Road	22	488	0	0	1100	17	10	0	12	0	0	0	38	1099	0	0	808	31	37	0	42	0	0	0
	@ Laulima Street	5	432	48	17	1039	16	4	0	4	73	0	56	5	1023	107	20	787	5	9	1	8	44	3	35
	@ Roberts Hawaii Driveway	0	0	0	19	0	11	12	574	0	156	1061	24	0	0	0	17	0	24	11	780	0	0	841	19
	@ Kapule Highway	43	407	0	0	1156	1198	372	0	377	0	0	0	132	1340	0	0	603	728	715	0	82	0	0	0
	@ Kauai Beach Drive	0	820	39	26	2412	0	0	0	0	67	0	17	0	2131	52	51	1187	0	0	0	0	115	0	81
Future Year (2040) + Landfill + RRP	@ 'Ehiku Street	76	784	0	0	1305	22	12	0	114	0	0	0	133	1228	0	0	1221	17	22	0	77	0	0	0
	@ Ma'alo Road	22	559	0	0	1114	17	10	0	12	0	0	0	38	1111	0	0	879	31	37	0	42	0	0	0
	@ Laulima Street	5	503	48	17	1054	16	4	0	4	73	0	56	5	1036	107	20	858	5	9	1	8	44	3	35
	@ Roberts Hawaii Driveway	0	0	0	30	0	26	83	574	0	156	1061	83	0	0	0	76	0	96	23	780	0	0	841	28
	@ Kapule Highway	43	407	0	0	1156	1256	383	0	377	0	0	0	132	1340	0	0	603	737	773	0	82	0	0	0
	@ Kauai Beach Drive	0	832	39	26	2470	0	0	0	0	67	0	17	0	2190	52	51	1197	0	0	0	0	115	0	81

Kauai Beach Drive Access Alternative																									
Opening Year Project Trips (Landfill)	@ 'Ehiku Street	8			8						7			8											
	@ Ma'alo Road	8			8						7			8											
	@ Laulima Street	8			8						7			8											
	@ Roberts Hawaii Driveway							8			8						7								
	@ Kapule Highway							8			8						7								
@ Kauai Beach Drive	8					7	7	8					7	5		7	8								
Opening Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	80			23						19			80											
	@ Ma'alo Road	80			23						19			80											
	@ Laulima Street	80			23						19			80											
	@ Roberts Hawaii Driveway							80			23						19								
	@ Kapule Highway				23			80			23						80	19	80						
@ Kauai Beach Drive	80			65		18	23					19	15		65	80									
Future Year Project Trips (Landfill)	@ 'Ehiku Street	10			10						8			10											
	@ Ma'alo Road	10			10						8			10											
	@ Laulima Street	10			10						8			10											
	@ Roberts Hawaii Driveway							10			10						8								
	@ Kapule Highway				10			10	10		10						8	10							
@ Kauai Beach Drive	10			9		8	10					8	7		8	10									
Future Year Project Trips (Landfill + RRP)	@ 'Ehiku Street	82			24						20			81											
	@ Ma'alo Road	82			24						20			81											
	@ Laulima Street	82			24						20			81											
	@ Roberts Hawaii Driveway							82			24						20								
	@ Kapule Highway				24			82	24		24						81	20	81						
@ Kauai Beach Drive	82			67		20	24					20	17		67	81									
Opening Year (2020) + Landfill	@ 'Ehiku Street	62	584	0	0	1058	18	10	0	93	0	0	0	109	996	0	0	942	14	18	0	63	0	0	0
	@ Ma'alo Road	18	400	0	0	901	14	9	0	10	0	0	0	31	901	0	0	662	26	30	0	34	0	0	0
	@ Laulima Street	4	353	40	14	852	13	3	0	3	60	0	46	4	839	88	16	645	4	8	1	6	36	2	29
	@ Roberts Hawaii Driveway	0	0	0	9	0	1	1	479	0	128	878	13	0	0	0	8	0	12	2	646	0	0	698	10
	@ Kapule Highway	35	333	0	0	948	983	306	0	309	0	0	0	108	1098	0	0	494	599	586	0	68	0	0	0
@ Kauai Beach Drive	8	666	32	21	1970	7	7	0	8	55	0	14	7	1740	43	42	967	5	7	0	8	94	0	66	
Opening Year (2020) + Landfill + RRP	@ 'Ehiku Street	62	655	0	0	1072	18	10	0	93	0	0	0	109	1008	0	0	1014	14	18	0	63	0	0	0
	@ Ma'alo Road	18	471	0	0	916	14	9	0	10	0	0	0	31	913	0	0	734	26	30	0	34	0	0	0
	@ Laulima Street	4	425	40	14	866	13	3	0	3	60	0	46	4	851	88	16	717	4	8	1	6	36	2	29
	@ Roberts Hawaii Driveway	0	0	0	9	0	1	1	550	0	128	892	13	0	0	0	8	0	12	2	658	0	0	769	10
	@ Kapule Highway	35	333	0	0	948	997	378	0	309	0	0	0	108	1098	0	0	494	670	598	0	68	0	0	0
@ Kauai Beach Drive	80	666	32	21	1970	65	18	0	23	55	0	14	19	1740	43	42	967	15	65	0	80	94	0	66	
Future Year (2040) + Landfill	@ 'Ehiku Street	76	713	0	0	1291	22	12	0	114	0	0	0	133	1216	0	0	1149	17	22	0	77	0	0	0
	@ Ma'alo Road	22	488	0	0	1100	17	10	0	12	0	0	0	38	1099	0	0	808	31	37	0	42	0	0	0
	@ Laulima Street	5	432	48	17	1039	16	4	0	4	73	0	56	5	1023	107	20	787	5	9	1	8	44	3	35
	@ Roberts Hawaii Driveway	0	0	0	10	0	1	1	585	0	156	1071	16	0	0	0	9	0	14	3	788	0	0	851	12
	@ Kapule Highway	43	407	0	0	1156	1199	374	0	377	0	0	0	132	1340	0	0	603	731	715	0	82	0	0	0
@ Kauai Beach Drive	10	812	39	26	2403	9	8	0	10	67	0	17	8	2123	52	51	1180	7	8	0	10	115	0	81	
Future Year (2040) + Landfill + RRP	@ 'Ehiku Street	76	784	0	0	1305	22	12	0	114	0	0	0	133	1228	0	0	1221	17	22	0	77	0	0	0
	@ Ma'alo Road	22	559	0	0	1114	17	10	0	12	0	0	0	38	1111	0	0	879	31	37	0	42	0	0	0
	@ Laulima Street	5	503	48	17	1054	16	4	0	4	73	0	56	5	1036	107	20	858	5	9	1	8	44	3	35
	@ Roberts Hawaii Driveway	0	0	0	10	0	1	1	656	0	156	1085	16	0	0	0	9	0	14	3	800	0	0	923	12
	@ Kapule Highway	43	407	0	0	1156	1213	446	0	377	0	0	0	132	1340	0	0	603	802	727	0	82	0	0	0
@ Kauai Beach Drive	82	812	39	26	2403	67	20	0	24	67	0	17	20	2123	52	51	1180	17	67	0	81	115	0	81	

Appendix B
Intersection Level of Service Calculations
and MUTCD Traffic Signal Warrants
(available under separate cover)

Appendix C
Social Impacts Assessment Supporting Information

Appendix C.1
Summary of TREFS Public Meeting
King Kaumuali'i School Cafeteria, Hanamā'ulu
January 16, 2014

Subject: Summary of TREFS Public Meeting

Presenters: Consultants: Frank Cioffi, Wayne Yoshioka, Brian Takeda, Jim Dannemiller
County of Kaua'i: Mayor Bernard Carvalho, Larry Dill, Donald Fujimoto,
Troy Tanigawa, Nadine Nakamura, Beth Tokioka

Attendees: At start: 39.¹ Total signed in by meeting's end: 54.

Following is a summary of the TREFS Community Meeting held January 16, 2014, at the King Kaumuali'i Elementary in Hanamā'ulu, Kaua'i, to discuss potential new landfill and resource recovery park access route alternatives. Comments and responses are not directly quoted. Comments relevant to the access route choice are summarized at the end of this document.

MEETING SUMMARY

Opening Remarks: Donald Fujimoto opened the meeting at 6:10 pm and introduced Mayor Carvalho. The Mayor thanked everyone for attending and asked that even if parties might disagree on the issues that everyone make every effort to listen to and respect each other's opinions.

Frank Cioffi next presented the project's Traffic and Roadways Engineering Feasibility Study (TREFS). Wayne Yoshioka provided additional information on study details involving traffic and infrastructure. Jim Dannemiller discussed the results of interviews from area residents on social issues associated with each of the access road alternatives.

Frank Cioffi provided a follow-up summary on the purpose and reason for the TREFS Study and this public meeting and accepted public comments starting at approximately 6:35 pm.

Respondent (R): A Clarification: On Wayne's numbers especially the Traffic Assessment, referencing the Level of Services table: what do those numbers measure? Answer (A): (Wayne) The numbers are "delay in seconds", the average delay at a specific intersection, for the worst approach route. Laulima's 161 seconds might be considered very high.

The resident continued: Did you look at roundabouts or left turn only options, any options other than signalization? A: AECOM did look at roundabouts. Roundabouts require a lot of right of way and in Laulima you don't have room for it. Having no left turns means trucks can only turn in from the right turn. Frank reinforced need for real estate.

R: Do you guys still have the bypass road as an alternative access road? We used to talk about that (in previous discussions of landfill at Ma'alo). You'd take most of these problems away if you just used the bypass road. Respondent noted that the four routes discussed here are similar to some bypass road routes that have been seen or discussed in the last several months. A: (Larry Dill) The bypass road was part of this (discussion of a landfill at Ma'alo) in the past. But from a traffic engineering point of view, it is not necessary to include the bypass road in the landfill project, due to the availability of alternative access routes. The bypass road is still on the table and being considered, but not as part of the landfill project.

¹ Attendance was largely local residents. Seven participants identified themselves as members or as representing an organization or association and three signed in as representatives of government agencies. The other 30 were residents of Hanamā'ulu, including several members of the Hanamā'ulu Community Association. At one point, a participant stated that she had alerted every household living along Laukona Street and asked them to attend. During the meeting, several persons identified themselves as residents of Laukona Street.

R: So is this a temporary solution we are working on? A: (Larry Dill) The connections in Hanamā'ulu and Lihue, would be needed now to access the site.

R: Seems like the bypass road is a win-win-win for all of this. So right now, this is temporary, right? A: (Larry Dill) What's being done here works neatly with the bypass road project.

R: The draft impact (EIS) has not been released. Kekaha is dry, Ma'alo is wet, and you are spending all this money. R continued with a formal statement against locating a landfill (see attached), and then left the premises.

R: I'd like to pick up again on the bypass road. It should be an alternative to all of these options. For several reasons it is better than any of these options. I wonder if the Isenberg people have been notified of this major change in the project. Have they been contacted? The bypass road was the original proposal (as the access route) when this landfill site was first presented to this community, and it must be included in the package. Otherwise, you are opening up for delays for not looking at all the alternatives. We are under a lot of stress to meet the deadline and if you don't look at all the alternatives, you will get sued. And this is not a separate part of the landfill. The bypass road was part of that presentation and this (the routes presented tonight) is a change. It has to be considered. A: (Frank Cioffi) We agree that the choice of access route is part of the overall landfill project, and it will be addressed in the EIS. R: The bypass road takes the trucks out before they get to Hanamā'ulu Road at all, the bypass road is the solution to this problem.

R: (Laukona Street resident) Regarding the bypass road, routes C and D affect Kalepa Village. Laukona Street affects 50-60 homes and nobody has been informed about the landfill. The people in Isenberg will all be affected. I live on Laukona Street. My property is going to be worthless. My property is going to be on the road to the dump. They haven't contacted one person on those two roads.

A: The County has notified the Kaua'i residents through several media.

R: How many trucks will there be. A: (Frank) Those numbers in the report, which is available for anyone to download from the County website.

R: I walk down Laukona Street to the bus and additional traffic on Laukona would not be safe. Are they going to let the bus come up to my house to pick me up? A: Laukona Street is not a potential access route; two of the potential access routes pass *behind* some of the properties on Laukona.

R: The question about numbers (traffic counts) seems important and needs to be available. A: (Wayne) Agreed. The material is available on the County website now.

R: Three of the four routes (B, C, and D) all go past residential areas. Takes me back to the haul cane days. Trucks went by all the time. Trade winds blew the dust. We are downwind of the landfill site now. I was born and raised in Kapaia Valley. I live in Laukona, right across the mountain. When you talk about haul cane trucks, there used to be 50 trucks a day. Dust pollution was really bad. We already had that problem with haul cane trucks. Ma'alo road is the only way to go to get there. The prevailing trade winds are going to bring everything down through the Kapaia Valley.

R: The EIS is not done and the total project isn't, either. Shouldn't you do the EIS before you get public comment? A: (Frank) We are trying to get public input before we complete the Draft EIS, because the County wants to consider public concerns now, during early planning. There will be another comment period after the Draft EIS is published.

R: To clarify, these meetings are preliminary, before the draft EIS, right? A: (Frank) Yes.

R: When you measured truck traffic for various routes; on route B, would that include traffic already on there for the power plant fuel trucks? R: (Frank) Yes.

R: (JoAnn Yukimura): This (a location on the map) is an "alternate RRP site". Alternate to what? A: (Frank) The other alternative is to have the RRP on the proposed landfill site. The EIS will evaluate both alternative locations for the RRP. R: So, how much traffic will be generated by that? Do you have numbers? A: (Frank) Those numbers are in the report. R: So you have estimated separate costs for landfill and RRP? A: (Frank) Yes. R: Will you have traffic figures for the bypass road, too? A: (Wayne) Briefly explains what numbers appear in the report. R: Are we projecting traffic for By-Pass all the way to Puhī? R: (Wayne) What we have in the report is consistent with bypass road traffic, but this analysis did not look at the bypass road. A: (Larry Dill) The By-Pass road project would include its own analysis and a separate set of community meetings to study the impacts of that issue.

R: If you get us to OK the bypass road now, we won't get to decide on it later. You're using this to get the bypass road through.

R: I have lived in Hanamā'ulu all my life. I understand about wind. I always catch the breeze from Kalepa Ridge. Will the wind be affected? I already catch dust coming down from the mountain. If you put trucks up there, what happens? Just want to make sure it's a good site for trash near Laukōna. Most of the people on Laukōna are elderly and have no access to computers. How they supposed to know this is going on?

R: Why don't we get the bypass done first and then do this? If we are going to do this, we might as well do it well. My Dad drove cane trucks his whole life. Let me run the trucks behind your back yard and see how you would like it.

R: Problem is why put a landfill near Līhū'e? It's going to make the whole town smell. I live on Laukōna. It's 100 yards from my house to the road. Used to get all the dust from the haul cane trucks and the noise. I remember.

R: One other thing about the current landfill. The site is 1.5 miles away and the people say they can hear the trucks when they go by. Can get the smell from the trucks.

R: Why is this on our side? When the stuff starts breaking down, and the stuff gets in the water, and then our kids get sick, who's going to guarantee nothing will happen? A: (Frank) There are safeguards in place for all landfill operations. In Hawai'i, the Department of Health oversees landfill operations and monitors operations over and past the life of the landfill. R: I live on Laukōna and my kids play on the cane haul roads. That's their playground. I don't think it should be there.

R: Three of the four routes are near residential areas. We should use the other one. Do we have a plan for mitigation? A: (Frank) The purpose of this meeting is to identify concerns. We can then look at options to mitigate noise, dust, and other concerns.

R: So what about the smell? You can smell the landfill from far away.

R: Again. I worked at the landfill for five years. Does anybody besides me remember the wet years? What it's like when the wet years come? Kekaha is in the driest and flattest site on the island. The biggest problem for landfill is floods. If a flood comes there is nothing we can do. It washes everything down with it. When I worked there, there was one storm in December and the guys who were working the landfill were supposed to build spillways but they didn't and it flooded the landfill, the scale house, the road. This is in Kekaha in the driest part of the island. The siting of any landfill in a wet area is very dangerous.

R: You used existing roads. Did you look at any other routes? For instance, you could come up Ma'alo Road to where it intersects 'Ehiku and then turn right along an old cane road to driveway three. Have you looked at that route? It would eliminate some of Ma'alo and not go near anyone's residential property.

R: Where is the funding coming from? A: (Larry Dill) Many funding vehicles are being considered. We have not made that choice yet. We will come to Council when we have more information.

R: Well folks, I was born and raised here, worked for Līhu'e plantation 24 years. My Dad, my grandfathers worked hard on that plantation. I was an irrigation overseer for 24 years. Started 1950. I know about rainfall. Yes, storms came through and right where the trash area² is now there's a reservoir. In 1950 we got tremendous storms. Reservoirs couldn't take the water. The dam broke and water went down to Hanamā'ulu Beach and luckily nobody got killed. Looking at the site, I changed my mind. I don't want um there. Change the site. A: (Frank) I wasn't going to address the previous comment about the potential for floods, as it doesn't relate to the roadway alternatives, but we are looking at the potential for surface water impacts and other issues in the overall EIS. The site is not located in a flood zone. In fact, on closer look at the site (referring to figure), you can see that the existing topography actually diverts flow from most of the watershed away from the site, down to the Okinawa reservoir and away from the site. Additionally, a surface water control system would be developed for the site, including diverting any offsite flows from run-on, and managing site runoff.

R: So you will get the EIS. And it will get you a probability of a major flood happening. What are you going to compare it too? A: (Brian Takeda) We are looking at many different types of landfill operations and methods other than landfill.

R: Why aren't we looking at access roads to the other sites? A: (Frank) The County is responding to comments that people were concerned about the access road to Ma'alo. R: But how can we decide among the alternatives if we don't see any access roads to the other sites? Why are we not looking at roads getting to the other sites? A: Access roads for the other potential sites were analyzed in the 2012 Siting Study report, which you can download from the County website.

R: (Joann Yukimura) Isn't it true that the site selection study has been completed and you chose Ma'alo, and are now asking about access roads to Ma'alo, the site that was chosen? People want you to make that clear. A: (Wayne) Yes, that's true. Ma'alo is the proposed site.

R: Isn't it true also that you could look at a zero waste solid waste plan? Are you looking at alternative methods? A: (Frank) Yes we are. R: Are you looking at zero waste as an alternative? A: We can look at that.

R: I find it really interesting. Why don't they put it in Princeville? (Laughter from crowd.) I want to know why that's funny. It's OK to put it in place where there are ten or twelve people on a property but not where there are lots of wealthy people. And it's also true that we are getting the rehab facility. These are working people. This is a safe neighborhood, a peaceful, quiet, safe place. And I am concerned that the county doesn't care about this community and they are going to out the landfill, the dump because that's what it is, in our community. A: (Brian Takeda) Please refer to previous siting efforts, including the Siting Study Report for an explanation why this Ma'alo is the proposed site (discusses the methods used to evaluate potential sites). The decision criteria can be seen in the report – I can assure you that nobody ever considered whether they would rather place a landfill near one type of community or another.

² R was referring to the landfill site.

R: But why not put it somewhere where it does not affect the community. My house is going to be worth nothing. Hanamā'ulu has changed. It is now a place that is affordable, if you put the dump there, all of us are living on the road to the dump. With a rehab facility on the same road. They are making it worse. You'd think the County would be in favor of lifting everybody up. I just don't get it.

R: If the project moves forward in the community, when is there a discussion about our community benefits package. A: (Mayor Carvalho) The whole community needs a landfill. Nobody wants a landfill. It's a tough decision. All you can do is play by the rules. I'm hoping that we are faithfully following the process before us and that you are included every step of the way. We have tried our very best to follow the process. There is a host community benefits package. We need to see what the benefits will be. Because you would be the hosts of the landfill in this beautiful community, those benefits would go to you. Tonight is about the access roads. There's much more to come, many decisions to be made. I really appreciate the discussion.

R: Considering the rain: If you follow Ma'alo Road all the way to the falls, the lowest part of that road is (did not understand the location referenced). If for some reason we got rain to flood that whole basin, the water would come down on the left side of Immaculate Conception Church and anything below that would be flooded, damaged.

R: About the flood. Here in Laukona, a couple months ago, the ditch by the cane haul road flooded and dumped water into people's back yards. Just regular rain now. Most of the time when it rains you have brown water always running to the highway, down the middle of Laukona Street.

R: (JoAnn Yukimura) Part of the problem with choosing the site was that you chose it before you planned the access roads, and now you find you didn't look at the access roads and now you're coming to the community to get input. A: (Donald Fujimoto) That is not true; access roads were considered, and continue to be.

R: You owe it to the community to consider all the alternatives. If this landfill was accepted based on access through Ma'alo Road, how can you come back to us now? A: (Wayne) We found out from the community that they were concerned about the access road and they wanted us to consider some options. The County is trying to be responsive to public concerns.

R: Ma'alo Road is the only road that could work.

R: Clarification about access. I went on the county tour of the site. We did go down the Ma'alo Road. Is your route A that route? A: (Frank) Yes, I was on the bus that day we went to the proposed site. R: If 'Ehiku Street was considered, does that include realignment of Aukina Street. A: (Frank) No, that's part of the long-range plan.

R: So Ma'alo site is basically the go-to site? It is the proposed site. If that falls through, you start all over again, right? A: (Frank) Yes, Ma'alo is the proposed site.

R: I am concerned about the site. But I agree that if it becomes a site, Laulima Street would be the best route. We're trying to see how we can fund it, too. I think cost is more important than some of the other issues. And the traffic light would be good. Right now all our traffic lights are affected by storms or even heavy rain. Having a signal light there would be good.

R: I know the flooding issue is important, but the shorter routes that are closer to residential areas are easier to swallow. It's becoming our back yards. You don't necessarily smell the dump you smell the trucks. I wish the bypass road were being considered.

R: Comment. We want everybody to know and to be kept abreast. I sign in, give my contact information, and we never get told when the next meeting is. Where do these names and information

go? And we never hear from anyone again. The County has done a very poor job over the years. It's so easy by computer. One button and hundreds of people have been notified. This list should all be notified of workshops, etc. People who attended the Isenberg tracts meeting about the drug rehab study could have been notified about this meeting. A: We can make sure to follow up with those who signed in and left a means of contact.

There being no more questions or comments related to the access routes, Donald Fujimoto called the meeting to a close at 8:35 pm.

Mayor Carvalho thanked the participants for attending and promised that further information on the project will be forthcoming.

SUMMARY OF COMMENTS REGARDING ACCESS ROUTE ALTERNATIVES

Many of the comments did not pertain to the access route alternatives. All of the consolidated comments below referenced the access roads and/or driveways. Some of these comments were echoed by more than one respondent, and worded slightly differently.

1. Several attendees stated that Route A was the best route, primarily because it does not pass near residential areas.
2. Several attendees were concerned with negative impact of truck traffic affecting residents along 'Ehiku Street if Route B were implemented.
3. Several attendees indicated that Routes C and D would have a negative impact on property values along Laukona Street.
4. Several attendees indicated that Routes C and D would have a negative impact on dust, odor, and noise along Laukona Street.
5. It was stated that Laukona Street already floods (receives large amounts of brown water runoff) due to breakdown or blockage of the ditch next to the cane haul road suggested as part of Routes C & D. Accordingly, Several attendees indicated that Routes C and D would have a negative impact on excessive runoff or floods along Laukona Street.
6. One person stated that Route C would have a negative impact on residents of Kalepa Village.
7. Several attendees indicated that Route C would cost the County the least, is the most direct, and is therefore the best alternative. Also, it was noted that improvements at the Lailima-Kūhiō interchange (the traffic light) would be a benefit.
8. One person stated that Routes C and D would have a negative impact on residents of Kalepa Village.

List of Signed-in Meeting Attendees

Access Road Alternatives for the Proposed New Kaua'i Landfill & Resource Recovery Park
Traffic & Roadways Engineering Feasibility Study (TREFS)

Community Meeting
King Kaumuali'i Elementary School, Hanamā'ulu, Kaua'i
Thursday, January 16, 2014, 6:00 pm to 8:00 pm

	Name	Organization (if any)	Contact info
1	Jerry Ornellas	KCFB	jerryo@hawaii.edu
2	Michael Wong		
3	Joe Bunao	Self	joebunao@msn.com
4	Ken Taylor	Self	taylor021@hawaii.rr.com
5	K. Horide		
6	Glen Mukein	Self	glenruth2030@gmail.com
7	Basilia Asuncion	Self	
8	Consolacion Manera	Self	
9	Yudare T.Y. Hirano	Self	
10	Bernard Bernardo	Self	trdbb@hotmail.com
11	Wendy Raebeck	Self	wendywailua@gmail.com
12	Deane & Joaquina Alahem	Self	651-0212
13	Keola Aki	Self/SW	kreaki@gmail.com
14	Tito Villaneueva	Self	tito.villanueva@amr.net
15	Florentino Duterte	H.A.	
16	Dennis Sareta	UPW Release	
17	Roy K. Sasaki	Kaua'i Island Ministries	kahurocky@yahoo.com
18	Chad Corpuz		808-482-1970
19	Keith Suga	County of Kaua'i	
20	D. Kaliko Santos	OHA Kaua'i	kalikos@oha.org
21	Pat Gegen	Zero Waste Kaua'i	psgegen@hotmail.com
22	Laurie Kelekoma	Hanamā'ulu Community Assn.	lauriekelekoma@hotmail.com
23	Juanito Gonzalez	Hanamā'ulu	808-245-2473
24	Ricky Banquel	None	Hanamā'ulu
25	William Buddingh		buddingh@hawaiiantel.net
26	Theresa Koki	County	tkokie@Kaua'i.gov

	Name	Organization (if any)	Contact info
27	William Neil Rapozo	Hanamā'ulu Community Assn.	nrapozo@hawaiiantel.net
28	Mildred Rapozo	Hanamā'ulu	
29	Dario Sirioroko	State	
30	Jonathan Corbillon	None	None
31	Jyden Wong	None	None
32	Javen Wong	None	None
33	Shanice Sanay	None	None
34	Jetta Wong	None	None
35	Larry Dill	County of Kaua'i	
36	Michael V. Layota	None	808-651-8168
37	Shawn de Mille		surfpakalas@hotmail.com
38	Regina Carvalho	Community Member	
39	Eddie Sarita	Hanamā'ulu Community Assn.	esarita2011@live.com
40	Nadine Nakamura	County of Kaua'i	
41	Pauline Kulsch	None	808-652-9807
42	Gene Costa	None	808-554-5979
43	Ted Juarng		808-245-3027
44	Rayne Regush	Sierra Club	808-651-1318
45	Bryson Vivas	County of Kaua'i	
46	Clara Nuiwa		808-245-3947
47	Geraldine Duarte	None	808-246-6065
48	Cheryl Soon	SSFM	808-356-1268
49	JoAnn Yukimura	Council	808-652-3988
50	Bonnie Bator	'Ohana	808-822-5547
51	Kami Kearnsam	'Ohana	808-639-8628
52	Peter Kepo	Hanamā'ulu Sr. Softball	808-482-1461
53	Hank Ibia	Hanamā'ulu	808-652-5221
54	Wanda Shibata	Gov Office	808-374-3100

**Appendix C.2
Access Routes
Fact Sheet and Public Comment Sheet**

Route E begins at the Kūhiō Highway intersection with Kaua'i Beach Drive. The route runs along an existing cane haul road to Roberts Hawaii Driveway, from where the route is identical to Route D.

The following improvements would be recommended for Route E:

- Modify the highway intersection and install a traffic signal synchronized with the one at the nearby Kupule Hwy / Kūhiō Hwy intersection
- Widen and pave Kaua'i Beach Drive and the existing cane haul roads
- Estimated cost for roadway improvements: **\$17.3 million** (plus \$5.4–\$6.8 million if the Alternate RRP site is implemented)



Community Meeting:

Access Road Alternatives for the Proposed New Municipal Solid Waste Landfill and Resource Recovery Park

The County of Kaua'i Department of Public Works, Solid Waste Division, will host a community meeting to present the preliminary findings of a feasibility study conducted to evaluate potential access roads for the proposed New Municipal Solid Waste Landfill and Resource Recovery Park, which are being evaluated in a State of Hawai'i Environmental Impact Statement (EIS).

The goal of the meeting is to present the preliminary traffic and engineering findings for the potential access routes, and to obtain public comments and concerns regarding the potential access route alternatives.

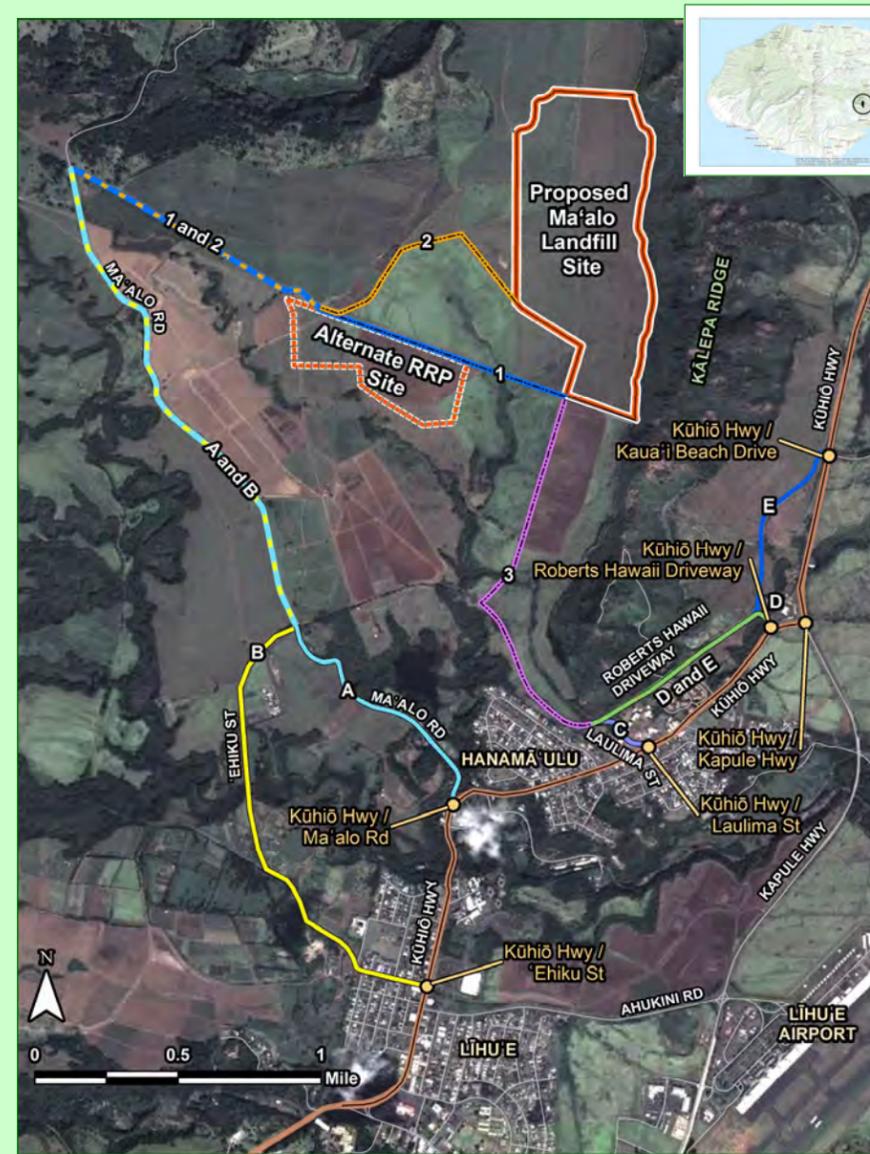
Meeting is from 6:00 pm to 8:00 pm on the following date and location:

**Thursday, September 22, 2016
King Kaumuali'i Elementary
Hanamā'ulu, Kaua'i**

The Proposed New Municipal Solid Waste Landfill and Resource Recovery Park at Ma'alo, Kaua'i

The County of Kaua'i proposes to establish a new municipal solid waste landfill at Ma'alo, a 280-acre parcel of grass and pasture land located between Līhu'e and Wailua. More than 100,000 tons of municipal solid waste are generated on Kaua'i each year, and the County's only existing landfill at Kekaha is reaching capacity and needs to be closed.

To help select the best route for landfill vehicles to use between the Proposed Landfill site and Kūhiō Highway, the County is conducting a *Traffic and Roadways Engineering Feasibility Study* (TREFS) and requesting public input and comments. The study assesses traffic impacts, required roadway improvements, and social impacts for five potential access routes (A, B, C, D, E).



To better assess the social impacts of vehicles using any one of the potential routes to access the Proposed Landfill and Resource Recovery Park, the County seeks more input from residents, businesses, and property owners.

This fact sheet presents an overview of the five potential routes so you can be better informed when completing the enclosed public comment sheet.

Thank you for your input.



Access Route A: MA'ALO ROAD

Length: 4.7–4.8 miles

Route A follows Ma'alo Road from its Kūhiō Highway junction for 1.8 miles to an intersection with an existing cane haul road; after 1 mile the route would either continue straight for another 1 mile directly to the Proposed Landfill site (Driveway 1), or detour slightly north to avoid a wetland (Driveway 2).

The following improvements would be recommended for Route A:

- Modify the highway intersection; install a traffic signal when conditions warrant
- Widen a small bridge and straighten a sharp curve on Ma'alo Road
- Widen and repave Ma'alo Road; widen and pave the cane haul roads; provide utilities
- Estimated cost for roadway improvements: **\$41.4–\$42.9 million**



Access Route B: 'EHIKU STREET

Length: 5.6–5.7 miles

Route B follows 'Ehiku Street from its Kūhiō Highway junction past the Isenberg neighborhood of Līhu'e and continues to the junction at Ma'alo Road. From there, the route to the Proposed Landfill site is the same as Route A (using either Driveway 1 or Driveway 2).

The following improvements would be recommended for Route B:

- Modify the highway intersection and signal operation; upgrade pedestrian facilities
- Modify the intersection of 'Ehiku Street and Ma'alo Road
- Reconstruct a large culvert under 'Ehiku Road
- Widen & repave 'Ehiku Street & Ma'alo Road; widen and pave cane haul roads; provide utilities
- Estimated cost for roadway improvements: **\$41.9–\$43.3 million**



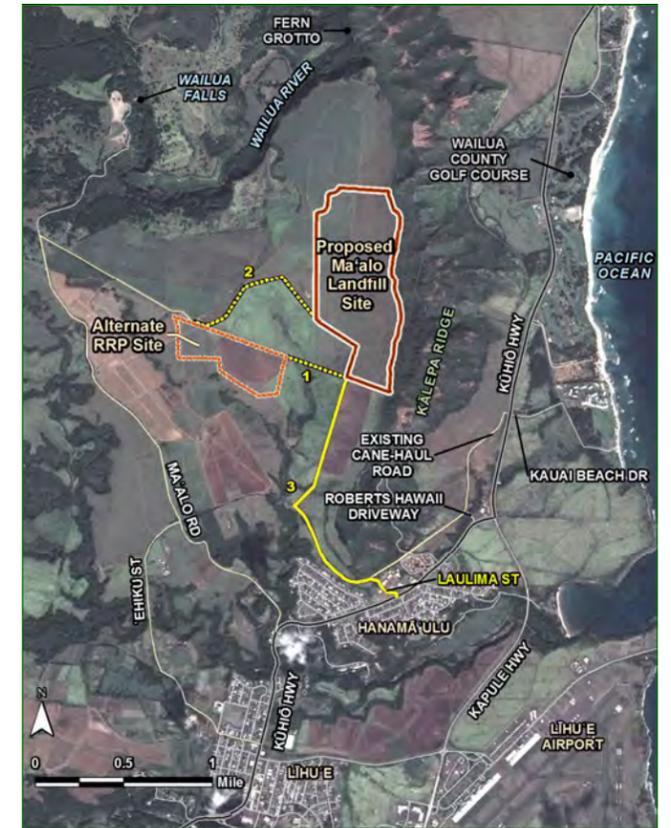
Access Route C: LAULIMA STREET

Length: 1.7 miles

Route C follows Laulima Street from its Kūhiō Highway junction to a nearby cane haul road (Driveway 3), where it runs behind Hanamā'ulu's Laukona Street before continuing north to the Proposed Landfill site. If the Alternate RRP site is implemented, a portion of Driveway 1 or 2 would also be developed.

The following improvements would be recommended for Route C:

- Modify the highway intersection and install a traffic signal (recommended in the future regardless)
- Widen and repave Laulima Street; widen and pave the cane haul roads
- Estimated cost for roadway improvements: **\$12.8 million** (plus \$5.4–\$6.8 million if Alternate RRP site is implemented)



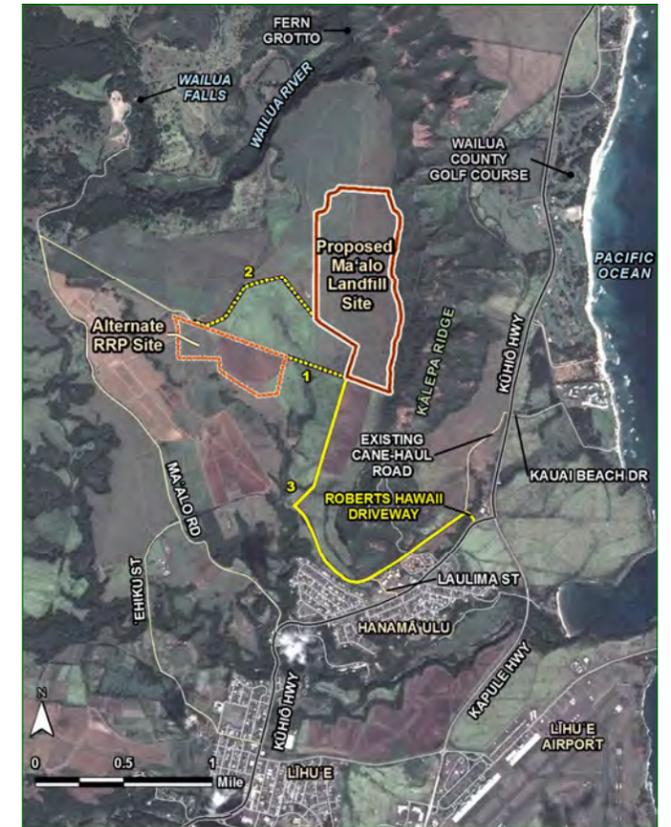
Access Route D: ROBERTS HAWAII DRIVEWAY

Length: 2.2 miles

Route D begins at the driveway at the Roberts Hawaii depot on Kūhiō Highway and follows an existing cane-haul road to Driveway 3 and the Proposed site. If the Alternate RRP site is implemented, a portion of Driveway 1 or 2 would also be developed.

The following improvements would be recommended for Route D:

- Modify the highway intersection and install a traffic signal synchronized with the one at the nearby Kupule Hwy / Kūhiō Hwy intersection
- Widen and pave Roberts Hawaii Driveway and the cane haul roads
- Estimated cost for roadway improvements: **\$14.6 million** (plus \$5.4–\$6.8 million if Alternate RRP site is implemented)



Access Route E: KAUA'I BEACH DRIVE

(E1) Advantages for Access Route E:

(E2) Disadvantages for Access Route E:

General Questions for Respondents

(QG1) Where do you currently live (circle one):

- One the island of Kaua'i [Zipcode or Community: _____]
- On the island of Ni'ihau
- On another island in Hawai'i
- Outside the State

If you would like to receive feedback on the results of this survey, please provide your contact information (postal or email address) below. All contact items are voluntary.

Name and Address:

e-mail address:

If provided, your contact information will be maintained for communication purposes only, until the Final EIS is issued. No information you supply on this form will be released to any person or agency without your prior permission. No information reported during the course of this project will be attributed to any individual or any agency without prior approval. Data will be reported in aggregate form only.

ACCESS ROUTES PUBLIC COMMENT SHEET

Proposed New Municipal Solid Waste Landfill and Resource Recovery Park at Ma'alo, Kaua'i

BACKGROUND INFORMATION

The enclosed **Fact Sheet** describes the potential Access Routes A, B, C, D, and E, and summarizes the preliminary results of the **REVISED DRAFT TRAFFIC AND ROADWAYS ENGINEERING FEASIBILITY STUDY (TREFS)**. Further details of the potential access routes are provided in the Revised Draft TREFS report, available on the County of Kaua'i's New Landfill website: www.kauai.gov/NewLandfillSite

For each route, the TREFS report provides detailed analysis of existing and projected traffic conditions and impacts; recommended improvements and associated cost estimates; and a preliminary evaluation of the potential social impacts.

PUBLIC OUTREACH

This public outreach is being conducted in response to public concerns regarding the access routes expressed during meetings held for the ongoing project Environmental Impacts Statement (EIS) process. The County is committed to soliciting and considering all reasonable public concerns regarding the potential access routes. No final decision regarding the proposed access route has been made, and the proposed access route will be further analyzed during the ongoing EIS process. Public comments will be considered, along with other engineering, environmental, and cost data to assist the County of Kaua'i in selecting the best access route to the Ma'alo Landfill Site.

INSTRUCTIONS

Please review the Fact Sheet, and preferably the Draft TREFS report, which are intended to summarize the analyses performed, prior to providing your comments this comment sheet. For each route, please list the advantages and disadvantages, if any, you think that access route has for the site, the nearby communities, or the residents and businesses of the County of Kaua'i.

If you feel that one of the advantages or disadvantages is most important, please circle it. If you feel that any particular route has no advantages or disadvantages, please leave that section empty. Attach a separate sheet, if necessary, and please remember to circle or otherwise indicate the most important advantage or disadvantage of this route, if applicable.

Comments can be submitted via e-mail to: KauaiLandfillAccessRoute@aecom.com
 or via mail to: AECOM
 Attn: Kauai New Landfill/RRP Access Roads
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

All responses must be received by Monday, October 17, 2016.

Access Route A: MA'ALO ROAD

(A1) Advantages for Access Route A (and Driveway 1 or 2):

(A2) Disadvantages for Access Route A (and Driveway 1 or 2):

Access Route B: 'EHIKU STREET

(B1) Advantages for Access Route B (and Driveway 1 or 2):

(B2) Disadvantages for Access Route B (and Driveway 1 or 2):

Access Route C: LAULIMA STREET

(C1) Advantages for Access Route C:

(C2) Disadvantages for Access Route C:

Access Route D: ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D:

(D2) Disadvantages for Access Route D:

Appendix C.3
Written Public Comments

From: [REDACTED]
Sent: Friday, January 17, 2014 6:46 PM
To: AMER-US-HI Honolulu-KauaiAccessRoads
Subject: Comments ehiku st.

(B2) disadvantages for access route B- I would like to express my concerns about you using ehiku st. As an access route. First off I think it would be a big safety concern if you would choose this route because it would be running through a neighborhood with children and we have a park which is used by a lot of different sports for children!!!! Also I live on Ehiku st. And I have 3 young boys 7, 4, and 2. Which would be a great hazard for them with all the big trash trucks going by!!! It would also create a lot more traffic on Ehiku st. Which would make it a lot more difficult and dangerous for my wife and I to get out of our driveway with all those added vehicles passing through!!!! It will also make a lot more noise in our neighborhood!!!! Lastly you guys should put the landfill where Joann yukimura lives because she is so against burning the trash to produce energy!!!!!!!!!!!!

(D1) Advantages for access route D- if you guys do have to make the landfill in Ma'alo than I would have to say use the Roberts entrance because it is the furthest away from all neighborhoods!!! It would also be a lot cheaper than the Ehiku st. Route. You would also have a lot less foot traffic compared to any other of the access route.

Could you please send me an e-mail back to say that you did receive my concerns and comments.

Thank you for your time.

From: [REDACTED]
Sent: Friday, January 17, 2014 1:06 PM
To: AMER-US-HI Honolulu-KauaiAccessRoads
Subject: Public Comments on TREFS: Access Route Alternatives for the Proposed New Landfill and RRP

[REDACTED]
[REDACTED]
January 17, 2014

AECOM
Attn: Kauai New Landfill/RRP Access Roads
1001 Bishop Street Suite 1600
Honolulu, HI 96813

To Whom it may Concern:

Rather than information on access routes to the proposed Ma'alo Landfill, the majority of those present at the January 16 public meeting were more interested in discussing the choice of Ma'alo as the preferred dump site. Before offering my opinion on the Ma'alo site, I would like to express thoughts about access routes:

In September, 2010, Mayor Carvalho announced that Ma'alo had jumped from 6th to 1st place as the preferred new landfill site. A major selling point of the Ma'alo site was that it would provide the opportunity to develop a bypass road between Wailua and Puhi. Oddly, at the January 16 presentation, a bypass road was not even mentioned or considered as a route to the proposed landfill. Even after brought up by members of the audience, the presenters attempted to steer away from discussing a bypass road.

The bypass road that was described in 2010 would avoid heavy traffic as well as populated communities. **IF** Ma'alo becomes our next landfill, a bypass road as originally proposed, between Rapozo Crossing on the west and across Kaua'i Beach Resort from east, would keep the huge dump trucks off our busy streets, avoid communities, and alleviate heavy traffic in Hanama'ulu and Lihu'e Town.

I understand that, until we find a better solution for our trash problems, Kaua'i needs a landfill. However, I strongly believe that the Ma'alo site presents a very real threat, not only to our environment, but also to the health and well being of mankind. A landfill, whose lifespan is 264 years, sited at high elevation, surrounded by wetlands and at

least 4 reservoirs, with more than 600 households located only several miles below, and hundreds of miles of irrigation ditches used for as much as 1000 acres of agricultural land to produce food for human consumption, is a very scary thing, not just for Hanama'ulu, but for all of Kaua'i.

I strongly suggest that our county reconsider Ma'alo as the chosen site for our landfill.

Sincerely,

A solid grey rectangular box used to redact the signature of the sender.

Driveways 1 and 2 (Access Routes A and B)

(E1) Advantages for Driveway 1 / Disadvantages for Driveway 2:

(E2) Disadvantages for Driveway 1 / Advantages for Driveway 2:

General Questions for Respondents

(QG1) Where do you currently live (circle one):

1. One the island of Kaua'i [Zipcode or Community: _____]
2. On the island of Ni'ihau
3. On another island in Hawai'i
4. Outside the State

(QG2) How long have you lived in the County of Kaua'i (years): _____

If you would like to receive feedback on the results of this survey, please provide your contact information (postal or email address) below. All contact items are voluntary.

Name and Address: _____

e-mail address: _____

If provided, your contact information will be maintained for communication purposes only, until the Final EIS is issued. No information you supply on this form will be released to any person or agency without your prior permission. No information reported during the course of this project will be attributed to any individual or any agency without prior approval. Data will be reported in aggregate form only.

ACCESS ROUTES PUBLIC COMMENT SHEET

Proposed New Municipal Solid Waste Landfill and Resource Recovery Park at Ma'alo, Kaua'i

BACKGROUND INFORMATION

The enclosed **Fact Sheet** describes the potential Access Routes A, B, C, and D, and summarizes the preliminary results of the **DRAFT TRAFFIC AND ROADWAYS ENGINEERING FEASIBILITY STUDY (TREFS)**. Further details of the potential access routes are provided in the Draft TREFS report, available on the County of Kaua'i's New Landfill website: www.kauai.gov/NewLandfillSite

For each route, the Draft TREFS report provides detailed analysis of existing and projected traffic conditions and impacts; recommended improvements and associated cost estimates; and a preliminary evaluation of the potential social impacts.

PUBLIC OUTREACH

This public outreach is being conducted in response to public concerns regarding the access routes expressed during meetings held for the ongoing project Environmental Impacts Statement (EIS) process. The County is committed to soliciting and considering all reasonable public concerns regarding the potential access routes. No final decision regarding the proposed access route has been made, and the proposed access route will be further analyzed during the ongoing EIS process. Public comments will be considered, along with other engineering, environmental, and cost data to assist the County of Kaua'i in selecting the best access route to the Ma'alo Landfill Site.

INSTRUCTIONS

Please review the Fact Sheet, and preferably the Draft TREFS report, which are intended to summarize the analyses performed, prior to providing your comments this comment sheet. For each route, please list the advantages and disadvantages, if any, you think that access route has for the site, the nearby communities, or the residents and businesses of the County of Kaua'i.

If you feel that one of the advantages or disadvantages is most important, please circle it. If you feel that any particular route has no advantages or disadvantages, please leave that section empty. Attach a separate sheet, if necessary, and please remember to circle or otherwise indicate the most important advantage or disadvantage of this route, if applicable.

Comments can be submitted via e-mail to: KauaiAccessRoads@aecom.com

or via mail to: AECOM

Attn: Kauai New Landfill/RRP Access Roads
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

All responses must be received by February 10, 2014.

Access Route A: MA'ALO ROAD

(A1) Advantages for Access Route A:
DOES NOT IMPACT EXISTING RESIDENCES

(A2) Disadvantages for Access Route A:
TOO LONG / EXPENSIVE
PLUS LENGTH INCREASE DELIVERY COSTS IN FUTURE

Access Route B: 'EHIKU STREET

(B1) Advantages for Access Route B:
NONE

(B2) Disadvantages for Access Route B:
TOO LONG / EXPENSIVE
PLUS LENGTH INCREASES DELIVERY COSTS IN FUTURE
IMPACTS KUHIO HIGHWAY WHERE MOST CROWDED

Access Route C: LAULIMA STREET

(C1) Advantages for Access Route C:
~~CHEAPEST~~ CHEAPEST / LEAST EXPENSIVE

(C2) Disadvantages for Access Route C:
IMPACTS EXISTING RESIDENCES

Access Route D: ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D:
2ND LEAST EXPENSIVE
LESS IMPACT ON EXISTING RESIDENCES

(D2) Disadvantages for Access Route D:

Driveways 1 and 2 (Access Routes A and B)

(E1) Advantages for Driveway 1 / Disadvantages for Driveway 2:

(E2) Disadvantages for Driveway 1 / Advantages for Driveway 2:

General Questions for Respondents

(QG1) Where do you currently live (circle one):

- One the island of Kaua'i [Zipcode or Community: LIHUE]
- On the island of Ni'i'hau
- On another island in Hawai'i
- Outside the State

(QG2) How long have you lived in the County of Kaua'i (years): 31 yrs

If you would like to receive feedback on the results of this survey, please provide your contact information (postal or email address) below. All contact items are voluntary.

Name and Address:

e-mail address:

If provided, your contact information will be maintained for communication purposes only, until the Final EIS is issued. No information you supply on this form will be released to any person or agency without your prior permission. No information reported during the course of this project will be attributed to any individual or any agency without prior approval. Data will be reported in aggregate form only.

ACCESS ROUTES PUBLIC COMMENT SHEET

Proposed New Municipal Solid Waste Landfill and Resource Recovery Park at Ma'alo, Kaua'i

BACKGROUND INFORMATION

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For each route, the Draft TREFS report provides detailed analysis of existing and projected traffic conditions and impacts; recommended improvements and associated cost estimates; and a preliminary evaluation of the potential social impacts.

PUBLIC OUTREACH

This public outreach is being conducted in response to public concerns regarding the access routes expressed during meetings held for the ongoing project Environmental Impacts Statement (EIS) process. The County is committed to soliciting and considering all reasonable public concerns regarding the potential access routes. No final decision regarding the proposed access route has been made, and the proposed access route will be further analyzed during the ongoing EIS process. Public comments will be considered, along with other engineering, environmental, and cost data to assist the County of Kaua'i in selecting the best access route to the Ma'alo Landfill Site.

INSTRUCTIONS

Please review the Fact Sheet, and preferably the Draft TREFS report, which are intended to summarize the analyses performed, prior to providing your comments this comment sheet. For each route, please list the advantages and disadvantages, if any, you think that access route has for the site, the nearby communities, or the residents and businesses of the County of Kaua'i.

If you feel that one of the advantages or disadvantages is most important, please circle it. If you feel that any particular route has no advantages or disadvantages, please leave that section empty. Attach a separate sheet, if necessary, and please remember to circle or otherwise indicate the most important advantage or disadvantage of this route, if applicable.

Comments can be submitted via e-mail to: KauaiAccessRoads@aecom.com
 or via mail to: AECOM
 Attn: Kauai New Landfill/RRP Access Roads
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

All responses must be received by February 10, 2014.

Access Route A: MA'ALO ROAD

(A1) Advantages for Access Route A:

(A2) Disadvantages for Access Route A:

Access Route B: 'EHIKU STREET

(B1) Advantages for Access Route B:

(B2) Disadvantages for Access Route B:

Access Route C: LAULIMA STREET

(C1) Advantages for Access Route C:

(C2) Disadvantages for Access Route C:

Access Route D: ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D:

1. COST ALTHOUGH NOT CHEAPEST HAS MORE AREA TO INTERSECT ^{WEST} ^{AREA}
2. DOES NOT IMPACT NEIGHBORHOODS

(D2) Disadvantages for Access Route D:

INCREASE TRAFFIC FROM WEST SIDE. MORE TRAFFIC ON NUHOU RD., PIKAKE ST, NAUWILUWILI & KAPUNA HIGHWAY

Driveways 1 and 2 (Access Routes A and B)

(E1) Advantages for Driveway 1 / Disadvantages for Driveway 2:

Empty table for handwritten responses to E1.

(E2) Disadvantages for Driveway 1 / Advantages for Driveway 2:

- avoids area w/wetland

Empty table for handwritten responses to E2.

General Questions for Respondents

(QG1) Where do you currently live (circle one):

- 1. One the island of Kaua'i [Zipcode or Community: 96766]
- 2. On the island of Ni'ihau
- 3. On another island in Hawai'i
- 4. Outside the State

(QG2) How long have you lived in the County of Kaua'i (years): 53 years ^(life)

If you would like to receive feedback on the results of this survey, please provide your contact information (postal or email address) below. All contact items are voluntary.

Name and Address:



e-mail address:

If provided, your contact information will be maintained for communication purposes only, until the Final EIS is issued. No information you supply on this form will be released to any person or agency without your prior permission. No information reported during the course of this project will be attributed to any individual or any agency without prior approval. Data will be reported in aggregate form only.

ACCESS ROUTES PUBLIC COMMENT SHEET

Proposed New Municipal Solid Waste Landfill and Resource Recovery Park at Ma'alo, Kaua'i

BACKGROUND INFORMATION

The enclosed Fact Sheet describes the potential Access Routes A, B, C, and D, and summarizes the preliminary results of the DRAFT TRAFFIC AND ROADWAYS ENGINEERING FEASIBILITY STUDY (TREFS). Further details of the potential access routes are provided in the Draft TREFS report, available on the County of Kaua'i's New Landfill website: www.kauai.gov/NewLandfillSite

For each route, the Draft TREFS report provides detailed analysis of existing and projected traffic conditions and impacts; recommended improvements and associated cost estimates; and a preliminary evaluation of the potential social impacts.

PUBLIC OUTREACH

This public outreach is being conducted in response to public concerns regarding the access routes expressed during meetings held for the ongoing project Environmental Impacts Statement (EIS) process. The County is committed to soliciting and considering all reasonable public concerns regarding the potential access routes. No final decision regarding the proposed access route has been made, and the proposed access route will be further analyzed during the ongoing EIS process. Public comments will be considered, along with other engineering, environmental, and cost data to assist the County of Kaua'i in selecting the best access route to the Ma'alo Landfill Site.

INSTRUCTIONS

Please review the Fact Sheet, and preferably the Draft TREFS report, which are intended to summarize the analyses performed, prior to providing your comments this comment sheet. For each route, please list the advantages and disadvantages, if any, you think that access route has for the site, the nearby communities, or the residents and businesses of the County of Kaua'i.

If you feel that one of the advantages or disadvantages is most important, please circle it. If you feel that any particular route has no advantages or disadvantages, please leave that section empty. Attach a separate sheet, if necessary, and please remember to circle or otherwise indicate the most important advantage or disadvantage of this route, if applicable.

Comments can be submitted via e-mail to: KauaiAccessRoads@aecom.com

or via mail to: AECOM

Attn: Kauai New Landfill/RRP Access Roads
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

All responses must be received by February 10, 2014.

Access Route A:

MA'ALO ROAD

(A1) Advantages for Access Route A:

Would improve road - a plus for those visitors going up to Waimea Falls too.

(A2) Disadvantages for Access Route A:

Cost

Access Route B:

'EHIKU STREET

(B1) Advantages for Access Route B:

Partial improvements to Maalo Rd (see above) - lesser ~~is~~ impact on Neighborhood

(B2) Disadvantages for Access Route B:

Cost due to length of road access - longer route

Access Route C:

LAULIMA STREET

(C1) Advantages for Access Route C:

Most cost effective giving ~~community~~ ^{community} another traffic light - may help morning traffic back-up - shortest length

(C2) Disadvantages for Access Route C:

another traffic light ~~is~~ w/in a short distance

Access Route D:

ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D:

(D2) Disadvantages for Access Route D:

- may be flood-prone
- traffic light so close to the Hanamaulu intersection

Driveways 1 and 2 (Access Routes A and B)

(E1) Advantages for Driveway 1 / Disadvantages for Driveway 2:

[This section is crossed out with a large handwritten 'X']

(E2) Disadvantages for Driveway 1 / Advantages for Driveway 2:

[This section is crossed out with a large handwritten 'X']

General Questions for Respondents

(QG1) Where do you currently live (circle one):

1. One the island of Kaua'i [Zipcode or Community: Hanalei, Larkana Bt.
2. On the island of Ni'ihau
3. On another island in Hawai'i
4. Outside the State

(QG2) How long have you lived in the County of Kaua'i (years): 70 + yrs.

If you would like to receive feedback on the results of this survey, please provide your contact information (postal or email address) below. All contact items are voluntary.

Name and Address: 

e-mail address: 

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ACCESS ROUTES PUBLIC COMMENT SHEET

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INSTRUCTIONS

Please review the Fact Sheet, and preferably the Draft TREFS report, which are intended to summarize the analyses performed, prior to providing your comments this comment sheet. For each route, please list the advantages and disadvantages, if any, you think that access route has for the site, the nearby communities, or the residents and businesses of the County of Kaua'i.

If you feel that one of the advantages or disadvantages is most important, please circle it. If you feel that any particular route has no advantages or disadvantages, please leave that section empty. Attach a separate sheet, if necessary, and please remember to circle or otherwise indicate the most important advantage or disadvantage of this route, if applicable.

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 or via mail to: AECOM
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Access Route A: MA'ALO ROAD

(A1) Advantages for Access Route A:
This is the only route I support

(A2) Disadvantages for Access Route A:
How about Ma'alo rd that ~~is~~ has existing haul
eune rd to cross route C.

I live on the Laukaha St. routes please reconsider
not happy about landfill already. Thank you.

Access Route B: 'EHIKU STREET

(B1) Advantages for Access Route B:

(B2) Disadvantages for Access Route B:

Access Route C: LAULIMA STREET

(C1) Advantages for Access Route C:

(C2) Disadvantages for Access Route C:

Access Route D: ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D:

(D2) Disadvantages for Access Route D:

Driveways 1 and 2 (Access Routes A and B)

(E1) Advantages for Driveway 1 / Disadvantages for Driveway 2:
Handwritten notes in this section are mostly illegible.

(E2) Disadvantages for Driveway 1 / Advantages for Driveway 2:
Goer through agricultural land

General Questions for Respondents

(QG1) Where do you currently live (circle one):
1. One the island of Kaua'i [Zipcode or Community: 96746]
2. On the island of Ni'ihau
3. On another island in Hawai'i
4. Outside the State

(QG2) How long have you lived in the County of Kaua'i (years): 64

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PUBLIC OUTREACH

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INSTRUCTIONS

Please review the Fact Sheet, and preferably the Draft TREFS report, which are intended to summarize the analyses performed, prior to providing your comments this comment sheet. For each route, please list the advantages and disadvantages, if any, you think that access route has for the site, the nearby communities, or the residents and businesses of the County of Kaua'i.

If you feel that one of the advantages or disadvantages is most important, please circle it. If you feel that any particular route has no advantages or disadvantages, please leave that section empty. Attach a separate sheet, if necessary, and please remember to circle or otherwise indicate the most important advantage or disadvantage of this route, if applicable.

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Honolulu, HI 96813

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Access Route A: MA'ALO ROAD

(A1) Advantages for Access Route A:
Existing road

(A2) Disadvantages for Access Route A:
Road too narrow
Would take traffic through agricultural area
Long route
Traffic congestion possible
Cost

Access Route B: 'EHIKU STREET

(B1) Advantages for Access Route B:

(B2) Disadvantages for Access Route B:
Too close to housing
Traffic congestion possible
Cost

Access Route C: LAULIMA STREET

(C1) Advantages for Access Route C:
Short route

(C2) Disadvantages for Access Route C:
Too close to housing

Access Route D: ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D:
Avoids transit through populated areas
Is the shortest route
Direct access from East + North Kawai

(D2) Disadvantages for Access Route D:
Possible congestion at intersection
Still relatively close to housing but less than other options.

Driveways 1 and 2 (Access Routes A and B)

(E1) Advantages for Driveway 1 / Disadvantages for Driveway 2: *Disagree!*

(E2) Disadvantages for Driveway 1 / Advantages for Driveway 2: *Disagree!*

General Questions for Respondents

(QG1) Where do you currently live (circle one):
 1. One the island of Kaua'i [Zipcode or Community: _____]
 2. On the island of Ni'ihau
 3. On another island in Hawai'i
 4. Outside the State

(QG2) How long have you lived in the County of Kaua'i (years): 18 yrs.

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Access Route A: MA'ALO ROAD

(A1) Advantages for Access Route A: Disagree!

(A2) Disadvantages for Access Route A: Disagree!

Access Route B: 'EHIKU STREET

(B1) Advantages for Access Route B: Disagree!

(B2) Disadvantages for Access Route B: Disagree!

Access Route C: LAULIMA STREET

(C1) Advantages for Access Route C: Disagree!

(C2) Disadvantages for Access Route C: Disagree!

Access Route D: ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D: Disagree!

(D2) Disadvantages for Access Route D: Disagree!

Driveways 1 and 2 (Access Routes A and B)

(E1) Advantages for Driveway 1 / Disadvantages for Driveway 2: DENIED

(E2) Disadvantages for Driveway 1 / Advantages for Driveway 2: DENIED

General Questions for Respondents

(QG1) Where do you currently live (circle one):
 1. One the island of Kaua'i [Zipcode or Community: _____]
 2. On the island of Ni'ihau
 3. On another island in Hawai'i
 4. Outside the State

(QG2) How long have you lived in the County of Kaua'i (years): 35 yrs.

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e-mail address: _____

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Honolulu, HI 96813

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Access Route A: MA'ALO ROAD

(A1) Advantages for Access Route A: DENIED

(A2) Disadvantages for Access Route A: DENIED

Access Route B: 'EHIKU STREET

(B1) Advantages for Access Route B: DENIED

(B2) Disadvantages for Access Route B: DENIED

Access Route C: LAULIMA STREET

(C1) Advantages for Access Route C: DENIED

(C2) Disadvantages for Access Route C: DENIED

Access Route D: ROBERTS HAWAII DRIVEWAY

(D1) Advantages for Access Route D: DENIED

(D2) Disadvantages for Access Route D: DENIED

Appendix C.4
Summary of Interview Comments

Appendix C.4 Contents

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**County of Kaua'i
Socioeconomic Assessment of Proposed Solid Waste Landfill at Ma'alo
Access Roads Assessment Component
Version: July 2013**

Interview

Raymond J. McCormick, District Engineer, Kaua'i, Department of Transportation

Tuesday, October 13, 2013, his office

Record name, address, employer or other organization respondent may represent.

1. A solid waste landfill operation has been proposed for the site known as Ma'alo. How familiar are you with the Ma'alo site? [If necessary, use the site map to show the respondent the general layout of the Ma'alo site.]
2. Are you generally in favor of or opposed to placing the next Kaua'i landfill at Ma'alo?
3. Why do you say that? [Not all issues offered, not the order or relative importance assigned to access roads among all other issues.]

Mr. McCormick has been with the Hawai'i Department of Transportation on Kaua'i for many years and has been involved in discussions of Kaua'i Solid Waste Landfill sites since their inception. He has participated in project meetings and community meetings on the issues involved. He has had several conversations with the County Department of Solid Waste Management on specific issues in and around the Ma'alo Landfill site. Mr. McCormick felt that he was well informed on the Ma'alo site and other transportation-related issues in the area of the proposed site.

Any final decision to locate the next landfill at Ma'alo will depend on the outcome of the Environmental Impact Statement. What we are interested in today is the location of access roads and driveways to get to the site. I have a map with some alternative road alignments overlaid on it. None of the alignments are final in any way, but engineers have calculated that each of them is a feasible alternative. We would like you to go over them with us and get your opinion on what you think might be the advantages and disadvantages of each one. Our major interest is in advantages and disadvantages that will affect the people in the surrounding communities, rather than engineering issues or cost factors. [Show map and discuss each alignment in turn. At each alternative alignment ask the following questions.]

4. What are the advantages of this one, as it will affect the community? What are the disadvantages you see? [Record positive and negative issues for each if any.]

A: (See Potential Access Road A): Mr. McCormick spoke at length about potential access road A. He was not in favor of this alternative. He felt the intersection of Ma'alo Road and Kūhiō Highway presented serious problems for traffic and driver safety. He felt those issues might take considerable money and time to resolve and that would not be beneficial to a project with a short timeframe. He noted several roadway alignment problems along Ma'alo Road between Kūhiō Highway and the point where Ma'alo Road intersects 'Ehiku Road (see attached Potential Access Road B). Those included some very tight turns, narrow roadways, and the narrow bridge. He also noted that the State did not have easements along Ma'alo Road and that might require acquiring easements or property. Property acquisition would require additional funding and time that would complicate the completion of site preparations. He also noted that tourist traffic along Ma'alo Road would be negatively affected by trucks accessing the landfill site and may pose a danger to Kaua'i's visitors. He felt potential access road A was not a good choice for the Ma'alo Solid Waste Landfill access road.

- B. (See Potential Access Road B): Mr. McCormick studied this route for a few minutes and then said he thought it was a very good solution for Ma'alo Road problems. By using 'Ehiku Road, potential access road B avoids virtually all of the major problems of potential access road A, with the exception of visitor traffic. He thought that might be an advantage. The new route to the waterfall might pull visitor traffic off Kūhiō Highway and the lower end of Ma'alo Road. It would be preferable for its both scenic advantages and traffic safety. He mentioned that the alignment takes potential access road B through the Isenberg Neighborhood and noted that could be a public relations issue. He did not feel that it seriously compromised the many advantages of potential access road B, however.
- C. (See Potential Access Road C): Mr. McCormick studied the map for a few minutes. He then said this would be an acceptable access road alignment. It had the advantage of leaving Kūhiō Highway at the industrial park and therefore avoided passing through residential areas. He also noted that there was available land on the mauka side of Kūhiō Highway that could be used to get trucks off the road before turning. He realized, however that signalization of the intersection would probably be required. He said he could accept potential access road C, but that it was not superior to potential access road B.
- D. (See Potential Access Road D): Mr. McCormick did not find any advantage in the alternative. While it might avoid placing a signal at the intersection of Laulima Road and Kūhiō Highway, it would be difficult to get trucks on and off Kūhiō Highway so close to the intersection of Kūhiō Highway and Kapule Highway. In peak periods, traffic backs up well beyond the point where potential access road D enters Kūhiō Highway. He recognized the benefit to the Hanamā'ulu Neighborhood this would provide, but felt the traffic issues would offset that advantage.

5. Out of all of the alternatives, which alignment do you think will be best for the community and landfill users?

Mr. McCormick is strongly in favor of potential access road alignment B. He continues to be very strongly opposed to potential access road A and feels potential access road D will not work. He said he could accept potential access road C, but that it was not as good an option as potential access road B.

To connect the Ma'alo landfill site and the RRP site, Mr. McCormick prefers driveway alignment 2 to driveway alignment 1. He understands the wetlands issue well and feel that routing any roadways through wetlands areas will involve negotiations and mitigations that will be very costly. The major problem would be the time it would take to deal with the Federal government on wetlands issues. Wetlands issues can also open the way for local residents to re-evaluate the site selection. He was very strongly in favor of potential driveway alignment 2.

6. What is the most important advantage of the alignment you chose?

Mr. McCormick reiterated all of the favorable points he listed earlier (see B, above). If he had to pick one of those, it would be avoiding the traffic safety and realignment problems associated with using the lower end of Ma'alo Road.

7. Is there any alignment that you find wholly unacceptable? If so, which one is that?

None was "wholly unacceptable," but potential access road A and potential access road D are not good options.

8. And why do you say that?

See 7 above.

County of Kaua'i
Socioeconomic Assessment of Proposed Solid Waste Landfill at Ma'alo
Access Roads Assessment Component
Version: July 2013

Interview

Anonymous

Thursday, October 3, 2013
Līhu'e, Hawai'i 96766

Record name, address, employer or other organization respondent may represent.

1. A solid waste landfill operation has been proposed for the site known as Ma'alo. How familiar are you with the Ma'alo site? [If necessary, use the site map to show the respondent the general layout of the Ma'alo site.]
2. Are you generally in favor of or opposed to placing the next Kaua'i landfill at Ma'alo?
3. Why do you say that? [Not all issues offered, not the order or relative importance assigned to access roads among all other issues.]

Respondent has been involved in deliberations and planning for a possible landfill operation in the Kalepa-Ma'alo area throughout the last three Kaua'i Mayoral Administrations. He is very familiar with all the issues involved. He was interviewed in the previous set of stakeholder interviews for this Socioeconomic Impact Assessment (SIA). At that time, he registered general approval of the site in its current configuration and says that he still strongly supports Ma'alo as the best site for the next landfill on Kaua'i. He and his company also have many concerns and interests related to the details of the proposed project. He continues to work toward a plan that will work for all.

Any final decision to locate the next landfill at Ma'alo will depend on the outcome of the Environmental Impact Statement. What we are interested in today is the location of access roads and driveways to get to the site. I have a map with some alternative road alignments overlaid on it. None of the alignments is final in any way, but engineers have calculated that each of them is a feasible alternative. We would like you to go over them with us and get your opinion on what you think might be the advantages and disadvantages of each one. Our major interest is in advantages and disadvantages that will affect the people in surrounding communities, rather than engineering issues or cost factors. [Show map and discuss each alignment in turn. At each alternative alignment ask the following questions.]

4. What are the advantages of this one, as it will affect the community? What are the disadvantages you see? [Record positive and negative issues for each if any.]
 - A. (See Potential Access Road A): That's just Ma'alo Road. That's not really an access road. It's already there. (Redirected the conversation toward the driveways). Any of those (1, 2, or 1 & 2) would work. I'm not sure why they don't just use the roads that are there. There's already a blacktop road that runs from Ma'alo Road to the site (he indicated the earlier site of the RRP, a section between driveway alignment 2 and driveway alignment 3). That just seems easier. Things keep changing all the time. I wish they would just choose a plan and go with it.
 - B. (See Potential Access Road B): That's never going to work. This community (indicated the Isenberg subdivision) will never go for it. They are vocal and powerful (paraphrasing). The roadway is already there, but it just has too many problems. I know the Department (Planning) and the State have a lot of issues about the intersection at Ma'alo and Kūhiō Highway, but we may just have to deal with those. B is not going to work.

- C. (See Potential Access Road C): I don't like this alignment. The problem is driveway alignment 3. It splits this agricultural land and it's just not the right way to go. Farmers will have a problem here. But the real issue is why they don't connect through here [indicates a section of roadway connecting the intersection of Access Road C and Driveway 3 with the point at which Ma'alo Road meets 'Ehiku Street (A and B)]. That would complete the loop and allow access from two directions. It would also follow the existing roadways and save time and money. This led to a discussion of the "loop" and the fact that "the loop" was essentially the bypass road. Respondent noted that there had been an announcement that planning for the bypass had already begun, and that it would change the need for access roads. I suggested that there had been a decision to treat the bypass road and the landfill site as separate projects. Respondent said it was more realistic to treat them together, but accepted the decision. He maintained, throughout, however, that the connection of the two sets of roadways (A or A & B vs. C/D) made the most sense and was best for the community.
- D. (See Potential Access Road D): Access road alignment D is not much different from alignment C. It still brings the road onto the wrong side of the property. It still uses driveway 3, which benefits no one. It still doesn't complete the loop. I can see it's better than C because it gets the trucks out of Hanamā'ulu, but it's not a choice I can support.

5. OK, out of all of the alternatives, which alignment do you think will be best for the community and landfill users?

I don't like any of them. If you're going to do something like this (the set of alternatives), then just use Ma'alo Road. You can't go through 'Ehiku because of community reaction. Driveway 3 doesn't work for the community. Just do the work on Ma'alo Road. It's dangerous now and everyone who uses it would benefit from straightening it out a little and fixing the bridge.

6. What is the most important advantage of the alignment you chose?

It is not a great solution. Many of us have been working with the administration since Brian Baptiste was mayor. We have worked these things out a dozen times. We have told them that we wanted to avoid splitting agricultural properties and that they should use existing roadways if they can. I think we will have to get back, talk with the administration, and find out how to fix these things.

7. Is there any alignment that you find wholly unacceptable? If so, which one is that?

Nothing is impossible. Nearly everyone wants to see this go through. We can get together with the County and work this out.

Respondent appreciated the effort to get these preliminary plans out to them before any public announcement or adoption in the plan.

8. In addition, why do you say that?

N/A

9. If the respondent proposes an alternative that is not on the map, describe that alignment and the rationale for choosing it.

See above.

**County of Kaua'i
Socioeconomic Assessment of Proposed Solid Waste Landfill at Ma'alo
Access Roads Assessment Component**

Interview

Anonymous

Līhu'e, Kaua'i, Hawai'i, 96766

Monday, January 13, 2014

This interview used the Information Sheet and the Data Gathering Sheet used for the Public Meeting and the landowner survey as a basis for the interview.

Respondent has been with his current employer for the major part of his career and has been in his current position for about ten years. He is quite familiar with the area near his current place of employment, including traffic patterns along Kūhiō Highway. He is aware of the planning effort that has led up to the choice of the Ma'alo Landfill Site. He was not aware of exactly where the site was to be located. He understands the need for a new landfill site and generally approves of the County's effort to locate a suitable site. He has heard that the Ma'alo Site may be better situated than other alternative site locations. Respondent was not familiar with all of the characteristics of the site, but felt it was out-of-the-way and not near anyone's home.

What we are interested in today is the location of access roads and driveways to get to the site. I have some maps showing four alternative road alignments. None of the alignments is final in any way, but engineers have calculated that each of them is a feasible alternative. We would like you to go over them with us and get your opinion on what you think might be the advantages and disadvantages of each one. Our major interest is in advantages and disadvantages that will affect the people in the surrounding communities, rather than engineering issues or cost factors. What are the advantages of this one, as it will affect the community? What are the disadvantages you see?

- A. Access Route A, Ma'alo Road: Respondent recognized Ma'alo Road and knew it to be a scenic route that ended at Wailua Falls. He saw no reason why it could not be used as an access road for the landfill. He knew the intersection of Ma'alo Road and Kūhiō Highway was a dangerous intersection that had been the scene of several serious accidents in the past. He said that intersection would have to be "fixed" if Ma'alo Road was to be used for truck traffic.
- B. Access Route B, 'Ehiku Street: Respondent was less familiar with the 'Ehiku Street route. He suspected it was largely comprised of cane haul roads that had not been used in several years. He also said that the lower end of the road passed by the AT&T offices and a warehouse and two churches. That might be a problem for those businesses. Although this route was close to his current place of employment, he did not think it would have any impact on the company or its operations. He noted that route B was longer than route A and that might make it more expensive to build.
- C. Access Route C, Laulima Street: Being less familiar with the Laulima Street routes, Respondent had fewer comments about that route. He thought it was a much shorter route and that might make it less expensive to build. Being even farther from his current place of employment than 'Ehiku Street, he felt it would have no impact on the company or its clients.

- D. Access Route D: Roberts Hawai'i Driveway: Respondent was not familiar with the Roberts Hawai'i Driveway and took a moment to become familiar with the map. He asked what the development between the driveway and Kūhiō Highway was. When I told him it was Kalepa Village, he recognized the site. He thought the access road might pass very near the Kalepa Village and was concerned that it may cause hardship for residents there. The trucks would cause noise, and dust along their back yards. The location was far from his current place of employment so it would have no impact on their operations.
- E. Driveways 1 and 2, Access Routes A and B: Respondent said he was not familiar with the area in which those driveways would be located. Driveway 1 seemed a straighter, more direct route to the landfill site and was therefore preferable to driveway 2. He saw no other advantages or disadvantages for either driveway.

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This interview used the Information Sheet and the Data Gathering Sheet used for the Public Meeting and the landowner survey as a basis for the interview.

Respondent, by virtue of his many years of public service, is very much aware of the proposed municipal solid waste landfill site at Ma'alo. He is also familiar with the history and issues surrounding the landfill and understood the need to consider access routes to the site. This interview was the first time he had seen maps of the four alternative access routes.

What we are interested in today is the location of access roads and driveways to get to the site. I have some maps showing four alternative road alignments. None of the alignments is final in any way, but engineers have calculated that each of them is a feasible alternative. We would like you to go over them with us and get your opinion on what you think might be the advantages and disadvantages of each one. Our major interest is in advantages and disadvantages that will affect the people in the surrounding communities, rather than engineering issues or cost factors. What are the advantages of this one, as it will affect the community? What are the disadvantages you see?

- A. Access Route A, Ma'alo Road: Ma'alo Road would be the choice that would come first to mind for most residents of Kaua'i, he thought. It had been talked about for some time, and many understand the advantages and disadvantages of the route. One of its advantages might be that Ma'alo Road has been considered to be the most likely access road to a Ma'alo landfill site. The route is direct and does not pass by private residences.

He thought Route A might be costly to develop because the road was narrow and has some sharp turns in it. Respondent recalled Council conversations about the problems posed by the intersection of Ma'alo Road and Kūhiō Highway. He expected that it would require significant redesign of the intersection, signalization, and pull-off lanes. Ma'alo Road is also a very long route, that takes the landfill trucks almost to Wailua Falls before meeting with driveway 1 to approach the site. He felt there must be a shorter route, using other cane haul roads, to get to the site from Ma'alo Road. We spend several minutes going over the maps to identify possible routes to the site. He noted also that tour buses used Ma'alo Road to take visitors to the Falls. Improvements to the road would have to take into consideration the fact that buses would be passing trucks on a frequent basis.

- B. Access Route B, 'Ehiku Street: Respondent had heard talk of using 'Ehiku Street as a possible route to the Ma'alo Landfill Site. He said it had been proposed as a means of avoiding the problems of improving the intersection at Ma'alo Road and Kūhiō Highway and some of the highest cost of improving the lower end of Ma'alo Road. He agreed those would be advantages of the 'Ehiku route. He also felt that the cane haul roads would make a solid base for improving 'Ehiku Street to its intersection with Ma'alo Road.

Respondent noted that the local community, residents of the Isenberg Neighborhood, had already voiced opposition to the idea of using 'Ehiku Street as a landfill access road. They had come together to successfully oppose locating a drug rehabilitation facility near their neighborhood. That demonstrated their ability and willingness to organize in support of their positions. He also felt that Route B, 'Ehiku Street, was the longest route to the landfill site and was likely to be the most expensive to develop. The more serious disadvantage, however, was community opposition.

- C. Access Route C, Laulima Street: The most obvious advantage of Route C, Respondent said, was the fact that it was short and direct. That might mean that it would have lower cost than the other routes and may provide fewer obstacles to overcome. The section along Laulima Street north of Kūhiō Highway passed by the industrial area but did not pass by any residences.

The biggest disadvantage was its impact on traffic at the intersection of Laulima Street and Kūhiō Highways. Hanamā'ulu residents were already telling him about the traffic delays all along Kūhiō as it passes through their town. The added truck traffic at Laulima Street would be a serious addition to the traffic flow. He hoped that traffic engineers could solve that problem, but wondered if improvements at the Laulima intersection would be enough. Looking at the map he also wondered if the road might pass too near residences along Laukona Street.

- D. Access Route D: Roberts Hawai'i Driveway: Respondent thought the Roberts Hawai'i Driveway was an interesting solution to many of the problems associated with Route C. Although the driveway made the route longer, it would have a solid base and it avoided the traffic problems associated with the Laulima Street Intersection with Kūhiō Highway. That would probably save some money and would certainly be preferred by residents of Hanamā'ulu Town.

He wondered, however, if the Roberts Hawai'i Driveway solution would not just move the problem down the road. Trucks would now use the Roberts Hawai'i Driveway entrance from Kūhiō Highway causing traffic problems there. If traffic engineers could solve that problem, it would remove a major disadvantage of Route D. He noticed, too, that Roberts Hawai'i Driveway passed near the north side of the Kalepa Villages Neighborhood. The access road would pass closer to Kalepa than it would to Laukona Street residences.

- E. Driveways 1 and 2, Access Routes A and B: Respondent asked why there were two alternative driveways to get from the Ma'alo Landfill Site to the RRP. I explained that driveway 2 was developed to avoid possible problems associated with wetland areas near driveway 1. He considered that to be a serious disadvantage for driveway 1. It is not impossible to develop roadways through wetlands, but the regulations governing use of wetland areas were usually time consuming and perhaps costly in the end.

When the formal part of the interview was finished, Respondent returned to the conversation about alternative ways to get from Ma'alo Road to the landfill site. He was now looking for an additional route from Kūhiō Highway to the Ma'alo Landfill Site. He suggested several alternatives, and then settled on a route that used Ma'alo Road from Kūhiō Highway to the intersection of Ma'alo Road and 'Ehiku Street, turned east across a cane haul road to the intersection of Laulima Street and driveway 3, and then proceeded along driveway 3 to the landfill site. This route, he felt, would eliminate serious downsides from 'Ehiku Street and those parts of Routes C and D that pass near residences, without incurring serious additional disadvantages.

Appendix C.5
Access Route F

The following figure shows Routes F1 and F2, which were suggested as potential alternative access routes during the January 16, 2014 TREFS Public Meeting. Some Social Impacts Assessment (SIA) respondents felt it would be useful to combine some elements of Routes A and B, with parts of C and D. Route F1 follows Ma'alo Road from its Kūhiō Highway junction for 1.8 miles to an intersection with 'Ehiku Street, where it turns right along an existing cane haul road. It proceeds eastward to the intersection with driveway 3 and then directly to the landfill site. Route F2 follows 'Ehiku Street from its Kūhiō Highway to an intersection with Ma'alo Road and then continues eastward along the path described above. If the alternate RRP site is implemented, then a portion of either Driveway 1 or 2 would be required, as shown in the figure.

The following improvements would be recommended for Route F1, as discussed in the analysis for Route A:

- Modify and signalize the highway intersection.
- Widen a small bridge and straighten a sharp curve on Ma'alo Road.
- Widen and repave Ma'alo Road; widen and pave the cane haul roads; provide utilities.

The following improvements would be recommended for Route F2, as discussed in the analysis for Route A:

- Modify and signalize the highway intersection.
- Widen a small bridge and straighten a sharp curve on Ma'alo Road.
- Widen and repave Ma'alo Road; widen and pave the cane haul roads; provide utilities.

The following improvements would be recommended for the new, approximately 0.7 mile long access route segment (labelled "F" in the figure below):

- Rebuild or bridge a washed-out and collapsed former culvert area just west of Driveway 3.
- Widen and pave the cane haul road; provide utilities.

Driveways 1, 2, and 3 would also require the improvements described in the main TREFS report.

The assessment of Routes F1 and F2 can be taken as the combination of advantages and disadvantages of their two components parts, as described in the main body of the SIA (TREFS report, Section 4). In general terms, both Routes F1 and F2 would likely have cost, traffic, and improvement requirements similar to those required for Routes A or B, without providing the primary benefits of Routes C or D, such as a shorter route, less expense, or less negative traffic impacts.

