
DRAFT Task 4: Deliverable E1
Project Evaluation and Preliminary Ranking
Memorandum
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Central Oahu Transportation Study

Prepared for
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Appendix B:	State of Hawaii Roosevelt Bridge Inspection Report
Appendix C:	OahuMPO Travel Demand Model Results

OVERVIEW OF THE CENTRAL OAHU TRANSPORTATION STUDY

The Central Oahu Transportation Study (COTS) will assess the multi-modal transportation needs of the region and identify key transportation system improvements, strategies and policies that can improve regional transportation mobility and access in a sustainable way. The strategies and system improvements will be technically feasible, financially realistic, sustainable, and meet regional transportation needs.

This report comprises the deliverable for **Task 4, Deliverable E1**. The full list of tasks are:

- Task 1: Coordinate and review past and on-going traffic, transit, and land use studies prepared by other agencies, establish a project management working group, and develop a stakeholder involvement process.
- Task 2: Identify performance measures and measures of economic sustainability to collect and establish a comprehensive baseline multi-modal transportation dataset.
- Task 3: Analyze and evaluate regional transportation, demographic, economic, and land use trends and issues.
- **Task 4: Determine and assess current and future multi-modal needs and opportunities for the region through technical methodologies, user survey and stakeholder outreach. The technical forecasting of future traffic, transit, land use, and other related projections will utilize and be done in coordination with OahuMPO's current travel demand forecast model and Congestion Management Process.**
- Task 5: Identify potential strategies and system improvements for key corridors in the region, including but not limited to, transit improvements with connections to the Honolulu rail transit system and H-2.
- Task 6: Assess order-of-magnitude of impacts of the potential strategies and system improvements utilizing identified performance measures. This order-of-magnitude assessment will include expected project and strategy implementation timing, project delivery costs including land acquisition, environmental impacts, and estimates of operations and maintenance costs.
- Task 7: Define the benefits and costs of the potential strategies and system improvements and compare those benefits and costs to each other.
- Task 8: Compare and prioritize those potential strategies and system improvements that meet the desired purpose mentioned above (technically feasible, financially realistic, and sustainable).
- Task 9: Develop recommendations and an implementation timeframe to set priorities for those strategies and system improvements.

Twelve deliverables document the results of the nine tasks and their subtasks. The reports include:

- A. Assessment of Previous Studies and Surveys associated with the study area and recommendations for further data collection or survey work as needed. Report A provides the assessment of the studies and surveys identified in two deliverables that have been submitted: List of Previous Studies and List of Previous Surveys.
- B. Identification of the Trends and Issues impacting the COTS area. This report will include the demographics, economics and land trends occurring in the study area as well as identify the impacts of those trends.
- B.2 Identification and definitions of Performance Measures, Sustainability Performance Measures, Baseline and Data Elements that will be used to guide and evaluate project alternatives.
- C. Data Memorandum that lists the information needed based upon Deliverables A through B.2 and documents the results of the data collection.
- D. A discussion of previous Alternatives as well as strategies for improvements will be presented in this report.
- E. **The Preliminary Ranking of Identified Projects is detailed in this report. TransCAD model using the OahuMPO model runs will provide data for conducting an initial evaluation and comparison of alternatives (as applicable). The outcome of these tasks will be a ranking of alternatives and their impacts on the study area.** A separate technical memorandum (Deliverable E-2) will be prepared summarizing the effectiveness of the TransCAD model as a planning tool for this study.
- F. Documents the Detailed Performance and Feasibility Assessment of the alternatives. Documentation will include identifying criteria for feasibility and sustainability assumptions; reporting on the impacts by performance measure (as described in Deliverable B.2) ; identification of environmental impacts and identified mitigations; and, assumptions for implementation all leading to a refinement of the alternative rankings.
- G. The Financial Assessment will be documented in this report. Financial assumptions and requirements including costs will be reviewed. The benefits and costs of the alternatives will be assessed and compared including any identified trade-offs.
- H. The Final Report on Prioritization and Recommendations for Implementation will summarize and prioritize strategies; identify recommendations; identify impacts of no implementation; recommend an implementation timeframe; and, identify any impacts if implementation is not accomplished within the recommended timeframe.
- I. This report will provide a summary of the Community Input and how that input was used to inform the study.
- J. Survey Results from any new surveys will be documented in this report.

Deliverable E1 is organized as follows:

- Overview of the COTS Project and this Deliverable
- Section 1: Introduction
- Section 2: Project Performance
- Section 3: Project Scoring and Ranking
- Section 4: Next Steps
- Section 5: Resources
- Appendix A: Detailed Initial Evaluation Matrix
- Appendix B: State of Hawaii Roosevelt Bridge Inspection Report
- Appendix C: OahuMPO Travel Demand Model Results

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1.0 INTRODUCTION

The Central Oahu Transportation Study (COTS) seeks to identify potential multi-modal transportation projects that could improve current and future mobility within the study area, reduce congestion, improve safety, and ensure efficient movement of people and goods.

The purpose of this report is to provide a preliminary ranking of the potential projects. This memo ranks their effectiveness based on a variety of factors, including their anticipated contribution towards the following:

- Expanding multimodal travel opportunities
- Reducing congestion
- Enhancing safety
- Increasing goods movement capacity
- Improving infrastructure

Inputs to this evaluation included quantitative findings, qualitative assessments, and adjustments to normalize the results where feasible for purposes of ranking each improvement project. Technical analyses were conducted as part of this evaluation to provide more detailed operational results where needed, and a comparative system was developed to prepare an initial ranking list using the criteria noted above.

This analysis, along with Deliverable E-2, Model Validation Memorandum, will culminate in recommendations for project implementation to achieve the contributions towards mobility as described above.

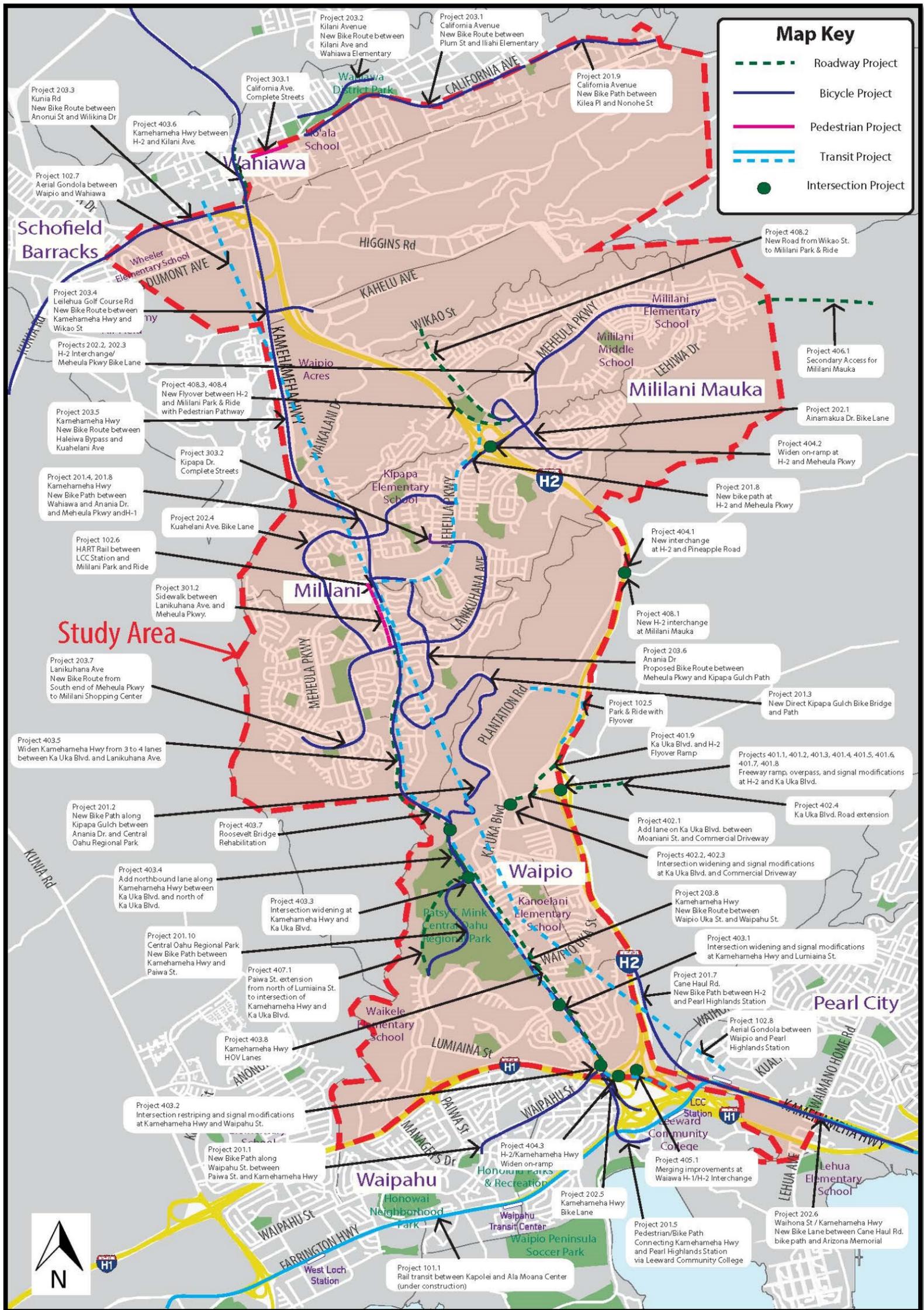
The remainder of this report includes the following:

- **Section 2.0:** Describes the study methodology and presents a more detailed description of each project coupled with an initial evaluation and recommendation for further evaluation
- **Section 3.0:** Presents the project ranking and scoring methodology, as well as a summary of the results in matrix format. Key findings are discussed in the accompanying text.

Figure 1 shows all of the projects considered within the study area. **Table 1** provides a listing of projects organized by transportation mode or program.

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Figure 1. Potential Projects Within the Study Area



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Table 1. List of Potential Projects

Project Number	Project Description	General Location	Source
100 TRANSIT PROJECTS			
101.0	GENERAL		
101.1	Bus Service Expansion	Islandwide	1,2,3,6
101.2	Construct Transit Centers	Islandwide	1,2,3,6
101.3	City Operations & Maintenance, including Bus Stop/Shelter Conditions	Islandwide	1,2,3,6
101.4	Human Services Transportation Coordination Program	Islandwide	1,2,3,6
102.0	HIGH CAPACITY TRANSIT		
102.1	HART rail technology between Wahiawa and Pearl Highlands Rail Station	Central Oahu	1,3,6
102.2	Light Rail between Wahiawa and Pearl Highlands Rail Station	Central Oahu	6
102.3	Bus Rapid Transit between Wahiawa and Pearl Highlands Rail Station	Central Oahu	1,4,6
102.4	Flyer Stops between Wahiawa and Pearl Highlands Rail Station	Central Oahu	6
102.5	Park and Ride with Flyer Stop in median mauka of Ka Uka Blvd	Central Oahu	7
102.6	HART rail technology between Mililani and Pearl Highlands Rail Station	Central Oahu	8
102.7	Aerial Gondola between Waipio and Wahiawa	Central Oahu	8
102.8	Aerial Gondola between Waipio and Pearl Highlands Rail Station	Central Oahu	8
200 BICYCLE PROJECTS			
201.0	BICYCLE PATHS (Off-street bicycle facility)		
201.1	New Pathway on Waipahu St between Paiwa St and Kamehameha Hwy	Central Oahu Regional Park	1, 3, 4, 6
201.2	New Pathway between Anania Dr and Central Oahu Regional Park	Kipapa Gulch	1, 3, 4, 6
201.3	New Direct Kipapa Gulch Bike Bridge and Pathway	Kipapa Gulch	8
201.4	New Bike Pathway along Kamehameha Hwy. from Ka Uka Boulevard to Waipahu Street	Waipio	7
201.5	New Ped/Bike Path connecting Kamehameha Hwy at Waipahu Street to Leeward Community College Rail Station	Leeward Community College	8
201.6	New Bike Pathway along Kamehameha Hwy. between Wahiawa and Anania Dr	Wahiawa	7
201.7	Bike Pathway on Cane Haul Road between H-2 and Pearl Highlands Rail Station	Pearl Highlands	8
201.8	Bicycle pathway infrastructure through the H-2/Meheula Parkway Interchange	Mililani	8

Table 1. List of Potential Projects (cont.)

Project Number	Project Description	General Location	Source
201.9	Bike pathway along California Ave. between Kilea Pl. and Nonohe St	Wahiawa	8
201.10	Bike Pathway in Central Oahu Regional Park between Kamehameha Hwy and Paiwa St	Mililani	6
202.0	BICYCLE LANES (On-street bicycle facility delineated from vehicle traffic)		
202.1	Bicycle lanes on Ainamakua Dr between Mililani Park and Ride and Kualapa St	Mililani Mauka	1, 3, 4, 6
202.2	Bicycle lanes on Meheula Parkway through Mililani H-2 Interchange	Mililani	1, 2, 3, 4, 6
202.3	Bicycle lanes on Meheula Parkway between Mililani H-2 Interchange and Kapanoe St	Mililani Mauka	1, 2, 3, 4, 6
202.4	Bicycle lanes on Kuahelani Avenue between Hokuahiahi Park and Meheula Parkway	Mililani	1, 3, 4, 6
202.5	Bicycle lanes on Kamehameha Highway between H-1 and H-2	Waiawa Interchange	1, 2, 3, 4, 6
202.6	Bicycle lanes on Kamehameha Highway from Waihona St. connecting to Pearl Harbor Bike Path	Waipio	6
203.0	BICYCLE ROUTES (On-street bicycle facility with street signs and/or sharrows)		
203.1	Bicycle route on California Ave between Plum St and Iliahi Elementary	Wahiawa	1, 6
203.2	Bicycle route on Kunia Rd btwn Anonui St and Wilikina Dr	Schofield to Waikele	6
203.3	Bicycle route on Leilehua Golf Course Rd between Kamehameha Hwy and Wikao St	Waipio Acres	6
203.4	Bicycle route on Kamehameha Highway between Haleiwa Bypass and Kuahelani Ave	Mililani	1, 6
203.5	Bicycle route on Anania Dr between Meheula Pkwy and Kipapa Gulch Path	Mililani	3
203.6	Bicycle route on Lanikuhana Ave from South end of Meheula Pkwy to Mililani Town Center	Mililani	1
203.7	Bicycle route on Kamehameha Hwy between Waipio Uka St and Waipahu St	Waipio	6
300 PEDESTRIAN PROJETS			
301.0	LOCATION-SPECIFIC		
301.1	Crosswalk across makai leg of Kamehameha Hwy and Avocado St intersection	Wahiawa at Olive Ave	3,6
301.2	Shared use path on Kamehameha Hwy between Lanikuhana Ave and Meheula Pkwy	Mililani	8
302.0	GENERAL		
302.1	Safe Routes to School	Islandwide	3
302.2	Pedestrian Crossing Safety	Islandwide	3
302.3	Mobility Hubs	COTS area transit centers	7

Table 1. List of Potential Projects (cont.)

Project Number	Project Description	General Location	Source
303.0	COMPLETE STREETS		
303.1	California Ave between Kamehameha Hwy and Wahiawa District Park	Wahiawa	6
303.2	Kipapa Dr between Hookelewa St and Mililani Waena Elementary School	Mililani	6
303.3	Complete Streets modifications on priority roads	Central Oahu	6
400	ROADWAY PROJECTS		
401.0	KA UKA BLVD. & H-2 INTERCHANGE		
401.1	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (freeway ramp widening & signal modification)	Waipio Interchange	1, 2, 3, 5
401.2	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (freeway ramp approach widening)	Waipio Interchange	1, 2, 3, 5
401.3	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St. (freeway ramp approach widening)	Waipio Interchange	1, 2, 3, 5
401.4	Ka Uka Blvd & H-2 Northbound Off-Ramp to Limuana St (freeway ramp signal modification)	Waipio Interchange	1, 2, 3, 5
401.5	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St (freeway ramp widening & signal modification)	Waipio Interchange	1, 2, 3, 5
401.6	Ka Uka Blvd & H-2 Northbound Off-Ramp to Ka Uka Blvd (freeway ramp relocation & widening)	Waipio Interchange	1, 2, 3, 5
401.7	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	1, 2, 3, 5
401.8	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	1, 2, 3, 5
401.9	Ka Uka Blvd & H-2 Flyover Ramp	Waipio Interchange	8
402.0	KA UKA BOULEVARD		
402.1	Ka Uka Blvd between Moaniani St and Commercial Driveway/Spine Rd (lane addition)	Waipio	5
402.2	Ka Uka Blvd Intersection with Commercial Driveway/Spine Rd (intersection lane & signal modification)	Waipio	5
402.3	Ka Uka Blvd Intersection with Commercial Driveway/Spine Rd (intersection widening & modification)	Waipio	5
402.4	Ka Uka Blvd between H-2 and new development (new road)	Waipio	6
403.0	KAMEHAMEHA HIGHWAY		
403.1	Kamehameha Hwy & Lumiaina St Intersection (intersection widening & signal modification)	Waipio	5

Table 1. List of Potential Projects (cont.)

Project Number	Project Description	General Location	Source
403.2	Kamehameha Hwy & Waipahu St Intersection (intersection restriping & signal modification)	Waipio	5
403.3	Kamehameha Hwy & Ka Uka Blvd Intersection (intersection widening)	Waipio	5
403.4	Kamehameha Hwy between Ka Uka Blvd and North of Ka Uka Blvd. (add NB lane)	Waipio	5
403.5	Kamehameha Hwy between Ka Uka Blvd and Lanikuhana (widen from 3 to 4 lanes)	Waipio to Mililani	1, 2, 3, 4
403.6	Kamehameha Hwy between H-2 and Kilani Ave (unknown)	Wahiawa	6
403.7	Kamehameha Hwy Roosevelt Bridge (rehabilitation)	Kipapa Gulch	6
403.8	Kamehameha Hwy HOV lanes (Ka Uka Boulevard to Farrington Hwy)	Central Oahu	7
404.0	H-2 INTERCHANGES		
404.1	H-2 & Pineapple Road Interchange	New Interchange	1, 3, 5
404.2	H-2 & Meheula Pkwy (widen on-ramp)	Mililani Mauka	6
404.3	H-2 & Kamehameha Hwy (widen on-ramp)	Wahiawa	7
405.0	H-1 & H-2 INTERCHANGE		
405.1	Waiawa H-1/H-2 Interchange Eastbound/Southbound Merge Improvements	Waiawa Interchange	1, 3, 5
406.0	CENTRAL MAUKA ROADS		
406.1	New Road between Mililani Mauka and Pearl City	Central Oahu	4, 6
406.2	New Road between Whitmore Ave (SR 804) and California Ave	Wahiawa	4, 6
406.3	New Road between California Ave and Meheula Pkwy	Wahiawa	4, 6
407.0	PAIWA EXTENSION		
407.1	Extend Paiwa St from north of Lumiauau St to Kamehameha Hwy/Ka Uka Blvd intersection	Central Oahu	6
408.0	MILILANI ACCESS		
408.1	New H-2 Interchange at Mililani Mauka	Mililani Mauka	6
408.2	New road from Wikao St to Park and Ride	Mililani Mauka	8
408.3	New road between H-2 and Park and Ride	Mililani Mauka	8
408.4	New flyer stops at H-2 with pedestrian pathway to Park and Ride	Mililani Mauka	7

Table 1. List of Potential Projects (cont.)

Project Number	Project Description	General Location	Source
500 TRANSPORTATION SYSTEM MANAGEMENT			
501.0 TRANSPORTATION DEMAND MANAGEMENT			
501.1	Free real-time online carpool matching	Central Oahu	3, 4
501.2	Outreach promotion and marketing of alternative transportation	Central Oahu	3, 4
501.3	Emergency ride home program	Central Oahu	3, 4
501.4	Major special events (e.g., Mililani Holiday Parade)	Central Oahu	3, 4
501.5	Employer based commuter/parking programs	Central Oahu	3, 4
501.6	Emerging and innovative strategies - Carsharing	Central Oahu	3, 4
501.7	Emerging and innovative strategies - Bikesharing	Central Oahu	7
501.8	Vanpool program	Central Oahu	3, 4
501.9	Support of working from home	Central Oahu	7
501.10	Support of alternate/shifted work hours	Central Oahu	7
502.0 INTELLIGENT TRANSPORTATION SYSTEMS (ITS)			
502.1	ITS (Real-time traffic info, dynamic signage, adaptive signals, etc.)	Central Oahu	3,4
600 PRICING SOLUTIONS			
601.0 PRICING			
601.1	Congestion pricing/ramp metering on H-1 or H-2	Central Oahu/ Islandwide	7,8
601.2	HOT lanes	Central Oahu	7,8
601.3	Parking strategies	Central Oahu	7

- Sources:*
1. Central Oahu Sustainable Communities Plan 2016
 2. Central Oahu Sustainable Communities Plan 2002
 3. Oahu Regional Transportation Plan 2040
 4. Transportation for Oahu Plan 2025
 5. Koa Ridge Traffic Impact Analysis Report
 6. Other Study
 7. Added by Project Team
 8. Added by Public

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2.0 INITIAL PROJECT EVALUATIONS

Each project in **Table 1** was initially evaluated. These measures required a wide cross-section of parameters because of the range of multi-modal projects that were identified from past planning and engineering studies. These studies were reviewed by the project consultants and added to current and planned infrastructure projects, as well as input from the community. The projects under consideration include:

- **100:** Transit Projects
- **200:** Bicycle Projects
- **300:** Pedestrian Projects
- **400:** Roadway Projects
- **500:** Transportation Demand Management and Intelligent Transportation System Projects
- **600:** Pricing Projects

Measures used to conduct this initial evaluation include both quantitative and qualitative measures.

The following Appendices are included in this report to support the evaluation:

- **Appendix A:** Detailed evaluations of projects using quantifiable data and the applicable scoring criteria
- **Appendix B:** State of Hawaii Roosevelt Bridge Inspection Report
- **Appendix C:** Results of the OahuMPO Travel Demand Model

During this stage of analysis, the objective was to be systematic to make an initial ranking of individual projects that could enhance travel within the COTS area. The major measures included:

- Anticipated improvements to traffic operating conditions and/or benefit to travel time
- Contribution to expanding the active transportation network
- Impact on better balancing the travel mode split for commute trips.

This analysis helped to provide an understanding of each project's purpose, description, and potential benefits. A summary for each potential improvement is presented below, followed by a recommendation on whether to include it in the study going forward.

2.1 Transit Projects

2.1.1 General Transit

Project 101.1: Bus Service Expansion

Purpose: To increase the attractiveness of transit travel through increased convenience, as well as reduced wait and travel times.

Project Description: Routes 50 and D, both new, are designed to serve the heart of Central Oahu with all-day, every-day two-directional operations. Frequencies will be enhanced in the COTS Bus Service Expansion project.

Route 50 is designed to connect transit centers in Central Oahu. The COTS Baseline Transit Alternative has Route 50 operating as a local route only. The COTS Bus Service Expansion would feature limited stop service on Route 50 (Route 50L) comparable to what is currently offered on Routes 1 (Route 1L) and 2 (Route 2L). Service will be every 15 minutes in both directions in the peak period to the Waipahu Transit Center and Rail Station.

Route D is a Country Express route similar to the existing Routes C and E. These routes provide seven-day, all-day, limited-stop service. The alignment of this proposed route has varied slightly over the past ten years, but it has always connected transit centers in Wahiawa and Mililani with the Pearl Highlands rail station. Route D serves Koa Ridge via the new H-2 Pineapple Road interchange (COTS Project 404.1) in the COTS Baseline Transit Alternative. Without flyer stops, this route would continue through Koa Ridge providing 15-minute service and access to the Pearl Highlands Station via the direct H-2 ramp. Route 51 serving Wahiawa through Mililani to Pearl Ridge via Kamehameha Highway would add trips in the peak periods providing 10-minute service.

Expanded service would add approximately 42 bus service hours to the COTS area with an approximate increase of 2,400 passenger boardings.

Evaluation: Future bus service included in the OahuMPO travel demand model was assumed to be expanded on the higher ridership routes to provide better service and further increase transit demand. These routes are primarily those that connect to the future Pearl Highlands and Waipahu rail stations, but also those that provide access to the major retail, service, and employment centers in Kapolei, Pearl City/Aiea, and downtown Honolulu. While expanded bus service will be beneficial to providing a viable option for Central Oahu residents and employees, this service has limitations in that headways and reliability are directly affected by traffic. As congestion worsens on the major roadways (e.g., H-2, Kamehameha Highway, and to a much lesser extent, Kunia Road), regional bus service to and from the area to points makai will be slowed unless separate guideways are available. An increase in bus service would benefit from the construction of freeway flyer stops at Mililani Mauka and on H-2 mauka of Ka Uka Boulevard in conjunction with the H-2 park-and-ride lot.

Recommended for Further Evaluation: Yes

Project 101.2: Construct Transit Centers

Purpose: To provide centralized locations with a range of transit service and convenient and safe access and connections to other modes, including biking, walking, transportation network company vehicles, taxis, and private automobiles.

Project Description: New centers to be constructed include the Pearl Highlands rail station and Koa Ridge transit center.

Evaluation: Expanded facilities should be provided at the existing Mililani Transit Center. These facilities make transit (both bus and rail) more attractive to commuters and off-peak travelers, as well as more efficient for transit operators, by centralizing transportation options and consolidating and/or connecting bus and rail routes. In addition to the centers themselves (with bike parking and other amenities), connections to and from those facilities will be needed to make them accessible to and effective for all modes. Those connections would be provided by other active transportation projects included in this study. Additional facilities include the Koa Ridge/H-2 median park-and-ride lot (Project 102.5) and bus flyer stops (Project 102.4) that improve system performance.

Recommended for Further Evaluation: Yes

Project 101.3 City Operations and Maintenance of Bus Stop/Shelter Conditions and Pedestrian and Bicycle Facilities

Purpose: Originally pulled from previous OahuMPO studies, the intent of including this project was to provide on-going operations and maintenance primarily for transit facilities (including enhanced bus stop amenities and appearance), but also for active modes and roadways.

Project Description: This on-going activity is a critical element of the long-term viability of all travel modes provided by the City & County of Honolulu Department of Transportation Services (DTS), but it is not a specific project that can be easily addressed and readily included in an implementation for the COTS region. However, a detailed inventory of pedestrian facilities and bus stops in the COTS area was compiled to identify the current state of existing facilities.

In addition to expanded bus service within the COTS area included in Project 101.1, transit patronage is directly affected by the convenience, attractiveness, and safety of bus stops.

Evaluation: A detailed survey was conducted at the 265 existing bus stops in the COTS area to determine the available amenities, as well as the 78 shelters to determine the overall condition. Details of the survey are presented in Appendix D of Deliverable C. Key findings included the following for all bus stops:

- 4% (11 stops) were missing signs
- Only 30% (78 stops) included shelters
- Nearly 40% (105 stops) had benches, but only 4 additional stops had a stool for seating one person
- Just over 30% (80 stops) had trash cans
- Only 3% (8 stops) included a posted schedule

Of the 78 stops with shelters:

- Nearly 71% (63 stops) were rated very clean (42%) or average cleanliness (39%)
- Just over 96% (75 stops) were rated in good repair (45%) or average repair (51%)
- Trash was prevalent at nearly 58% (41 stops) of the 78 shelter stops

Potential improvements to stops include providing at least a single seat at every stop, ensuring that all stops have the proper signage, increasing the number of trash cans and regular collection, and increasing the number of shelters at exposed stops with no nearby shade.

In addition to bus stops, a survey of selected pedestrian and bicycle facilities throughout the COTS area was conducted to evaluate the condition of these facilities and to identify any potential maintenance or operational issues. The methodology for collecting this data and the results are included in Appendix C of Deliverable C.

In general, the condition of pedestrian surveyed facilities in each community was fair to good. While wider sidewalks (wider than the 4-foot minimum) and limiting the number of obstructions (e.g., street lights, bus shelters, etc.) are desirable, none of the surveyed areas showed a need for immediate repairs. Several surveyed intersections included channelized right-turn lanes with raised median islands that provide an area for pedestrian staging. While this design helps to facilitate vehicle capacity and reduce driver delays, it generally promotes faster turning movements, reduces safety, and creates a less attractive pedestrian environment. Attractive and convenient facilities that help to enhance safety are needed to increase the demand for non-auto modes and are critical to help achieving reduced dependence on single occupant vehicle trips.

For the surveyed bicycle facilities, most were in good condition from a maintenance perspective. However, the design of some facilities could be improved as part of future maintenance activities, including repaving and re-striping. For example, bicycle lanes on roadways adjacent to a vertical curb should be a minimum of 4 feet wide without a gutter and 5 feet wide with a gutter (with a 5-foot desired width wherever possible). In addition, the seam between the pavement and gutter should be smooth to reduce the potential for a bicyclist to lose control. Next to parallel parked vehicles, lanes should be a minimum of 6 feet wide so that cyclists can avoid getting “doored” by a driver. In some cases, the surveyed

bike lanes were less than the desired minimums. Adjacent vehicle lanes can be reduced to 10 feet in width (although 11 feet is desired for lanes with frequent bus transit service.

Recommended for Further Evaluation: Yes.

Project 101.4 Human Services Transportation Coordination

Purpose: Originally pulled from previous OahuMPO studies, the intent of including this project was to acknowledge on-going human services transportation.

Project Description: Similar to Project 101.3, this on-going activity is a critical element of the long-term viability for travelers requiring assistance or accessible transportation provided by the City & County of Honolulu Department of Transportation Services (DTS).

Evaluation: This project is not a specific project that can be easily addressed and readily included in an implementation program specifically for the COTS region.

Recommended for Further Evaluation: No.

2.1.2 High Capacity Transit

Project 102.1: HART Rail Technology from Wahiawa to Pearl Highlands Rail Station

Purpose: To provide high-quality transit service on an elevated/grade-separated fixed guideway through the entire COTS area that provides a direct connection to the future rail system currently under construction.

Project Description: The rail extension assumes four stations located mauka of the planned Pearl Highlands rail station. These stations would be located in the H-2 median adjacent to Waipio, Koa Ridge, Mililani Mauka, and the terminus in Wahiawa. Access to stations at Waipio, Koa Ridge, and Mililani/Mililani Mauka would require bridges crossing H-2. Further analysis would include if these access bridges should be pedestrian/bike only or accommodate vehicles.

The station located by Koa Ridge would incorporate a park-and-ride facility in the H-2 median with vehicle/bus access from the left lanes in both directions. The terminus station could be located south of Wahiawa at the Wahiawa park-and-ride lot on Leilehua Road. This would avoid the disruption of constructing an elevated structure on a very congested Kamehameha Highway in Wahiawa. This option would help alleviate some of the congestion at the H-2 off-ramp to Kamehameha Highway merge by encouraging more people to take the bus to the rail station. A station in the heart of Wahiawa, perhaps at California, could reduce congestion further. However, the impact of an elevated line through the narrow Kamehameha Highway corridor may add to congestion, thereby negating the benefit of a station in the heart of Wahiawa.

Evaluation: This grade-separated rail system could reduce travel times by seven (7) to nine (9) minutes to key regional destinations on Oahu. The travel time savings to destinations Diamond Head of Pearl Highlands assumes no transfer is needed as the rail would be integrated into the system. It is assumed destinations Ewa bound would require a transfer.

An extension to California Avenue and Kamehameha Highway would add 44 hours of rail service hours based upon 10-minute peak and 15-minute off-peak service. The added hours of rail service would be slightly less with a terminus south of Wahiawa and at the park and ride lot. Further analyses will show that this addition of service hours will be off-set with a decrease in bus service hours and a corresponding decrease in bus operational costs. This decrease in bus service hours is due to the majority of Central Oahu connecting bus to rail service accessing rail stations prior to Pearl Highlands. All routes that terminate at

the Pearl Highlands Station would be truncated at the Koa Ridge Station. If further review suggests this combination of bus and rail connecting the Koa Ridge Flyer Stop and Station is cost effective and desirable it could be considered as a mitigation to the high cost now estimated at the Pearl Highlands Transit Center, H-2 ramp, and parking facility.

An extension of the HART rail technology to Wahiawa would add approximately 4,500 passengers to the rail system based upon initial review. More detailed alternative analysis studies could show that future ridership will not warrant extension of a HART-style train all the way to Wahiawa, given the fact that planned growth is expected to occur closer to Mililani Town (e.g., Koa Ridge and Waiawa developments). However, increased congestion in the H-2 freeway and Kamehameha Highway corridors may warrant further evaluation of fixed rail in the COTS region. The benefit of using the same technology is that some trains could continue using the same track and may not require a transfer at the Pearl Highlands station. The ultimate deciding factor will be the benefit cost analysis in any alternatives analysis. Other technologies and/or more flexible and less expensive bus service connections may negate the feasibility of this project.

Recommended for Further Evaluation: Yes.

Project 102.2: Light Rail Technology from Wahiawa to H-1 (Leeward Community College Station)

Purpose: To provide higher-quality transit service on an at-grade fixed guideway through the entire COTS area that provides a direct connection to the future rail system currently under construction.

Project Description: This project would be an at-grade rail system could reduce travel times to key regional destinations on Oahu about eight (8) minutes. The Light Rail Technology variation alignment shown in **Figure 2** is 7.1 miles in length and is on an elevated structure in three sections that are shown in red. The remainder of the alignment is in blue with classic light rail at-grade operations.

Many of the bus routes that terminate at the Pearl Highlands Station Transit Center will be continued unless it is determined that buses should directly serve this project's stations. It may prove beneficial to test this project together with the HART Rail Technology variation to the H-2 Koa Ridge Park and Ride lot. Appropriate routes would be truncated at the Koa Ridge Flyer Stop in a combined scenario.

Evaluation: Combining the HART Rail Technology variation with this Light Rail Technology variation is possible because they complement each other. The amount of passenger demand might overwhelm a light rail alignment if it were to be extended to Wahiawa. However, an alternate route or segment could continue on Kamehameha Highway to the Wahiawa Park and Ride lot, terminating just south of Wahiawa. Wahiawa demand would be efficiently accommodated with a connection between all Central bus routes and the HART rail technology at the Koa Ridge Flyer Stop. Conversely, it would likely not be cost effective to extend the HART Rail Technology variation to Mililani and Wahiawa due to high cost. Light Rail offers Waipio, Koa Ridge, Mililani, and Mililani Mauka excellent access via the 15 proposed stations provided in **Table 2**.

The complementary aspect of these two rail variations is achieved because of the ability to terminate the light rail line at the Leeward Community College (LCC) station. This allows the light rail line to not interfere with the HART Rail Technology Pearl Highlands to Koa Ridge Flyer Stop branch. The stations proposed for this alignment are mostly at grade and low cost.

Figure 2. Light Rail Transit Alignment to Mililani Mauka

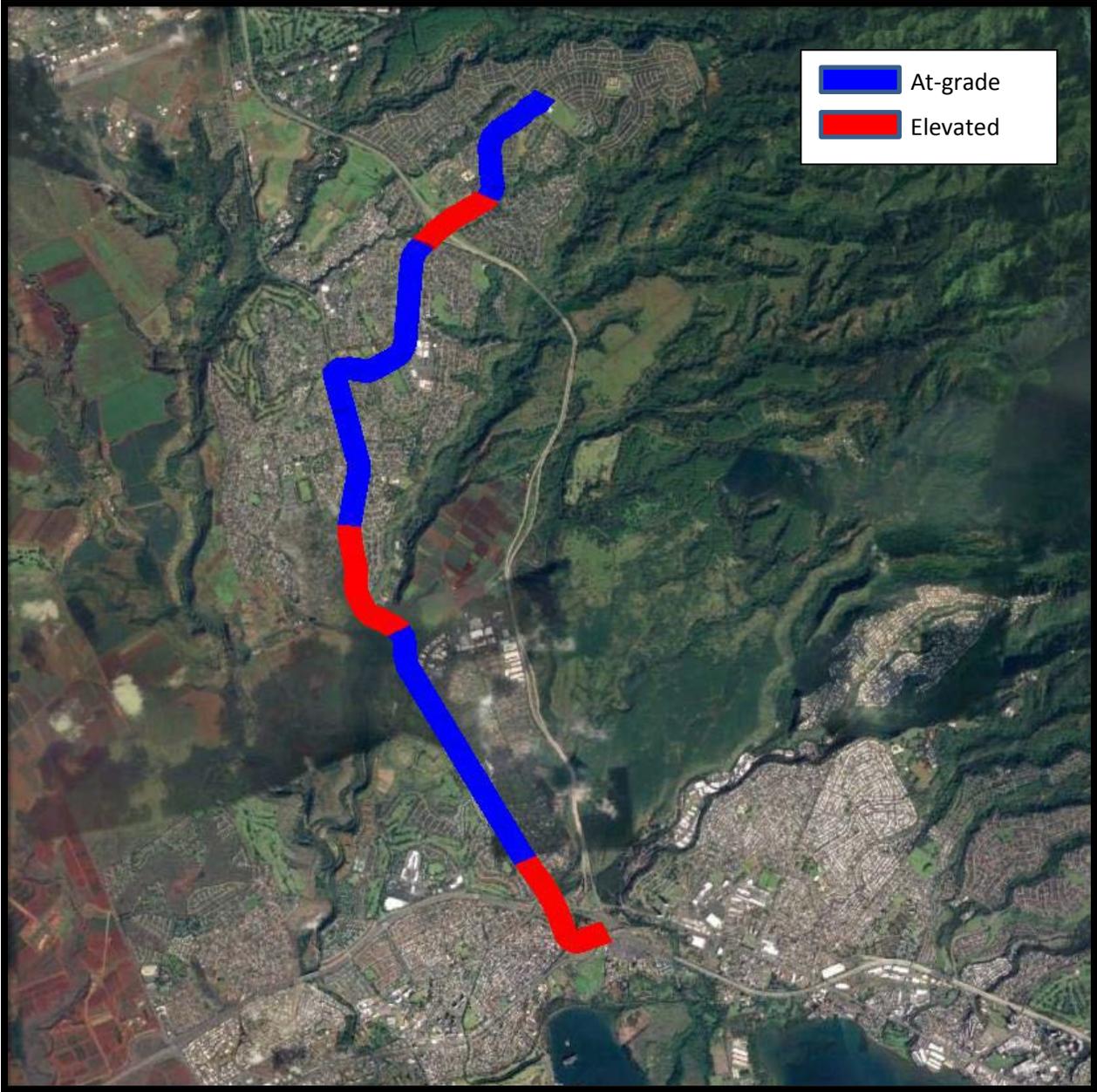


Table 2. Suggested Light Rail Station Locations in Project 102.2

Number	Name	Access and Other Features	Number of tracks served
1	Leeward Community College	At grade station Connects to existing rail at Leeward Community College via pedestrian overpass between stations over Kamehameha Highway and H-1 ramps	2
2	Waipahu Street	At grade station connects to Waipahu Street via pedestrian overpass between station and end of existing street over Kamehameha Highway and H-1 ramps.	2
3	Lumiauau Street	At grade station in the middle of Kamehameha Highway.	2
4	Luminaina Street	At grade station in the middle of Kamehameha Highway.	2
5	Waipio Uka Street	At grade station on the Diamond Head side of Kamehameha Highway along existing greenway.	2
6	Ka Uka Boulevard	At grade station on the Diamond Head side of Kamehameha Highway along existing greenway.	2
7	Koa Ridge	At grade station on the Diamond Head side of Kamehameha Highway along existing greenway. Uses future pedestrian and bike connection to new development for both access to rail and to shared use pathway aside elevated rail structure over Kipapa Gulch.	2
8	Anania Drive at end by Akaku Street	At grade station on the Diamond Head side of Kamehameha Highway along existing greenway. Uses existing elevated pedestrian overpass across Kamehameha Highway to provide safe access from existing residential communities on both sides of roadway to rail and to a shared use pathway aside elevated rail structure over Kipapa Gulch.	2
9	Lanikuhana Avenue	At grade station on the Diamond Head side of Kamehameha Highway along existing greenway.	2
10	Meheula Parkway	At grade station on the mauka side of Meheula Parkway next to Post Office.	2
11	Mililani Transit Center	At grade station on the mauka side of Meheula Parkway next to Mililani High School with new staggered mid-block crosswalk with HAWK signal to Transit Center.	2

Table 2. Suggested Light Rail Station Locations in Project 102.2 (cont.)

Number	Name	Access and Other Features	Number of tracks served
12	Kuahelani Avenue	At grade station on the mauka side of Meheula Parkway next to park.	2
13	H-2 Meheula Flyer Stop	Elevated station provides allows for transfers between light rail and many peak period express buses using Flyer Stop. Provides access from Mililani Mauka Park and Ride lot via elevated pedestrian and bicycle connection as shown in Figure 5.	2
14	Makaiki Street	At grade station on the makai side of Meheula Parkway next to park.	1
15	Lehiwa Drive	At grade station on vacant land within compatible land use in area next to Castle & Cooke Self Storage facility. Ample space for storage and staging of peak period trains.	1

Additional future stations could be added at a lower cost as compared to Project 102.1. One major consideration of at-grade light rail technology is the potential negative effects on vehicle travel as trains reduce available green time at signalized intersections or cause additional delays because of signal preemption (i.e., to expedite train travel). This project adds about 60 hours of transit service serving approximately 6,200 passengers based upon initial estimates. The added hours of service will be off-set with a decrease in bus service hours due to duplication and truncating at rail stations. If a spur is added to Wahiawa then the added hours of service and ridership estimates will increase. More detailed alternative analysis studies could show that future ridership will not warrant extension of a light rail system all the way to Wahiawa given the fact that planned growth is expected to occur closer to Mililani Town (e.g., Koa Ridge and Waiawa developments). However, increased congestion in the H-2 freeway and Kamehameha Highway corridors may warrant further evaluation of fixed rail in the COTS region. The ultimate deciding factor will be the benefit-cost analysis in any alternatives analysis. Other technologies and/or more flexible and less expensive bus service connections may negate the feasibility of this project.

Recommended for Further Evaluation: Yes.

Project 102.3: Bus Rapid Transit (BRT) Service from Wahiawa to Pearl Highlands Rail Station

Purpose: To provide higher-quality bus transit service with some dedicated lanes through the entire COTS area that provides a direct connection to the future rail system currently under construction.

Project Description: Bus routes would be redesigned to operate as BRT services. Approximately 20 hours of additional bus service would be added to take advantage of BRT treatments in the peak periods; however, local routes that serve each stop would need to remain in service for passenger convenience and service area coverage. This service would serve approximately 2,050 passengers. BRT treatments would be dependent upon freeway flyer stops and associated pedestrian connections to maintain bus speed.

Evaluation: Bus rapid transit (BRT) is most effective when it is able to operate in dedicated travel lanes and/or separate facilities from mixed-flow traffic. Given the current roadway system, the most viable corridor is the H-2 freeway, but it has limited access to the highest population densities within the study area. With BRT, travel times could only be truly competitive where separated operating facilities are provided. This could reduce travel times to key regional destinations on Oahu by six (6) to eight (8) minutes.

Alternative analysis studies could show that BRT service is the most cost-effective means of providing improved transit capacity within the H-2 freeway and/or Kamehameha Highway corridors assuming that vehicular delays accessing the rail station are minimized.

Recommended for Further Evaluation: Yes

Project 102.4: Flyer Stops between Wahiawa and H-1

Purpose: To allow transit patrons direct access to express or limited stop routes that use higher capacity and speed facilities, including the H-2 freeway and Kamehameha Highway.

Project Description: Flyer stops include direct ramps to and from the freeway or highway that allow intending passengers to access the bus without the bus having to leave the freeway right-of-way. This saves bus operations time in that the vehicle does not have to mix in congested arterial or street traffic to access passengers and then return to the freeway. Passengers on-board the bus are not inconvenienced with out of direction travel to pick up additional passengers.

Evaluation: This project is similar to Projects 102.5 and 408.4 that are both recommended for further evaluation. Because there are no additional locations where flyer stops would be feasible, this project is not recommended for further study.

Recommended for Further Evaluation: No

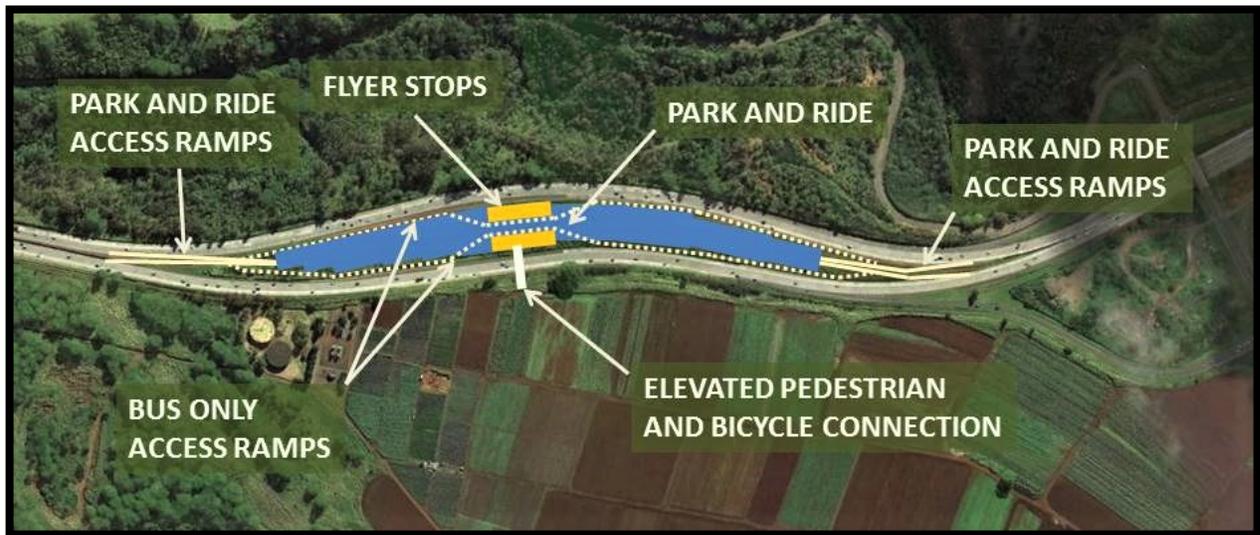
Project 102.5: Park & Ride with Flyer Stop in H-2 median mauka of Ka Uka Boulevard

Purpose: To provide direct access to bus transit routes on the H-2 freeway by utilizing available right-of-way in the freeway median.

Project Description: A Park and Ride facility could be constructed in the freeway median, and it would require a bridge from the Ewa side of the freeway to allow private vehicles and buses to access the lot. The bridge could also include adequate width for bicycle and pedestrian facilities (ideally a separate shared use path).

Figure 3 shows the connecting elevated bridge for pedestrian and bicycles; however, a larger bridge would allow vehicles and buses to enter the facility directly from Koa Ridge. Ramps to and from the left lane of the freeway would need to be provided in each direction and would be for bus use only. The stops would be in close proximity to the new Koa Ridge development and would provide a convenient alternative to driving alone or carpooling.

Figure 3. Conceptual Layout of H-2 Park and Ride



Evaluation: If further review suggests this combination of bus and park and ride lot capacity at the Koa Ridge Flyer Stop is cost effective and desirable, it could be considered either in addition to or as a replacement for the Pearl Highlands parking facility. The Koa Ridge Flyer Stop and Park and Ride Facility can be designed with a parking structure of about 200,000 square feet per level above the first level. The first level will have significantly reduced space for parking because of the need for ramps and the flyer stops, but the upper levels can be designed as standard parking decks. This would allow for about 625 stalls per level. If the overall facility were to be built similar to most large structured transit park and rides it would have four levels above the first level. This will provide for a facility of 2,500 stalls. The park and ride lot together with the direct access ramp to Koa Ridge will add approximately 3,100 passengers to the system. Services would be redesigned to serve the lot adding about 14 bus service hours.

The H-2 access and transit center would be needed for buses to access the rail station with the thousands of bus passengers. However, the foundation would not need to be as extensive if the parking levels were not needed. The H-2 Koa Ridge park and ride facility would likely have much less foundation cost, greater deck area parking capacity, and the ability to have more parking decks than what is estimated for Pearl Highlands.

Recommended for Further Evaluation: Yes.

Project 102.6: HART Rail Technology from Mililani to Pearl Highlands Rail Station

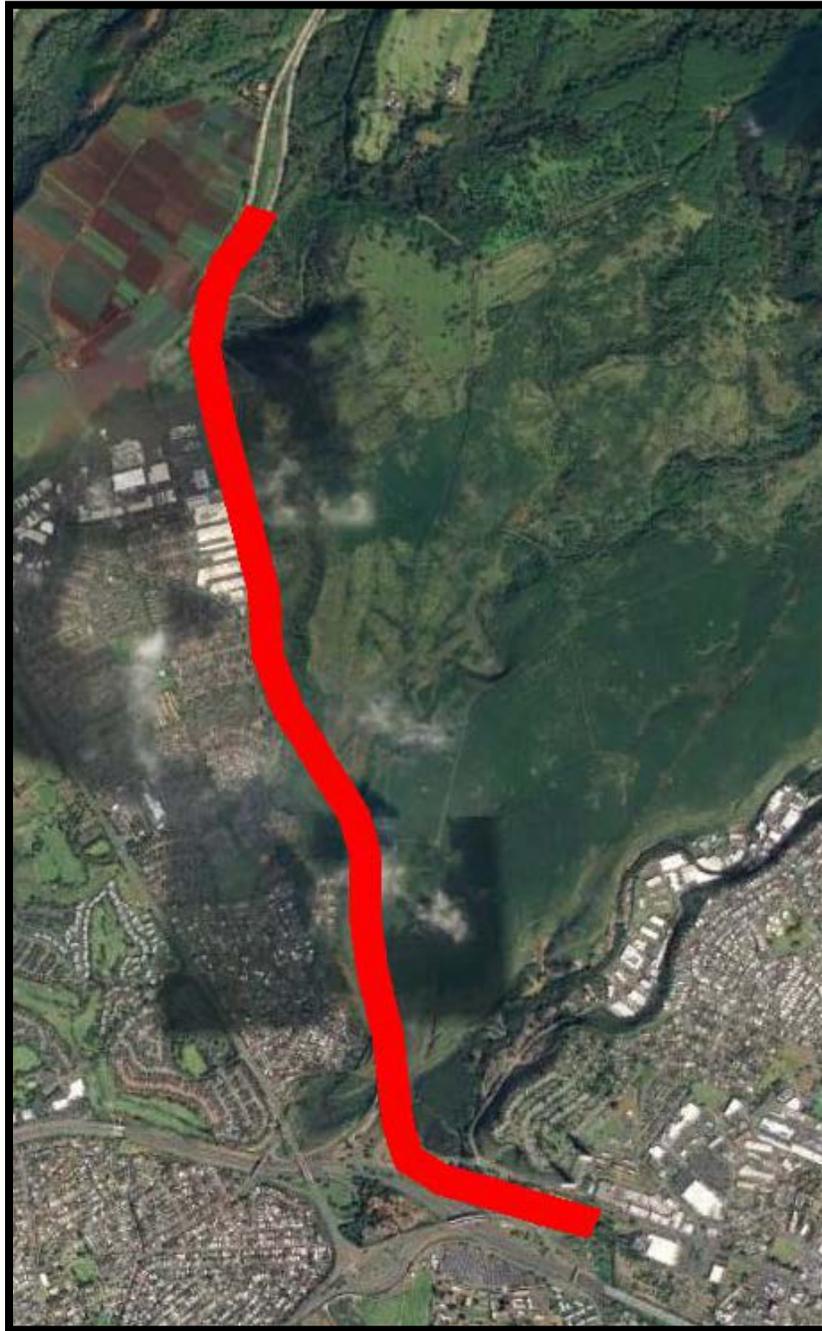
Purpose: To provide high-quality transit service on an elevated/grade-separated fixed guideway from the center of the COTS area to the future rail system currently under construction.

Project Description: The rail extension assumes three stations located mauka of the planned Pearl Highlands rail station. These stations would be located in the H-2 median adjacent to Waipio, Koa Ridge and Mililani/Mililani Mauka, although stations could be located on the Diamond Head side of H-2. Access to stations at Waipio, Koa Ridge, and Mililani/Mililani Mauka would require bridges crossing H-2. Further analysis would include if these access bridges should be pedestrian/bike only or accommodate vehicles. The station located by Koa Ridge would incorporate a park-and-ride facility in the H-2 median with

vehicle/bus access from the left lanes in both directions. **Figure 4** shows an alternative alignment terminating in the H-2 median adjacent to Koa Ridge.

The HART Rail Technology variation alignment shown in Figure 4 is 17,500 feet in length and is an elevated structure. This variation uses all of the bus routes and services included in the COTS High Capacity Transit Using Bus Only Alternative with the exception that bus routes terminating at the Pearl Highlands Transit Center would be truncated at the Koa Ridge Station.

Figure 4. HART Rail Technology Terminating Alignment to Koa Ridge



Evaluation: This grade-separated rail system could reduce travel times by seven (7) to nine (9) minutes to key regional destinations on Oahu. The travel time savings to destinations Diamond Head of Pearl Highlands assumes no transfer is needed as the rail would be integrated into the system. It is assumed destinations Ewa bound would require a transfer. An extension to Mililani/Mililani Mauka would add 30 hours of rail service hours based upon 10-minute peak and 15-minute off-peak service. Further analyses will show that this addition of service hours will be off-set with a decrease in bus service hours and a corresponding decrease in bus operational costs. This decrease in bus service hours is due to the majority of Central Oahu connecting bus to rail service accessing rail stations prior to Pearl Highlands. All routes that terminate at the Pearl Highlands Station would be truncated at the Koa Ridge Station. If further review suggests this combination of bus and rail connecting the Koa Ridge Flyer Stop and Station along with the park-and-ride facility and access ramps identified in Project 102.5 is cost effective and desirable, it could be considered as a mitigation to the high cost now estimated at the Pearl Highlands Transit Center, H-2 ramp and parking facility.

An extension of the HART rail technology to Mililani/Mililani Mauka would add approximately 3,250 passengers to the rail system based upon initial review. The benefit of using the same technology is that some trains could continue using the same track and may not require a transfer at the Pearl Highlands station. The ultimate deciding factor will be the benefit cost analysis in any alternatives analysis, and other technologies and/or more flexible and less expensive bus service connections may negate the feasibility of this project.

Recommended for Further Evaluation: Yes

Project 102.7: Aerial Gondola between Waipio and Wahiawa

Purpose: To provide higher capacity transit service on an elevated/grade-separated fixed guideway across the majority of the COTS area to increase travel reliability.

Project Description: This grade-separated aerial lift uses a stable three cable system. Cars are able to make stops independently of one another by letting go of the haul cable. Each car can carry up to 35 passengers and cars are spaced about 20 seconds apart. Travel speed is approximately 19 miles per hour. This project would provide service between Waipio and Wahiawa.

Evaluation: Aerial gondola technology has not been implemented in Hawaii but has been successfully used in a variety of environments in the US and abroad. The lower cost of implementation, reduced construction complexity, and separation from traffic flows make this technology a viable option to be considered in an area where terrain and grades make the use of rail technology much more challenging. While this system is considered viable for this alignment, it is anticipated that the demand for such a system may not support the technology to Wahiawa from a benefit-cost perspective. In addition, stopping the service before it reaches the future Pearl Highlands rail station would significantly reduce ridership potential. As such, it was not recommended for further study. However, Project 102.8 has reasonable effectiveness.

Recommended for Further Evaluation: No.

Project 102.8: Aerial Gondola between Mililani Park & Ride and Pearl Highlands Transit Station

Purpose: To provide higher capacity transit service on an elevated/grade-separated fixed guideway from the center of the COTS area to the rail system that is currently under construction.

Project Description: This project is similar to Project 102.7 in that it would provide aerial gondola service to the COTS area. However, this project would provide service between the Pearl Highlands Transit Station and the Mililani Park-and-Ride. An example of an aerial gondola is shown in **Figure 5**.

Figure 5. Example of Aerial Gondola Car



Source: Honolulu Aerial, 2016 (www.honoluluair.com)

Evaluation: Aerial gondola technology has not been implemented in Hawaii but has been successfully used in a variety of environments in the US and abroad. The lower cost of implementation, reduced construction complexity, and separation from traffic flows make this technology a viable option to be considered in an area where terrain and grades make the use of rail technology much more challenging. This type of system operates at approximately 11 miles per hour, includes cars with capacity for 8 to 12 persons, and has a system capacity of 800 to 3000 passengers per hour depending on a variety of operational factors. This alignment is expected to include a terminus at the Mililani Park & Ride lot near the H-2/Meheula Parkway interchange, with stops at the Mililani Transit Center, in Koa Ridge near Kipapa Gulch, and in Waipio before connecting to the rail station, for a total length of 5.25 miles.

The travel time would be a consistent 30 minutes from end to end regardless of traffic on H-2, while vehicle and bus travel times to the rail station from the park and ride facility are expected to be comparable or more as congestion increases on H-1 and H-2. The benefit of the gondola is that it would include stations closer to the population centers in each community (vs bus service along the H-2 corridor) and would require less travel time between the stations and residents' homes or employees place of work.

To the major destinations of Leeward Community College, Kapolei, Downtown Honolulu, and University of Hawaii Manoa campus, the transit travel times would be reduced by 7 to 13 minutes each.

Recommended for Further Evaluation: Yes

2.2 Bicycle Projects

2.2.1 Bicycle Paths

Project 201.1: New Bicycle Pathway on Waipahu Street between Paiwa St and Kamehameha Hwy

Purpose: To provide a dedicated shared use path from central Waipahu to the southern edge of the COTS area that will enhance active mode connectivity and safety.

Project Description: This project would include construction of a shared use path on Waipahu Street in Waipahu. The path would be approximately 1.0 mile long.

Evaluation: Separate bicycle facilities are limited in the southern portion of the COTS area, especially in terms of active mode connections to the adjacent Waipahu community via Kamehameha Highway. Adequate right-of-way appears to be available to provide a shared use path for most of the length of the proposed improvement. This would help to contribute to expanding the bicycle and pedestrian network by roughly 1 mile.

Recommended for Further Evaluation: Yes

Project 201.2: New Pathway between Anania Dr and Central Oahu Regional Park

Purpose: To provide a dedicated shared use path from central Mililani to a major regional destination where a connection does not currently exist.

Project Description: This new path could initially follow the existing Plantation Road alignment until it was integrated into the new Koa Ridge community and would connect link Central Oahu Regional Park to Mililani without requiring visitors to use a private automobile.

Evaluation: Separate bicycle facilities are limited throughout the COTS area, and no dedicated bicycle and pedestrian connections connecting the Mililani and Waipio communities. This would help to contribute to expanding the bicycle and pedestrian network by roughly 2.4 miles depending on the final route.

Recommended for Further Evaluation: Yes

Project 201.3: New Direct Kipapa Gulch Bike Bridge and Pathway

Purpose: To provide a dedicated shared use path from central Mililani to a major regional destination where a connection does not currently exist.

Project Description: This project is essentially the same as Project 201.2 and, therefore, can be eliminated from further consideration.

Evaluation: This project is essentially the same as Project 201.2 and, therefore, can be eliminated from further consideration.

Recommended for Further Evaluation: No.

Project 201.4: New Pathway along Kamehameha Highway from Ka Uka Blvd to Waipahu St

Purpose: To provide a dedicated shared use path from the Waipio community to the adjacent community of Waipahu that will enhance active mode connectivity and safety and allow for an alternative to commuting by private automobile.

Project Description: This new path could be incorporated into the Central Oahu Regional Park and would likely be best suited along the Ewa side of the highway.

Evaluation: Separate bicycle facilities are limited throughout the COTS area, and no dedicated bicycle and pedestrian connections currently connect the Waipahu and Waipio communities near Kamehameha Highway. This new path could be incorporated into the Central Oahu Regional Park and would likely be best suited along the Ewa side of the highway. This would help to contribute to expanding the bicycle and pedestrian network by roughly 1.6 miles depending on the final routing. This project should be combined with Project 201.1 to complete the regional bike network in this area.

Recommended for Further Evaluation: Yes

Project 201.5: New Pathway connecting Kamehameha Highway at Waipahu Street to Leeward Community College

Purpose: To provide a dedicated shared use path from the Waipio and Waikele communities to LCC and the future rail system.

Project Description: The alignment for this path could include the Cane Haul Road alignment that begins opposite Kaupu Place and wraps around the Diamond Head end of Waipahu. In any case, a bridge over Farrington Highway would be needed to connect to the LCC rail station and the adjacent college campus.

Evaluation: No safe and convenient active mode connection is currently available between communities on the mauka side of the H-1 freeway to Leeward Community College. This project would help to contribute to expanding the bicycle and pedestrian network by roughly 1 mile depending on the final routing. This project should be combined with Project 201.1 and 201.4 to complete the regional bike network in this area.

Recommended for Further Evaluation: Yes

Project 201.6: New Pathway on Kamehameha Highway between Wahiawa and Anania Dr in Mililani

Purpose: To provide a dedicated shared use path between the communities of Wahiawa and Mililani where one does not currently exist.

Project Description: The path should ideally begin at the Kamehameha Highway/Avocado Street intersection and extend Makai to Meheula Parkway and Anania Drive. The alignment for this path may have to alternate sides of the highway depending on terrain and available right-of-way.

Evaluation: No safe and convenient active mode connection is currently available between Wahiawa and Mililani. This project would help to contribute to expanding the bicycle and pedestrian network by roughly 3.4 miles. A new facility along this alignment would provide a recreational and commute opportunity for residents in both communities, as well as those residents and employees on Wheeler Air Force Base and along Kahelu Avenue and Wikao Street on the east side of the H-2 freeway. This project should be combined with Projects 201.2, 201.4, and 201.5 to provide a continuous connection between Wahiawa and Leeward Community College (similar to the Pearl Harbor Historic Path that provides regional active mode connectivity).

Recommended for Further Evaluation: Yes

Project 201.7: New Pathway on Cane Haul Road between H-2 and Pearl Highlands Rail Station

Purpose: To provide a dedicated shared use path between the Waipio community and the new rail station.

Project Description: This project would include approximately 1.0 mile of shared use path between H-2 and the Pearl Highlands Rail Station.

Evaluation: No safe and convenient active mode connection is currently available between Waipio and Pearl City. While this project would not complete a link to Pearl City, it would provide a commute and recreational opportunity for residents in Waipio to access the new rail station. The alignment would need to be refined based on topographic constraints (including creek crossings) and it may require use of a portion of Waihona Street to complete the path. The advantage of this project over Project 201.6 is that it will not likely require a bridge over a roadway like the H-1 freeway, but could include other structures to cross small gulches or creeks. This project would help to contribute to expanding the bicycle and pedestrian network by nearly 2.5 miles of facilities. This project should be combined with Projects 201.4 and 202.6 to extend the connection to all of the Waipio community and link it to the Pearl Harbor Historic Trail.

Recommended for Further Evaluation: Yes

Project 201.8: Bike Pathway through the H-2/Meheula Parkway Interchange

Purpose: To provide a separate bike facility on Meheula Parkway across the H-2 interchange to minimize potential vehicle-bicycle conflicts and better connect Mililani Mauka with central Mililani.

Project Description: The proposed path could be installed on the mauka or makai side of the Parkway and would require additional improvements including: possibly cantilevering a structure from the existing parkway overcrossing, modifying the ramp crossings to include additional traffic control devices (e.g., rectangular rapid flashing beacons), and modifying the ramp design to create nearly right-angle turns to slow vehicle speeds and improve visibility of cyclists. Ultimately, this would be a shared use path to minimize right-of-way requirements.

Evaluation: Currently, bicyclists must share the roadway with vehicles or ride on the sidewalk on Meheula Parkway between Ainamakua Drive and Kuahelani Avenue. The sidewalk is relatively narrow at 4 feet and results in conflicts with pedestrians already using this facility. However, implementation of such a facility would enhance safety and encourage bicycling in lieu of automobile travel. This facility would add up to 0.8 miles of new bicycle and pedestrian facilities.

Recommended for Further Evaluation: Yes

Project 201.9: Bike Pathway on California Avenue between Kilea Pl. and Nohohe St.

Purpose: To provide a separate bike facility on California Avenue in Wahiawa from near its eastern terminus at Nonohe Street to Iliahi Park near Kilea Place.

Project Description: This project would provide a bike pathway on California Avenue in Wahiawa. The pathway would be approximately 1.0 mile long.

Evaluation: Currently, bicyclists must share the roadway with vehicles or ride on the narrow asphalt path provided on one side of the street. The path is not consistent and requires travel across driveways and dirt shoulders at some locations. Along the western portion of this segment, the travel lanes are 15 feet wide, and the road could be striped with bike lanes in each direction next to the vehicle lanes. However,

from north of Karsten Drive to the eastern terminus of the street, the lanes narrow and in some cases only 24 feet of asphalt roadway is available. In addition, adequate shoulder space or right-of-way does not appear to be readily available to provide an off-street path as noted above. Lastly, the daily traffic volumes along this segment are relatively low given its operation as a lengthy cul-de-sac street. As such, this project is not recommended for further consideration as a bicycle facility. To moderate vehicle speeds and enhance safety for bicyclists in this area, traffic calming should be considered and could include a combination of signage (e.g., radar feedback signs), horizontal treatments, and vertical measures.

Recommended for Further Evaluation: **No**

Project 201.10: Bike Pathway in Central Oahu Regional Park

Purpose: To provide a dedicated bike facility through the regional park connecting the existing northern terminus of Paiwa Street (north of Lumiauu Street) to Kamehameha Highway at the park entrance (opposite Ka Uka Boulevard).

Project Description: This project includes an off-street shared use path that could be installed by widening the existing meandering sidewalk through Central Oahu Regional Park to its current terminus. A new improved path would also have to be installed between the softball fields and Paiwa Street.

Evaluation: Currently, bicyclists must share the internal park roadways and parking lots with vehicles between the park entrance at Ka Uka Boulevard and the eastern side of the softball field complex. The remaining connection to Paiwa Street is unimproved and is essentially a dirt path that is now blocked by a tall gate and fence. This would allow a more direct and safer connection for bicyclists traveling between the Waipio and Waikele communities, and would provide another travel option for Waikele residents to access the park via walking and biking. This improvement would add 0.85 mile of pedestrian and bicycle infrastructure to the COTS area.

Recommended for Further Evaluation: **Yes**

2.2.2 Bicycle Lanes

Project 202.1: Bicycle Lanes on Ainamakua Dr between Mililani Park & Ride and Kualapa St

Purpose: To enhance bicycle travel and safety between the Ainamakua neighborhood and the area park & ride facility.

Project Description: This project would install bicycle lanes on Ainamakua Drive in the Ainamakua neighborhood. There would be a buffer between the travel lane and the bicycle lane.

Evaluation: Bicycle lanes could only be implemented on Ainamakua Drive by eliminating one of the existing vehicle lanes in each direction; the feasibility of this modification would have to be studied in more detail. The available width on Ainamakua Drive south of Meheula Parkway would allow for buffered bicycle lanes to be installed and would further improve the environment for people who bike. The constraint for this improvement occurs at the Meheula Parkway intersection itself where: 1) northbound cyclists would have to share the through/right-turn lane with motorists, and 2) southbound cyclists would have to cross the two right-turn lanes to continue through on Ainamakua Drive. If feasible, this improvement would add 0.75 mile of pedestrian and bicycle infrastructure to the COTS area.

Recommended for Further Evaluation: **No.** The City and County of Honolulu Department of Design and Construction recently installed bike lanes in Ainamakua Drive between Kualapa Street and Meheula Parkway under a repaving project.

Project 202.2: Bike Lanes on Meheula Parkway through the H-2 Interchange

Purpose: To provide a dedicated bike facility on Meheula Parkway across the H-2 interchange to separate vehicles and bicyclists and enhance bicycle travel and safety.

Project Description: This project includes the installation of bicycle lanes on Meheula Parkway across the H-2 Interchange.

Evaluation: As noted under Project 201.8, bicycle travel is challenging through the Meheula Parkway/H-2 interchange and includes multiple ramp crossings of which five are configured with higher speed merge configurations plus one multiple threat crossing of two off-ramp lanes. The installation of bicycle lanes through this interchange would only be used by the most confident cyclists and would still involve multiple lane changes and merges while navigating the roadway. Because Project 201.8 includes an off-street path and fewer required interactions with vehicles, it is recommended over this project at this location.

Recommended for Further Evaluation: **No**

Project 202.3: Bike Lanes on Meheula Parkway between the H-2 Interchange and Kapanoe Street

Purpose: To provide a dedicated bike facility on Meheula Parkway through most of Mililani Mauka to separate vehicles and bicyclists and enhance bicycle travel and safety.

Project Description: This project would install bicycle lanes on Meheula Parkway in Mililani Mauka.

Evaluation: Meheula Parkway is the primary roadway extending through Mililani Mauka and connects most of the neighborhoods and area schools. Bicycle lanes of approximately 5 feet in width could be striped in both directions between Lehiwa Street and Kapanoe Street without modifying the vehicle capacity in this corridor. Ten-foot lanes could be maintained adjacent to the bike lane in each direction. In the eastbound direction, a bicycle lane could also be extended from Ainamakua Drive to Lehiwa Street. However, west of Lehiwa Drive, Meheula Parkway includes three westbound vehicle lanes and an on-street bicycle lane could not be installed without removing one of those vehicle lanes. Given, the importance of encouraging bicycle travel and enhancing safety for cyclists, this project should be further evaluated from a design and capacity perspective to determine feasibility of including bicycle lanes along the entire segment and not just the sections with two travel lanes. Depending on the final design, this project would add up to 1.5 miles to the bicycle network in the COTS area.

Recommended for Further Evaluation: **Yes**

Project 202.4: Bicycle Lanes on Kuahelani Avenue between Hokuahiahi Park and Meheula Parkway

Purpose: To provide a dedicated bike facility on Kuahelani Avenue that will separate vehicles and bicyclists, and enhance bicycle travel and safety.

Project Description: This project includes the installation of bicycle lanes on Kuahelani Avenue between Meheula Parkway in Mililani and Hokuahiahi Park.

Evaluation: Kuahelani Avenue connects two neighborhoods in Mililani across Kamehameha Highway and provides access to multiple schools and parks. The section of Kuahelani Avenue that does not include front-on single family housing and/or where parking is currently prohibited extends between Hokuwa Street and the eastern intersection with Meheula Parkway, and between the western intersection with Meheula Parkway and Lanikuhana Avenue. Bicycle lanes could be striped along this section without affecting the adjacent travel lane, but parking would have to be prohibited along this length and would affect the on-street supply adjacent to several parks and in front of some multi-family housing

developments. At locations with adjacent parks or schools, it may be possible to ramp the bike lane up to the adjacent curb and create a path to allow on-street parking to be maintained. For the section of Kuaahelani Avenue between Hokuiwa Street and the western Meheula Parkway intersection, front-on single family housing is prevalent and may preclude the installation of bicycle lanes. If the front-on housing section is excluded from the project to provide more conservative estimates, this project would add up to 1.8 miles to the bicycle network in the COTS area.

Recommended for Further Evaluation: Yes

Project 202.5: Bicycle Lanes on Kamehameha Highway between H-1 and H-2

Purpose: To provide a separate bike facility on Kamehameha Highway linking Waipahu Street with Acacia Road using the existing ramp structures over the H-1 and H-2 ramps that will separate vehicles and bicyclists, and enhance bicycle travel and safety.

Project Description: This project originated in the 2012 Oahu Bike Plan and involves widening multiple bridge structures to provide a separate bike path that would add up to 1.3 miles to the bicycle network in the COTS area.

Evaluation: This alignment includes several very difficult transitions across higher speed, higher volume sections of Kamehameha Highway that would either require additional bridges or new traffic signals to designate right-of-way for cyclists to cross. Given the complexity of this project and the available alternatives to connect cyclists across or around the Waiawa interchange (Projects 201.5 and 201.7), this project is not recommended for inclusion in the COTS improvement program.

Recommended for Further Evaluation: No

Project 202.6: Bicycle Lanes on Kamehameha Highway from Waihona Street connecting to the Pearl Harbor Bike Path

Purpose: To provide a separate bike facility that will link the Pearl Highlands rail station at the Waihona Street/Kamehameha Highway intersection with the Pearl Harbor Bike Path that will separate vehicles and bicyclists, and enhance bicycle travel and safety.

Project Description: Two potential options were identified for this potential improvement. The first is to provide lanes or a path along Waiawa Road adjacent to Leeward Community College including Ala Ike. A second alignment would extend along Kamehameha Highway to Lehua Street, where bicycle lanes are planned to be added as part of a resurfacing and road diet project.

Evaluation: To connect to the Pearl Harbor path, acquisition of right-of-way would have to occur to link Ala Ike to the historic path. The challenging part of this second option is the multiple conflict points with relatively high speed ramp connections between Kamehameha Highway and Farrington Highway. Multiple new bridges would be needed to establish the desired connection for bicyclists with this alternative. Assuming that the Waiawa Road/Ala Ike alignment is preferred, this project would add up to roughly 0.8 mile to the bicycle network in the COTS area.

Recommended for Further Evaluation: Yes

2.2.3 Bicycle Routes

Project 203.1: Bicycle Route on California Avenue between Plum Street and Iliahi Elementary School

Purpose: To designate a bicycle route that will highlight the presence of cyclists to drivers and enhance overall bicycle travel and safety along California Avenue.

Project Description: California Avenue could be designated a bicycle route with signage, as well as traffic calming devices and enhanced crossings to maintain slower travel speeds consistent with its 25 mph posted speed limit. This street includes multiple school and park destinations that generate elevated bicycle and pedestrian volumes.

Evaluation: Bicycle routes include signage and pavement markings to increase driver awareness of the potential presence of cyclists and the need to share the roadway because a separate traveled way for cyclists cannot be provided. Route designations are appropriate where physical constraints preclude lanes or off-street paths, and where vehicle travel speeds and volumes are appropriate for cyclists to share vehicle lanes. The traffic volume of approximately 11,000 vehicles per day is higher than typically desired for a bicycle route.

Recommended for Further Evaluation: Yes

Project 203.2: Bicycle Route on Kunia Rd between Anonui St and Wilikina Dr

Purpose: To designate a bicycle route that will highlight the presence of cyclists to drivers and enhance overall bicycle travel and safety along Kunia Road.

Project Description: This project would include adding signage and pavement markings along Kunia Road for approximately 7.1 miles between Anonui Street in Waipahu and Wilikina Drive in Wahiawa.

Evaluation: Bicycle routes include signage and pavement markings to increase driver awareness of the potential presence of cyclists and the need to share the roadway because a separate traveled way for cyclists cannot be provided. Route designations are appropriate where physical constraints preclude lanes or off-street paths, and where vehicle travel speeds and volumes are appropriate for cyclists to share vehicle lanes. In the case of Kunia Road, this facility is a state highway and includes few bikable destinations along the majority of its segment length. It includes relatively high travel speeds and while its designation as a route would help to increase driver awareness, this project is not expected to substantially increase safety and would serve a negligible demand. In addition, the vast majority of this project length is outside the study area.

Recommended for Further Evaluation: No

Project 203.3: Bicycle Route on Leilehua Golf Course Rd between Kamehameha Hwy and Wikao St

Purpose: To designate a bicycle route that will highlight the presence of cyclists to drivers and enhance overall bicycle travel and safety along Leilehua Golf Course Road.

Project Description: This project would include adding signage and pavement markings on Leilehua Golf Course Road. Additional striping and minor curb modifications could be implemented to moderate speeds of vehicles using the H-2 ramps.

Evaluation: Bicycle routes include signage and pavement markings to increase driver awareness of the potential presence of cyclists and the need to share the roadway because a separate traveled way for cyclists cannot be provided. Route designations are appropriate where physical constraints preclude lanes or off-street paths, and where vehicle travel speeds and volumes are appropriate for cyclists to share vehicle lanes. This street could be designated a route with signage and enhanced crossings to maintain slower travel speeds consistent with its 25 mph posted speed limit.

Recommended for Further Evaluation: Yes

Project 203.4: Bicycle Route on Kamehameha Highway between Haleiwa Bypass Road and Kuahelani Avenue

Purpose: To designate a bicycle route that will highlight the presence of cyclists to drivers and enhance overall bicycle travel and safety along Kamehameha Highway.

Project Description: This project would include adding signage and pavement markings on Kamehameha Highway for approximately 12.4 miles between Mililani and Haleiwa on the North Shore.

Evaluation: Bicycle routes include signage and pavement markings to increase driver awareness of the potential presence of cyclists and the need to share the roadway because a separate traveled way for cyclists cannot be provided. Route designations are appropriate where physical constraints preclude lanes or off-street paths, and where vehicle travel speeds and volumes are appropriate for cyclists to share vehicle lanes. In the case of Kamehameha Highway from north of Wahiawa to central Mililani, this facility is a state highway and includes higher vehicle traffic volumes and travel speeds than desirable for a bike route where cyclists are expected to share the outside lane. Except for the section through Wahiawa Town, few bikable destinations exist or are planned, and the establishment of a route designation is not expected to significantly increase bicycle demand.

Recommended for Further Evaluation: **No**

Project 203.5: Bicycle Route on Anania Dr between Meheula Pkwy and Kipapa Gulch Path

Purpose: To designate a bicycle route that will highlight the presence of cyclists to drivers and enhance overall bicycle travel and safety along Anania Drive and provide a designated link to the proposed path crossing Kipapa Gulch.

Project Description: This project would include adding signage and pavement markings on Anania Drive between Meheula Parkway and Kipapa Gulch.

Evaluation: Bicycle routes include signage and pavement markings to increase driver awareness of the potential presence of cyclists and the need to share the roadway because a separate traveled way for cyclists cannot be provided. Route designations are appropriate where physical constraints preclude lanes or off-street paths, and where vehicle travel speeds and volumes are appropriate for cyclists to share vehicle lanes. In the case of Anania Drive, this street could be designated a route with signage, as well as traffic calming devices and enhanced crossings to maintain slower travel speeds consistent with its 25 mph posted speed limit. The link to the proposed Kipapa Gulch path will increase the need for a designated connection and the path is expected to increase demand on this street. Without Project 201.2, the need for the Anania Drive route is lessened, but would still exist.

Recommended for Further Evaluation: **Yes**

Project 203.6: Bicycle Route on Lanikuhana Ave from South end of Meheula Pkwy to Mililani Shopping Center

Purpose: To designate a bicycle route that will highlight the presence of cyclists to drivers and enhance overall bicycle travel and safety along Lanikuhana Avenue and provide a designated link to the Mililani Shopping Center.

Project Description: This project would include adding signage and pavement markings on Lanikuhana Avenue from Meheula Parkway in south Mililani to the Mililani Shopping Center in northern Mililani.

Evaluation: Bicycle routes include signage and pavement markings to increase driver awareness of the potential presence of cyclists and the need to share the roadway because a separate traveled way for cyclists cannot be provided. Route designations are appropriate where physical constraints preclude lanes or off-street paths, and where vehicle travel speeds and volumes are appropriate for cyclists to share vehicle lanes. In the case of Lanikuhana Avenue west of Kamehameha Highway, the street section includes two lanes in each direction, but the daily volume near Kealohi Street is less than 3,000 vehicles per day. Buffered bike lanes could be installed on the section west of the highway by repurposing the curb lane without substantially impacting vehicle operations. East of Kamehameha Highway, the volume is higher (nearly 12,000 vpd near Anania Drive) but the peak hour volumes of less than 700 vehicles per hour could still be accommodated with one travel lane in each direction, allowing for the continuation of buffered bike lanes. Bike lanes would have a more positive effect on safety and convenience for cyclists than just a route designation with signage. This project should be modified to study bike lane installation in lieu of a route.

Recommended for Further Evaluation: **Yes**, with proposed enhancement to bike lanes where feasible.

Project 203.7: Bicycle Route on Kamehameha Highway between Waipio Uka Street and Waipahu Street

Purpose: To designate a bicycle route that will highlight the presence of cyclists to drivers and enhance overall bicycle travel and safety along Kamehameha Highway in the community of Waipio.

Project Description: This project would include adding signage and pavement markings on Kamehameha Highway in Waipio to Waipahu Street in Waipahu and on the south side of H-1.

Evaluation: Bicycle routes include signage and pavement markings to increase driver awareness of the potential presence of cyclists and the need to share the roadway because a separate traveled way for cyclists cannot be provided. Route designations are appropriate where physical constraints preclude lanes or off-street paths, and where vehicle travel speeds and volumes are appropriate for cyclists to share vehicle lanes. In the case of Kamehameha Highway in Waipio, this facility is a state highway and includes vehicle traffic volumes in excess of 18,000 vehicles per day and higher observed travel speed than desirable for a bike route where cyclists are expected to share the outside lane of traffic. Project 201.4 calls for an off-street bike path where cyclists would be completely separated from traffic except at intersections where they would typically cross with pedestrians. As such, this project is deemed inferior to 201.4 and is not recommended.

Recommended for Further Evaluation: **No**

2.3 Pedestrian Projects

2.3.1 Location-Specific

Project 301.1: Crosswalk across makai leg of Kamehameha Hwy intersections at Olive and Avocado Streets

Purpose: To provide an enhanced crossing of all legs of the intersections that will facilitate direct pedestrian paths and further encourage walking as a desired mobility mode in Wahiawa Town.

Project Description: This project would add a crosswalk on the makai leg of Kamehameha Highway intersections with Olive Street and Avocado Street.

Evaluation: Most signalized intersections include marked crosswalks across all approaches of a four-legged intersection. In those cases where crosswalks and pedestrian signal phasing/heads are not provided, it is usually done to maximize vehicle signal phasing and capacity. In other cases, it is done where

multiple threat collisions are a possibility, where the view of pedestrians or cyclists are blocked by adjacent turning vehicles (e.g., at a dual right-turn movement). At Avocado Street, no obvious operational constraint is evident that would preclude a crosswalk across the highway.

Recommended for Further Evaluation: Yes

Project 301.2: Shared Use Path on Kamehameha Highway between Lanikuhana Ave and Meheula Pkwy

Purpose: To provide a connection for bicycles and pedestrians along Kamehameha Highway in central Mililani where no connection exists today.

Project Description: This project would install a shared use path on Kamehameha Highway in Mililani.

Evaluation: Kamehameha Highway in central Mililani is generally configured as an expressway facility with limited roadway access points and no fronting land uses. As such, sidewalks are limited or non-existent and no separate bicycle facilities are provided. Bus stops are located on the highway near major intersections but sidewalks providing access to the stops do not connect between intersections. The suggested shared use path could be provided on one or both sides of the highway, but given the lack of destinations between intersections, the isolated path would not generate any significant new active transportation demand or address any underserved volumes.

Recommended for Further Evaluation: No

2.3.2 General

Project 302.1: Safe Routes to School

Purpose: To identify and implement circulation improvements to all travel modes but with a focus on enhancing safety of active transportation modes to encourage walking and biking. Safe Routes to School (SR2S) plans include suggested routes for walking and biking that include controlled intersection and roadway crossings or areas with the least number and severity of potential vehicle conflicts.

Project Description: The purpose of this program is to help guide and educate students and guardians on recommended travel paths, raise awareness of appropriate walking and biking behavior, and identify potential infrastructure improvements to enhance safety. This program should be employed by all schools within the COTS area.

Evaluation: Preparation of a comprehensive SR2S plan can aid in obtaining funding for improvements and ultimately lead to increased use of walking and biking modes. In addition to the inherent safety benefits, ancillary benefits include improved health, community awareness, and expanded social interaction.

Recommended for Further Evaluation: Yes

Project 302.2: Pedestrian Crossing Safety

Purpose: To identify and implement improvements that will enhance safety of pedestrians when crossing streets and controlled and uncontrolled intersections.

Project Description: This project includes installation of devices to increase pedestrian safety. Potential improvements can range from education campaigns, minor infrastructure improvements (e.g., signing and striping), and more complex installations of traffic signals, rectangular rapid flashing beacons, etc.

Evaluation: The COTS area includes a wide range of streets and highways, some with characteristics that are not as conducive to pedestrian travel, especially at the intersection where crossing of a major or higher speed roadway is required. However, conditions can be hazardous on lower speed, low-volume roadways

when a pedestrian or driver is not paying attention and making safety of paramount importance. Pedestrian safety is best addressed when agencies take a proactive approach to addressing locations with a high number of or increased severity collisions, or based on public notification.

Recommended for Further Evaluation: Yes

Project 302.3: Mobility Hubs

Purpose: To provide a range of mobility and other services at select locations throughout a community to reduce dependence on the automobile and provide more sustainable transportation options.

Project Description: The concept of mobility hubs is not new, but it has evolved to incorporate a broader set of measures than were previously employed at locations that were previously known as intermodal centers. Mobility hubs can include a wide range of options including, but not limited to:

- Bikeshare
- Carshare
- Neighborhood electric vehicles
- Bike parking
- Dynamic parking management strategies (such as variable pricing by demand)
- Real-time traveler information
- Real-time ridesharing
- Demand-based shuttle or jitney services
- Bicycle and pedestrian improvements
- Directional signage
- Urban design enhancements
- Package delivery
- Supporting systems (mobile applications, electric vehicle charging, smart intersections, and a universal payment system)

Evaluation: The available transportation choices can be phased in over time as demand grows and new technologies are adopted by the local community and larger planning area. Larger hubs are typically implemented at transit stations or centers, and smaller hubs are located in surrounding areas to address first-mile/last-mile demands and to provide an extended network of non-auto travel options. Several agencies including the San Diego Association of Governments and Los Angeles Metropolitan Transportation Authority have established policies and guidelines to encourage mobility hub development through public-private partnerships, grant funding opportunities, etc. Sample locations for mobility hubs include: Mililani Town Center, Mililani Park and Ride, park locations within neighborhoods (e.g., Mililani District Park), and at shopping centers (e.g., Mililani Shopping center on Kipapa Drive at Kuahelani Avenue).

Recommended for Further Evaluation: Yes

2.3.3 Complete Streets

Project 303.1: Complete Streets project for California Ave between Kamehameha Hwy and Wahiawa District Park

Purpose: To better balance the mobility options amongst all modes and enhance safety for all road users on California Avenue in Wahiawa.

Project Description: The project includes implementing complete streets policies on California Avenue with the intent of moderating vehicle speeds, providing dedicated bicycle facilities, widening sidewalks

and waiting areas at intersections, shortening pedestrian crossing distances, and expanding the on-street parking supply.

Evaluation: The City & County of Honolulu Department of Transportation Services (DTS) has developed several plans for implementing projects that are driven by complete streets policies established in 2012. Improvements are often implemented during regularly schedules repaving projects, but can sometimes include additional and more substantive improvements that may include curb extensions, road diets, provision of on-street parking, bike lanes, enhanced transit stops, etc. The end result of these types of projects is increased pedestrian and bicycle activity, increased transit patronage (where applicable), often increased economic activity for adjacent businesses, and most importantly, improved safety and convenience for all travelers.

Recommended for Further Evaluation: Yes

Project 303.2: Complete Streets project for Kipapa Drive between Hookelewaa St and Mililani Waena Elementary School

Purpose: To create a safer environment for students walking to and from Mililani Waena Elementary School and Mililani High School and to improve commuting for all users balance.

Project Description: The reconfiguration of Kipapa Drive in front of Mililani Waena Elementary School a project includes implementing complete streets policies, as well as a neighborhood traffic circle to moderate vehicle speeds in the area. The project includes dedicated bicycle facilities, widening sidewalks and waiting areas at intersections, shortening pedestrian crossing distances, and providing dedicated passenger loading zones.

Evaluation: The City & County of Honolulu Department of Transportation Services (DTS) has developed several plans for implementing projects that are driven by complete streets policies established in 2012. Improvements are often implemented during regularly schedules repaving projects, but can sometimes include additional and more substantive improvements that may include curb extensions, road diets, provision of on-street parking, bike lanes, enhanced transit stops, etc. The end result of this projects is expected to be increased pedestrian and bicycle activity, reduced travel speeds, more predictable traffic flows, and most importantly, improved safety and convenience for all travelers.

Recommended for Further Evaluation: Yes

Project 303.3: Complete Streets Projects on Priority Roads

Purpose: To better balance the mobility options amongst all travel modes and enhance safety for all road users.

Project Description: Complete streets policies would be implemented on priority roads within the COTS area.

Evaluation: The City & County of Honolulu Department of Transportation Services (DTS) has developed several plans for implementing projects that are driven by complete streets policies established in 2012. Improvements are often implemented during regularly schedules repaving projects, but can sometimes include additional and more substantive improvements that may include curb extensions, road diets, provision of on-street parking, bike lanes, enhanced transit stops, etc. Overall, these projects typically provide dedicated bicycle facilities, widen sidewalks and waiting areas at intersections, shorten pedestrian crossing distances, add on-street parking where feasible and appropriate and reduce conflicts between vehicles and other users. Safety is enhanced and traffic speeds are moderated for the adjacent context.

Recommended for Further Evaluation: Yes

2.4 Roadway Projects

2.4.1 Ka Uka Boulevard and H-2 Interchange

Projects 401.1 through 401.8: Various improvements at the Ka Uka Boulevard/H-2 Interchange including Ramp Widening, Signal Modifications, and Overpass Widening

Purpose: These improvements would increase capacity at the interchange to accommodate new traffic and minimize project traffic impacts.

Project Description: The proposed improvements are all part of the mitigation package for the proposed Koa Ridge and Castle & Cooke Waiawa mixed-use developments located in the immediate vicinity of the subject interchange.

Evaluation: The EIS for the Koa Ridge project was reviewed, and it indicated that the proposed traffic improvements would result in traffic operations that would be Level of Service (LOS) D or better for all turning movements in 2025. While additional development would occur after that time, the proposed improvements would result in a standard interchange design that would provide significant additional capacity over current conditions. This additional capacity would help to accommodate traffic from other future development and would reduce delay caused by congestion from these additional volumes. These enhancements to the roadway system would reduce delays for autos and buses using the interchange to travel to and from the H-2 freeway while making regional trips to destinations Makai and Diamond Head of the COTS area.

Recommended for Further Evaluation: Yes

Project 401.9: Ka Uka Blvd and H-2 Flyover Ramp

Purpose: To provide a direct connection from the northbound off-ramp from H-2 to westbound Ka Uka Boulevard to avoid the interchange traffic signals and minimize vehicle delay.

Project Description: This project would construct a flyover ramp from H-2 to Ka Uka Boulevard.

Evaluation: The proposed flyover ramp would have to diverge from the off-ramp (or possibly back from the freeway mainline) to be able to provide enough clearance over the Ka Uka Boulevard overcrossing. In addition, the off-ramp is already projected to serve a volume in excess of 4,000 vehicles during the PM peak hour in 2025 according to the Koa Ridge TIAR. The flyover would likely have to land and connect to westbound Ka Uka Boulevard at some point between Moaniani Street and the future spine road serving Koa Ridge (located opposite the existing shopping center driveway). While this ramp is projected to serve over 1,800 vehicles in the PM peak hour, landing the ramp at the identified location would require excessive weaving for vehicles destined for Ka Uka Boulevard Ewa of the future spine road mixing with southbound off-ramp traffic from H-2. Given the volume on this ramp and the projected acceptable traffic operations at the interchange intersections in the Koa Ridge TIAR and EIS, a flyover ramp would not typically be recommended from an operations perspective, and was not required by HDOT as part of the final mitigation package for interchange operations.

Recommended for Further Evaluation: No

2.4.2 Ka Uka Boulevard

Projects 402.1 through 402.3: Various Improvements on Ka Uka Boulevard between Moaniani Street and Existing Commercial Driveway/New Spine Road

Purpose: These improvements would increase capacity in this corridor to accommodate new traffic and minimize project traffic impacts.

Project Description: The proposed improvements are all part of the mitigation package for the proposed Koa Ridge and Castle & Cooke Waiawa mixed-use developments located in the immediate vicinity of Ka Uka Boulevard.

Evaluation: The EIS for the Koa Ridge project was reviewed and it indicated that the proposed traffic improvements would result in traffic operations that would be Level of Service (LOS) D or better for all turning movements in 2025. While additional development would occur after that time, the proposed improvements would provide new surplus capacity over current conditions. This additional capacity would help to accommodate traffic from other future development and would reduce delay caused by congestion from these additional volumes. These enhancements to the roadway system would reduce delays for autos and buses using Ka Uka Boulevard to between the H-2 freeway and Kamehameha Highway.

Recommended for Further Evaluation: Yes

Project 402.4: New Road Serving New Development Diamond Head of the H-2 Freeway

Purpose: This improvement would provide direct access between the Castle & Cooke Waiawa portion of the development and the H-2 freeway via Ka Uka Boulevard, and would provide capacity for new traffic.

Project Description: The proposed improvement is part of the proposed Koa Ridge and Castle & Cooke Waiawa mixed-use developments located in the immediate vicinity of the H-2 interchange.

Evaluation: The EIS for the Koa Ridge project was reviewed and it indicated that the proposed traffic improvements would result in traffic operations that would be Level of Service (LOS) D or better for all turning movements in 2025. While additional development would occur after that time, the proposed improvements would provide new surplus capacity over current conditions. This additional capacity would help to accommodate traffic from other future development and would reduce delay caused by congestion from these additional volumes. These enhancements to the roadway system would reduce delays for autos and buses using Ka Uka Boulevard to between the H-2 freeway and Kamehameha Highway.

Recommended for Further Evaluation: Yes

2.4.3 Kamehameha Highway

Projects 403.1 through 403.4: Various Intersection Widening, Roadway Widening, and Signal Modification Improvements on Kamehameha Highway at Lumiaina Street, Waipahu Street and Ka Uka Boulevard

Purpose: These improvements would increase capacity at the subject intersections to accommodate new traffic and minimize project traffic impacts.

Project Description: The proposed improvements are all part of the mitigation package for the proposed Koa Ridge and Castle & Cooke Waiawa mixed-use developments located mauka of the identified intersections.

Evaluation: The EIS for the Koa Ridge project was reviewed and it indicated that the proposed traffic improvements would result in traffic operations that would be Level of Service (LOS) D or better for all turning movements through 2025. While additional development would occur after that time, the proposed improvements would provide significant additional capacity over current conditions. In addition, the roadway widening of the highway north of Ka Uka Boulevard would help with merging operations. This additional capacity would help to accommodate traffic from other future development and would reduce delay caused by congestion from these additional volumes. These enhancements to the roadway system would reduce delays for autos and buses using Kamehameha Highway and the intersecting streets while making regional and local vehicle trips within the COTS area.

Recommended for Further Evaluation: Yes

Project 403.5: Widen Kamehameha Highway from 3 to 4 Lanes between Ka Uka Blvd and Lanikuhana Avenue

Purpose: To reduce congestion on one of the primary arterial roadways through the COTS area and increase the overall vehicle capacity near one of the major growth areas on Oahu.

Project Description: This project has been identified in multiple long-range planning documents as a way to add new vehicle and bus transit capacity within the central portion of Oahu, and to specifically enhance the carrying capacity of one of the two key mauka-makai facilities in the COTS area. The majority of the section of the highway mauka of Ka Uka Boulevard includes an imbalanced section of two lanes mauka-bound and one lane makai bound. This project would add a second makai-bound lane to provide additional capacity to reduce delays prior to and through the Ka Uka Boulevard intersection and to eliminate merging operations, especially during the morning peak hour when the primary travel directional is makai-bound. It is important to note that this improvement would require construction of a new bridge adjacent to the Roosevelt Bridge over Kipapa Gulch to accommodate the two new travel lanes.

Evaluation: To determine the potential effect of making this improvement, the project was coded into the roadway and transit network of the OahuMPO travel demand model. This is currently the best planning tool available to for testing the effects of substantial land use, transportation network, and socio-economic changes on Oahu. The results of the model run showed that this improvement would reduce the number of congested lane-miles in the COTS area by 9, or by 16% in the AM peak period and increase the number of congested lane-miles by 2 or 3% in the PM peak period. A congested lane mile is the number of miles of through lanes on a given roadway segment where the volume to capacity ratio is greater than 90%. In addition, the benefit to local travel times between select zone pairs under Performance Measure 4 (from Deliverable B.2) would be a combined total of 12 minutes during the AM peak period.

Recommended for Further Evaluation: Yes

Project 403.6: Provide Additional Vehicle Capacity on Kamehameha Highway between the H-2 Freeway and Kilani Avenue (through Wahiawa)

Purpose: To reduce vehicles delays and congestion through Wahiawa Town, especially during the peak morning and evening commute periods.

Project Description: This project is not clearly defined in terms of adding through lanes or turn lanes, but regardless, the addition of through vehicle capacity would require the following:

- The elimination of all on-street parking,
- The elimination of left-turn pockets,

- Narrowing of the existing sidewalks,
- An imbalanced number of lanes that may require manual traffic control (e.g., a contraflow lane) during peak periods.

Evaluation: It is important to note that the bridge immediately mauka of Kilani Avenue already operates as a constraint and would need to be expanded before or at the same time as substantial improvements were made on Kamehameha Highway to make them truly effective. It is also of note that the overall circulation system is designed such that Wilikina Drive (leading directly to/from H-2) is the primary roadway serving North Shore traffic volumes. As such, this project is not recommended for inclusion in the rest of the COTS area studies.

Recommended for Further Evaluation: **No**

Project 403.7: Rehabilitate the Kamehameha Highway Roosevelt Bridge

Purpose: To rehabilitate the Roosevelt Bridge section of Kamehameha Highway to enhance safety and extend the life of this structure providing an important circulation link within the COTS area.

Project Description: This project would rehabilitate the Roosevelt Bridge. The bridge crosses Kipapa Gulch and is located on the highway mauka of Ka Uka Boulevard.

Evaluation: The State of Hawaii conducted a detailed inspection of this bridge and documented its findings in a report dated October 6, 2015. The detailed information from this inspection is included in Appendix X and contains photographs, an accompanying log with explanations of each picture, a plan/profile sheet depicting structural issues, and a final inspection report. In the final inspection report, defects for various structural elements are listed and rated Good, Fair, Poor or Severe. For each defect the affected area is assigned to one or more of these rating categories. Most elements are rated as Good to Fair with an area of the concrete deck and short length of the concrete bridge railing rated as Poor. However, none of the elements appear to have a substantial effect on the “strength and /or serviceability of either the element or the bridge.” The NBI item condition ratings for the superstructure, substructure, and channel/channel protection are 7 and the deck rating is 6. The final repairs, improvements and recommendations includes the repair of expansion joints, resurfacing the pavement overlay, repair of the large crack in south abutment ledge, repair the railing, and repair the broken support for a sagging water line.

Recommended for Further Evaluation: **Yes**

Project 403.8: Kamehameha Highway High Occupancy Vehicle Lanes from Ka Uka Boulevard to Farrington Highway

Purpose: To provide additional capacity within the highway corridor along the segment with the highest vehicle demand, but also to incentivize ridesharing and minimizing additional single occupant vehicle travel.

Project Description: Options for adding vehicle capacity within the highway corridor are limited and simply adding new mixed-flow lanes will further degrade merging operations onto the H-1 freeway unless more substantive downstream capacity is added. By providing HOV lanes on the subject segment, multi-occupant vehicles already traveling along the highway would have a dedicated right-of-way that would help bypass existing queues. The designation of these lanes as HOV-only facilities would encourage the practice of ridesharing and would decrease reliance on single occupant vehicle travel. To accomplish this project, the roadway would have to be widened and/or the median would need to be narrowed, and merging/diverging lanes would need to be provided at the ramp junctions to and from H-1.

Evaluation: This project was coded into the model assuming one HOV lane in each direction on the subject segment, and the results of the model run showed that the number of congested lane miles in the COTS area would be reduced by 3 and 2 lane-miles in the AM and PM peak periods, respectively. It would also reduce travel time between local origins and destinations by a total of 6 minutes.

Recommended for Further Evaluation: Yes

2.4.4 H-2 Interchanges

Project 404.1: New Pineapple Road Interchange

Purpose: This improvement would provide new direct freeway access to H-2 from the Koa Ridge portion of the development and would alleviate congestion and delay at the existing Ka Uka Boulevard/H-2 interchange.

Project Description: The proposed improvement is part of the proposed Koa Ridge and Castle & Cooke Waiawa mixed-use developments located in the vicinity of the H-2/Ka Uka Boulevard interchange.

Evaluation: The EIS for the Koa Ridge project was reviewed, and it indicated that the proposed traffic improvements would result in traffic operations that would be Level of Service (LOS) D or better for all turning movements in 2025. However, this interchange is required to provide these projected acceptable levels of service, and the addition of traffic from the new development would well exceed the capacity of the existing and proposed Ka Uka Boulevard interchange configurations without providing a new access point to the freeway. The TIAR specifically calls for all of the Koa Ridge-generated traffic between 2016 and 2025 to be served by the new Pineapple Road Interchange. Thus, this improvement is only recommended if the Koa Ridge development occurs, which is currently anticipated.

Recommended for Further Evaluation: Yes

Project 404.2: Widen WB Meheula Pkwy On-Ramp to Southbound H-2

Purpose: To reduce delays for traffic traveling from Mililani Mauka to southbound H-2, the on-ramp would be widened to include two lanes from Meheula Parkway. The merge area on the freeway would also have to be widened to minimize delays to freeway flow.

Project Description: This project would provide two lanes on the westbound Meheula Parkway on-ramp to southbound H-2 to improve local congestion.

Evaluation: During the AM peak period, this on-ramp experiences its highest traffic volumes and demand. On some days, the queues from this ramp extend back onto Meheula Parkway as traffic approaches the ramp junction. This hinders traffic flow on the arterial roadway and causes driver frustration, potentially leading to more aggressive driver behavior and can reduce safety for other users along the roadway includes pedestrians and cyclists. Stop and go traffic can also result in more rear-end collisions as drivers are traveling close together and may not anticipate sudden stops or starts in traffic.

By providing two lanes on the on-ramp, the local congestion is improved, but the additional flow of traffic onto the freeway mainline does not show any appreciable change (less than 2%) in the number of congested lane miles in the AM peak period, and regional travel times under Performance Measure 1 are actually projected to increase slightly (by 1 minute). The local benefit is a total reduction in travel between local destination pairs of 8 minutes. As noted above, implementing this improvement would require special consideration for designing bicycle and pedestrian facilities that avoid the multiple threat condition of crossing two on-ramp lanes.

Recommended for Further Evaluation: Yes

Project 404.3: Widen WB Kamehameha Highway On-Ramp to Northbound H-2 in Wahiawa

Purpose: To reduce delays for traffic using Kamehameha Highway and destined for the northbound H-2 freeway. The subject on-ramp currently narrows from one to two lanes but would be widened to improve merging operations and reduce the potential for queuing back to and on Kamehameha Highway.

Project Description: During the development of potential improvement projects, this ramp was identified as a potential bottleneck and a cause of congestion onto the highway and into Wahiawa.

Evaluation: Subsequent review of existing traffic delays and queuing shows that this ramp does not experience substantial delays or queuing and is not a primary cause of congestion in Wahiawa. A review of future forecasts from the OahuMPO model show that traffic growth on this ramp is projected to be limited and within the range of acceptable volumes for a one-lane ramp. Accordingly, this project is not recommended for further study and that other projects should be considered for implementation.

Recommended for Further Evaluation: **No**

2.4.5 H-1 and H-2 Interchange

Project 405.1: Waiawa H-1/H-2 Interchange – Eastbound to Southbound Merge Improvements

Purpose: To reduce delays and improve merge operations for traffic traveling from southbound H-2 to eastbound H-1.

Project Description: This project was originally studied as part of the H-1 Corridor Study conducted by the Hawaii Department of Transportation. The H-1/H-2 merge includes several lanes that align next to each other within the Waiawa interchange. This project would widen the freeway to install a more traditional lane drop on the right-hand side of the merge.

Evaluation: One lane from each of the freeways merges into the other as the lanes become parallel and the segments join together. This merge, especially at higher speeds is not a standard design and contributes to slowing of traffic primarily during the morning peak period when the predominant flows are eastbound and southbound on the H-1 and H-2, respectively. Widening the freeway to install a more traditional lane drop on the right-hand side of the merge would help to expedite flow, improve safety, and be more in line with driver expectation (especially by tourists who are less familiar with the roadway system). This project was originally studied as part of the H-1 Corridor Study conducted by the Hawaii Department of Transportation and showed a potential decrease of 14% in freeway density (i.e., vehicles per mile per lane) during the AM peak period, when southbound and eastbound traffic volumes are at their highest. However, by itself this project would not significantly reduce travel time during the AM peak period without additional downstream improvements that would provide additional capacity and ultimately reduce congestion. During off-peak times, this improvement would improve safety but would not be needed from a capacity perspective. This project was originally included in one of the major packages of improvements (Package D2) that extended east towards Moanalua Road.

Recommended for Further Evaluation: **Yes**, as long as it is included in a package of eastbound H-1 capacity enhancements.

2.4.6 Central Mauka Roads

Project 406.1: New Road between Mililani Mauka and Pearl City

Purpose: To provide additional mauka-makai vehicle capacity to and through the COTS area by constructing a new road between Mililani Mauka and the Waiawa/Pearl City area.

Project Description: The need for an additional access point serving the COTS area was discussed for many years and was last included in the regional transportation plan in 2006 as part of the ORTP 2030 document. In a subsequent report to the legislature in 2007, the Central Mauka Road project (as it was known then) ranked 7th out of 10 second access projects across the island of Oahu. To test the potential demand for this roadway, a two-lane roadway was coded into the OahuMPO travel demand model, which is the best available planning tool for projecting long-range traffic volumes. The roadway essentially connected the east side of Mililani Mauka with the Pearl City area via Waihona Street or possibly Waimano Home Road. A connection was assumed at the east end of Ka Uka Boulevard (east of H-2) and would provide access to new development occurring as part of the Koa Ridge and Waiawa area projects. The precise alignment and connection options would have to be determined through a detailed alternatives evaluation process.

Evaluation: The need for an additional access point serving the COTS area was discussed for many years and was last included in the regional transportation plan in 2006 as part of the ORTP 2030 document. In a subsequent report to the legislature in 2007, the Central Mauka Road project (as it was known then) ranked 7th out of 10 second access projects across the island of Oahu. To test the potential demand for this roadway, a two-lane roadway was coded into the OahuMPO travel demand model, which is the best available planning tool for projecting long-range traffic volumes. The roadway essentially connected the east side of Mililani Mauka with the Pearl City area via Waihona Street or possibly Waimano Home Road. A connection was assumed at the east end of Ka Uka Boulevard (east of H-2) and would provide access to new development occurring as part of the Koa Ridge and Waiawa area projects. The precise alignment and connection options would have to be determined through a detailed alternatives evaluation process.

The results of this preliminary evaluation showed that the new roadway could carry peak direction volumes ranging from 1,200 to 1,900 vehicles on the section makai of Ka Uka Boulevard. This would initially indicate the need for a four-lane roadway (two lanes in each direction). Mauka of Ka Uka Boulevard and the new development, the new road would serve between 800 and 1,200 vehicles in the peak direction and could be designed as a two-lane roadway. Purely from a demand perspective, this project would provide some circulation benefit to the COTS area but would only contribute to mode shift away from the automobile if some capacity was reserved exclusively for transit, such as dedicated bus lanes. This assumes that no other high quality transit service through the COTS area to the Pearl Highland rail station was provided.

From an operational perspective, this new roadway would reduce the number of congested lane miles by 4 miles, or 7% in the AM peak period, and no appreciable change in the PM peak period. The benefit to regional destinations per Performance Measure 1 would range from 3 to 6 minutes, and the benefit to local travel times (Performance Measure 4) is projected to a combined reduction of nearly 40 minutes in travel time. From an operational perspective, this new facility would substantially benefit the COTS area, but the constructability, environmental, and community issues will have to be addressed in the next phase of study.

Recommended for Further Evaluation: Yes

Project 406.2: New Road between Whitmore Avenue (Route 804) and California Avenue

Purpose: To provide additional connectivity between adjacent areas of Wahiawa that essentially operate as long cul-de-sac streets.

Project Description: Whitmore Village is physically separated from Wahiawa town by a major water feature that requires circulation by all travel modes to be made by traveling on Kamehameha Highway

between these areas and being subject to peak period delays caused by the one lane bridge mauka of Kilani Avenue. The proposed connection would:

- Increase connectivity between the two communities by providing added convenience and a more direct route to complementary land uses (retail and employment opportunities) for Whitmore Village residents,
- Provide a secondary route in the case of an emergency,
- Would reduce local travel on a more regional facility (i.e., the highway), and
- Provide a new multimodal connection for active transportation and transit.

In addition, the military uses at the end of Whitmore Avenue would also benefit from a second access point.

Evaluation: The total demand for this connection would not be substantial compared to other facilities in the COTS area and would require a new bridge over the water feature to serve all modes adequately. Evaluation of this project using the OahuMPO model showed no benefit to congested lane miles and a limited benefit to local travel times between key origins and destinations. While this project is still recommended, it is considered a lower priority from a circulation and regional benefit perspective.

Recommended for Further Evaluation: Yes

Project 406.3: New Road between California Avenue and Meheula Parkway

Purpose: To provide additional connectivity between the adjacent communities of Wahiawa and Mililani Mauka that have limited access points.

Project Description: Similar to Project 406.2, expanding connections between adjacent communities includes multiple benefits such as:

- Providing added convenience and a more direct route to complementary land uses (retail and employment opportunities) for all residents,
- Providing secondary routes in the case of an emergency,
- Reducing local/community travel on a more regional facility (i.e., the H-2 freeway), and
- Providing new multimodal connections for active transportation and transit.

Evaluation: Evaluation of this project was completed using the OahuMPO model and a connection between the mauka terminus of Lehiwa Drive and California Avenue makai of Karsten Drive was coded into the roadway network. This analysis showed no change in the number of congested lane miles in the AM peak period and an increase of 1 lane-mile in the PM peak period. Also, limited benefit to local travel times between key origins and destinations was projected with a travel time savings of only 1 minute. While this project is still recommended, it is considered a lower priority from a circulation and regional benefit perspective.

Recommended for Further Evaluation: Yes

2.4.7 Paiwa Extension

Project 407.1: Extend Paiwa Street from north of Lumiauau St to the Kamehameha Highway/Ka Uka Boulevard Intersection

Purpose: To provide additional connectivity between the adjacent communities of Waipio, Waikele and Waipahu that are currently provided by Lumiaina and Waipahu Streets.

Project Description: Paiwa Street currently terminates at the south end of Central Oahu Regional Park and currently no circulation is provided at this location including for bicyclists and pedestrians. This project would extend a road through the park that is assumed to serve all travel modes including transit.

Evaluation: Application of the regional model to evaluate the traffic implications of this project yielded some notable results. The addition of this connection would substantially change travel patterns in this portion of the COTS area and actually showed increases in travel times for both local destinations (over 50 minutes total) and regional travel (ranging from 4 to 11 minutes). In addition, increases of 6 and 11 congested lane miles in the AM and PM peak periods, respectively, are projected in the future. Based on these operational considerations and the challenge with developing a new standard capacity roadway through an established park environment, this project is not recommended for continued evaluation.

Recommended for Further Evaluation: **No**

2.4.8 Mililani Access

Project 408.1: New H-2 Interchange at Mililani Mauka

Purpose: To provide an alternate access from Mililani Mauka to H-2 to distribute traffic at more than one interchange and to provide an alternate access in case of emergency

Project Description: The sole vehicular, transit, bicycle and pedestrian access for the Mililani Mauka community is provided via Meheula Parkway where it intersects with the H-2 freeway. This limits circulation options for the community and focuses all of the demand at one location. To better distribute traffic and provide an alternate connection for emergency access or evacuation purposes, a connection to another interchange or freeway crossing is desirable. Two connections are possible: 1) a mauka connection to Wikao Street, which would provide access to the existing Mililani Tech Park interchange (via Leilehua Golf Course Road) or 2) a makai connection to the future Pineapple Road interchange that will serve the mauka portion of the planned Koa Ridge development. In both cases, alignments for these connections would have to be identified and studied from a feasibility and impact perspective.

Evaluation: Given the higher traffic demand to and from H-2 towards H-1, the makai connection to the future interchange was coded in the OahuMPO travel demand network. This scenario would provide the higher traffic volume estimates of the two connections. The connection for analysis purposes was made from Lehiwa Street without identifying a specific alignment or connection location.

The results of this evaluation showed that this new roadway would increase the number of congested lane miles slightly by 2 and 1 miles in the AM and PM peak periods, respectively. The effect of the project on travel to regional destinations from Mililani Town Center to regional destinations would vary a negligible amount (from -2 to +1 minutes) per Performance Measure 1. The benefit to local travel times (Performance Measure 4) is projected to be more noticeable with a combined 11 minute reduction. While the operational measures do not illustrate a clear overall benefit, this connection would enhance community connectivity and provide a means for Mililani Mauka residents to travel to and from complementary uses in Koa Ridge without ever having to use the H-2 freeway. This is in addition to the previously identified benefit of an alternate emergency access for the community.

Recommended for Further Evaluation: **Yes**

Project 408.2: New Road from Wikao St to Mililani Park & Ride

Purpose: To make a direct roadway connection between Wikao Street and the Mililani Park & Ride facility on Ukuwai Street

Project Description: This project would provide a direct connection from Wikao Street to the Mililani Park & Ride facility.

Evaluation: The existing connection between the Mililani Park & Ride facility and Wikao Street involves traversing the H-2 freeway and using the Mililani Tech Park and Meheula Parkway interchanges. While this is not a direct connection, numerous communities within Central Oahu are designed in this way and essentially function as cul-de-sac neighborhoods with some local travel required on regional facilities. The Wahiawa Park & Ride facility is closer to Wikao Street but it does not serve the same routes that access the Mililani Mauka Park & Ride facility. Any direct roadway connection from Wikao Street would have to connect to an existing residential street within Mililani Mauka, with the ideal street being Ukuwai Street. In the end, the estimated volume of traffic that would use a direct connection to access the Park & Ride facility only is expected to be very limited and ultimately this connection would be more of a neighborhood link. Given the low demand and potentially substantial environmental and topographic constraints, this project is not recommended for further study.

Recommended for Further Evaluation: No

Project 408.3: New Road between H-2 and Mililani Park & Ride

Purpose: To provide a direct connection between the H-2 freeway and the Mililani Park & Ride facility eliminating the need to use the Meheula Parkway interchange

Project Description: This project would provide direct access to the Mililani Park & Ride facility from the H-2 freeway.

Evaluation: Currently, all vehicles must access the Mililani Park and Ride facility via the Meheula Parkway interchange, Ainamakua Drive, and/or Ukuwai Street. While direct access to the Park & Ride lot from the freeway would be efficient and desirable, the current ramp configurations at the Meheula Parkway interchange preclude the addition of any other ramps to provide this access. Federal Highways Administration standards require minimum spacing between on and off ramps based on traffic volumes and typically require minimum one-mile spacing between interchanges. These standards makes this project infeasible, and this project is not recommended for further study. Project 102.5 Park & Ride with Flyer Stop in median mauka of Ka Uka Boulevard would make the parking lot more centralized, but private vehicle access would still likely be excluded from using ramps on the freeway to access the lot.

Recommended for Further Evaluation: No

Project 408.4: New Flyer Stops at H-2 with Pedestrian Pathway to Mililani Mauka Park and Ride Lot

Purpose: This project allows buses traveling on H-2 to serve passengers without leaving the H-2 right-of-way, saving travel time for both bus operations and passengers.

Project Description: The project would provide two bus-only ramps (mauka and makai bound) connecting to an elevated pedestrian and bicycle path and bridge (see **Figure 6**). The pedestrian and bicycle connection is between the Mililani Mauka park and ride lot and the green space on the Ewa side of H-2.

Figure 6. Conceptual Flyer Stops at H-2 and Mililani Mauka Park and Ride Lot



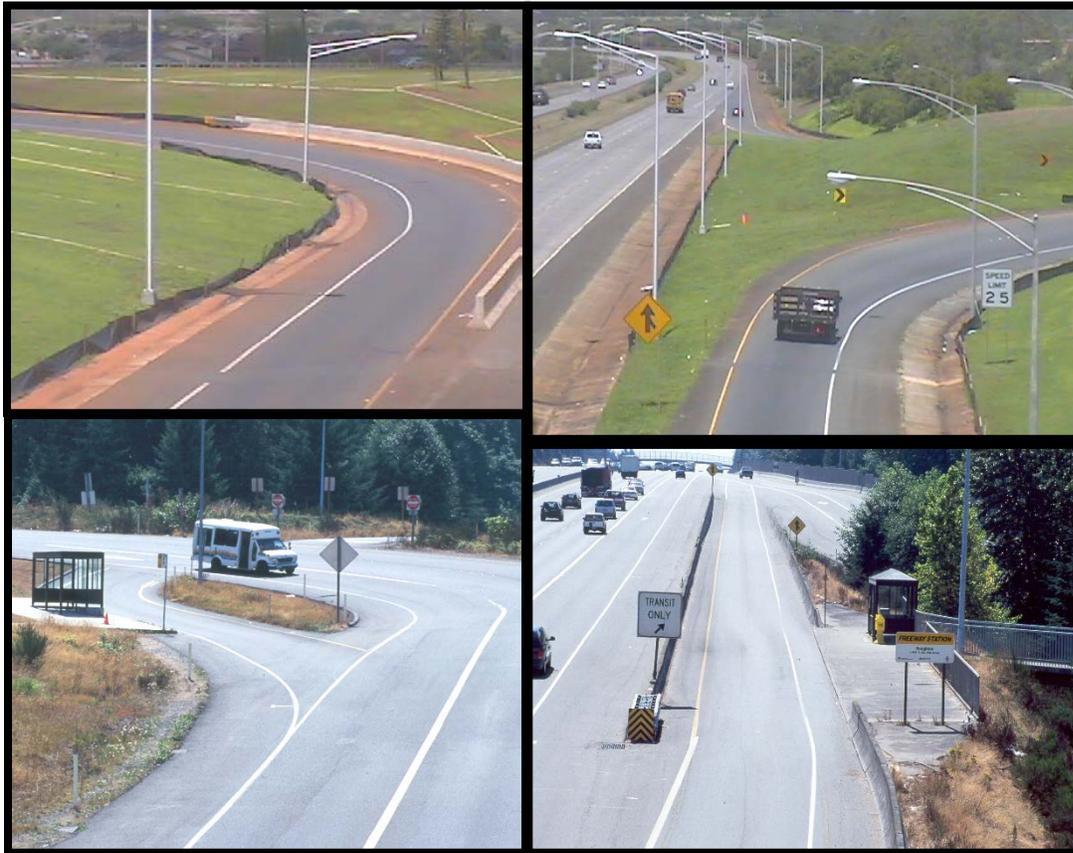
Figure 7 provides more detailed examples of how the existing H-2 ramps at this location compare to those in Seattle which have been upgraded to provide access to flyer stops. The top left picture in Figure 6 shows the existing H-2 on-ramp from Mililani town-bound. The bottom left picture shows a similar ramp on I-405 in Seattle with a flyer stop. The top right picture in Figure 6 shows the existing grass area between the H-2 off-ramp to Mililani and the H-2 on-ramp to Wahiawa. The bottom right picture shows a similar area on Seattle’s I-405 with a transit only access lane, a flyer stop and a pedestrian access bridge.

Evaluation: This project serves as a highly desirable alternative mode link between the two Mililani communities that can also be used for those not accessing bus services. It provides pedestrians and bicyclists an alternative safe pathway across the Meheula Parkway interchange with H-2 which is designed well for vehicle flow but is not friendly to other modes.

Express buses would avoid exiting the freeway and would save the 8 to 10 minutes traversing through the congested intersections to access the park and ride during peak periods. This project gives access to express services that already exist but bypass Mililani without negatively impacting riders that are onboard. Currently North Shore and Wahiawa express buses bypass Mililani. This project would add approximately 1,100 feet of separated pedestrian and bicycle facility to the Mililani/Mililani Mauka network. This link provides a protected crossing of H-2 avoiding on/off ramps and multiple vehicle movements.

Recommended for Further Evaluation: Yes

Figure 7. Flyer Stops with Direct Freeway Access within an Interchange in Seattle



2.5 Transportation Demand Management Projects

2.5.1 Transportation Demand Management

Projects 501.1 through 501.10: Transportation Demand Management Measures

Ten transportation demand management (TDM) techniques have been identified to help reduce single occupant vehicle travel both in the COTS area, as well as in other areas of the island of Oahu. Individually, most of these techniques would have a minimal impact on a change in mode split. However, packaged together these techniques can have a vehicle trip reduction of four to up to 15 percent and higher in transit-oriented development areas and areas with higher quality transit service.

Many successful TDM strategies are implemented by employers such as providing transit passes as part of their benefits package or providing preferred parking for vanpools. TDM programs are generally maintained by a division or office within a transportation agency (such as the Department of Transportation - DOT), the City or transit system (Department of Transportation Services - DTS) or by a private/public partnership such as a Transportation Management Association (TMA). Programs would provide the marketing, ridematching and access to services that are necessary to encourage a shift in transportation behavior. Currently, the DOT and DTS provide minimal TDM support. DTS does support a vanpool program operated by Enterprise Services.

The Koa Ridge Development is an example of an opportunity to apply TDM strategies from the outset. The developer, Castle & Cooke Homes Hawaii, Inc., will offer a 90% subsidized annual transit pass for each

new home as part of the Unilateral Agreement and Declaration for Conditional Zoning (November 6, 2013). This one action can provide the highest level of vehicle trip reduction. Other strategies and actions are planned to promote transit use. These measures could be incorporated into other existing residential and commercial developments including uses such as retail, office, and industrial. However, participation in a newly formed TMA would also require financial participation and possibly matching contributions from government agencies.

The following projects identified as 501.1 through 501.10 identify the ten TDM projects. All but 501.4, Major Special Events, have been recommended for further evaluation. The remaining nine strategies are suggested for further evaluation as a package.

Project 501.1: Free Real-Time Online Carpool Matching

Purpose: To provide easy access to carpool opportunities that can be scheduled in advance for repetitive commute trips or for the less frequent (two to three times a week) or occasional trips.

Project Description: This project provides a tool for residents and businesses to identify potential carpool opportunities.

Evaluation: This service together with the other TDM measures recommended for further evaluation provides a tool for residents and businesses to identify potential carpool opportunities.

Recommended for Further Evaluation: Yes

Project 501.2: Outreach Promotion and Marketing of Alternative Transportation

Purpose: Provides information about alternative transportation in an easy to access format.

Project Description: This project provides a tool for residents and businesses to identify alternative transportation opportunities.

Evaluation: This service together with the other TDM measures recommended for further evaluation provides a tool for residents and businesses to identify alternative transportation opportunities.

Recommended for Further Evaluation: As part of a package of TDM techniques, Yes

Project 501.3: Emergency Ride Home Program

Purpose: Emergency or guaranteed ride home programs provide a ride to commuters at little to no cost if an event occurs that requires the person to leave work early or stay late thereby missing their bus, carpool, or vanpool or other travel mode.

Project Description: This project provides an emergency or guaranteed ride home program for commuters. Taxis, transportation network companies, or other alternatives can be used.

Evaluation: This service addresses a concern that commuters have in using alternative modes. In past surveys and studies the comfort of knowing a ride home program exists has been identified as an important factor in a person's decision to use alternative modes. The cost of offering the program is generally low due to minimal use; however, it must be administered either by individual employers or a lead agency.

Recommended for Further Evaluation: As part of a package of TDM techniques, Yes

Project 501.4: Major Special Events

Purpose: To provide programs to encourage people to use alternative modes during special events that impact normal traffic.

Project Description: This is not a specific project that can be easily addressed and readily included in an implementation for the COTS region.

Evaluation: While valuable, this is not a specific project that can be easily addressed and readily included in an implementation for the COTS region.

Recommended for Further Evaluation: **No**

Project 501.5: Employer Based Commuter/Parking Programs

Purpose: Employers can have an impact on how employees commute to work. They can provide the information and incentives to encourage their employees to use alternative modes or they can provide free parking which encourages driving alone.

Project Description: This project includes employer based programs that can impact mode choice. Strategies include:

- Financial such as providing or cost sharing in transit passes
- Free or discounted parking for carpools and vanpools in lieu of free parking
- Free or discounted parking for one or two days a week if the employee usually uses alternative modes.
- Bicycle parking, secure storage, and changing areas to support cycling.
- Encourage or subsidize membership in Biki Bike if located near the bikeshare area.
- Adding emergency or guaranteed ride home discussed above.
- Adding working from home for one or more days a week for those jobs that can be done at home.
- Implementing flex hours for those businesses that do not require employees to be on site during specific hours.

Evaluation: Most employers in the small to medium size do not have the capability to develop an ongoing program. This type of strategy would need to rely upon an agency program or advocate.

Recommended for Further Evaluation: As part of a package of TDM techniques, **Yes**

Project 501.6: Emerging and Innovative Strategies - Carsharing

Purpose: To provide an alternative or substitute for private vehicle ownership.

Project Description: Vehicles are located in various locations such as residential areas and are usually priced by the hour. Two car households are able to drop to one car and some are able to drop car ownership altogether. This service is usually provided by car rental agencies (such as Enterprise in Waikiki). Car sharing is not meant to be the only travel choice, but a supplement to transit or other modes.

There are three types of carshare models:

1. For profit rental companies (Enterprise, Car2Go, Zipcar)
2. Not for profit co-operatives
3. Private where car owners rent their personal vehicles for short periods of time. A for profit company provides the internet or telephone app such as Turo (currently available in Honolulu), insurance and roadside assistance (if the owner signs up for these items).

Evaluation: The impact of carsharing is mixed. Some users will increase car travel since they have access to a vehicle that they may not have had before. Others have a significant decrease in vehicle travel. Variable costs are higher than a personal vehicle, so users will monitor their travel and use. Overall, the net result is a decrease in driving. The paper *Impact of Carsharing on Household Vehicle Holdings* found that each carshare vehicle decreased personal vehicle ownership by 9 to 13 vehicles.¹

Recommended for Further Evaluation: **Yes**

Project 501.7: Emerging and Innovative Strategies - Bikesharing

Purpose: To provide bicycles at multiple stations intended for short trips.

Project Description: Locations within the COTS area could provide an opportunity as a demonstration project for Biki Bike expanding into suburban areas such as at transit centers, mobility hubs, and shopping areas.

Evaluation: The recently implemented Biki Bike program in urban Honolulu has been a success. Biki Bike has a fleet of bicycles, a network of automated stations where the bikes are stored, and bike redistribution and maintenance programs. Bikeshare provides an option for the last mile of the commute.

Recommended for Further Evaluation: As part of a package of TDM techniques, **Yes**

Project 501.8: Vanpool Program

Purpose: To provide access to vanpooling as an alternate mode.

Project Description: Vanpools generally use rented vans that are supplied by employers, non-profit organizations or government agencies.

Evaluation: Vanpools are a good alternative for longer commutes which are experienced by COTS area drivers. DTS supports a vanpool program operated by Enterprise and has experienced some success on the military bases. Vanpools are generally self-supporting as operating costs are shared with members. Vanpools can have lower costs per vehicle mile than bus transit because a paid driver is not required and there are no vehicle deadhead costs from a central operating facility to the start of a trip.

Recommended for Further Evaluation: As part of a package of TDM techniques, **Yes**

Project 501.9: Support of Working from Home

Purpose: To identify benefits to employers to have employees work from home either full-time or one or more days a week.

Project Description: Businesses that do not require all employees to be onsite for their operations can be encouraged to promote working from home either full or part time.

Evaluation: Studies have shown that business can save money on office operations costs and parking (if provided) when employees work from home. Benefits include increased productivity, reduction in absenteeism (employees are able to work at home when, for example, their children are sick), helps attract and retain employees, and eliminates commuting stress on employees. As with most of the TDM strategies, an advocate or agency information program is beneficial in encouraging work at home programs.

¹ *Impact of Carsharing on Household Vehicle Holdings*; Elliot Martin, Susan A. Shaheen and Jeffrey Lidicker; Transportation Research Record: Journal of the transportation Research Board, No. 2143; 2010; pages 150-158.

Recommended for Further Evaluation: As part of a package of TDM techniques, **Yes**

Project 501.10: Support of Alternate/Shifted Work Hours

Purpose: To identify benefits to employers and employees to shift work hours to avoid the peak of the peak travel.

Project Description: Government and business offices can offer alternative work schedules including Compressed Work Week (CWW) and staggered shifts, depending on the type of business.

Evaluation: These strategies reduce peak period commute travel and help accommodate ridesharing and transit use. The total number of hours an employee works in a compressed work week does not change. However, the way the hours are scheduled can be difference. Typical compressed work week schedules include:

- 4/10s: Forty hours are worked in four 10-hour days
- 9/80s: Eighty hours are worked in eight 9-hour days and one 8-hour day
- 3/12s: Thirty-six hours are worked in three 12-hour days (this is common for medical personnel)

Recommended for Further Evaluation: As part of a package of TDM techniques, **Yes**.

2.5.2 Intelligent Transportation System

Project 502.1: Intelligent Transportation Solutions (Real-time traffic info, dynamic signage, adaptive signals)

Purpose: To better inform drivers as to their travel options,(including alternative driving routes and alternate modes of travel) and expectations for their current trip and travel time, as well as providing capacity enhancements that do not require additional lane construction.

Project Description: This project includes a wide range of specific improvements including: phone apps to inform travel choices prior to departure, dynamic message signs along the highway indicating travel time to destinations and time by transit, ramp metering at on-ramps to freeways, adaptive signals on major arterials to maximize traffic flow efficiency and adjust to changing demands, etc. Some of the elements are already being implemented by DOT and DTS, but the level of investment and infrastructure could be increased for these elements in the COTS area. For example, ramp metering in other states has been extremely effective in managing freeway flow, reducing corridor delays, and serving as an additional incentive to use non-auto travel modes. However, it also includes secondary impacts including congestion on arterial and local streets and possibly diversion to other roadways depending on the adjacent roadway network if not implemented in a comprehensive and systematic way. According to the Federal Highways Administration (FHWA), adaptive signals have been shown to increase capacity along corridors by 5% to 15% based on studies in other jurisdictions, and reduce travel time by an average of 10%. Overall, adaptive signals have been implemented nationally at less than 1% of candidate sites according to the same source.

Evaluation: The impacts of most of these elements cannot be readily analyzed given that they involve driver behavior and mode choice that could vary from day to day. In some cases, such as ramp metering, detailed studies can be performed once locations for meter locations have been identified. The H-1 Corridor Planning Study did evaluate several options for ramp metering including metering of ramps outside the urban core, as well as meters on freeway-to-freeway ramps. These improvements could provide substantial benefit to the H-1 Freeway downstream of the COTS area in terms of congestion reduction and managing traffic by simply restricting flow onto the freeway during peak periods. However, this approach comes at the expense of significant queuing on local streets intersecting the freeway, or on

selected freeway segments (e.g., makai bound H-2 in the morning). Initial installations of ramp metering (i.e., test projects) could be used west of H-2 to manage demand and incentivize use of the rail transit system, once it is fully operational.

Recommended for Further Evaluation: Yes

2.6 Pricing Projects

Project 601.1: Congestion Pricing on H-1 or H-2

Purpose: To manage congestion through pricing the use of vehicular access points to the COTS area.

Project Description: Congestion pricing or cordon pricing has been studied abroad and in Honolulu, and is currently in use in several major metropolitan areas including downtown London, Singapore, Stockholm, and Milan. Four general types of systems are in use:

- 1) A cordon area around a city center, with charges for passing the cordon line.
- 2) Area wide congestion pricing, which charges for being inside an area.
- 3) A city center toll ring, with toll collection surrounding the city.
- 4) Corridor or single facility congestion pricing, where access to a lane or a facility is priced.

Evaluation: In the case of Honolulu, cordon pricing was studied in a previous version of the Oahu Regional Transportation Plan (2035) as documented in the Final Alternative Scenarios Summary Report, December 2010. This analysis examined cordon pricing around downtown Honolulu and concluded that it would be effective in shifting trips to active and transit modes and but other measures such as vehicle miles of travel (VMT) and vehicle hours of delay (VHD) did not change significantly. However, the vast majority of the COTS area does not experience the level of congestion observed in downtown Honolulu. Major congestion in the COTS area generally occurs on the Kamehameha Highway and H-2 approaches to the H-1 freeway, and future congestion is expected to be focused on interchanges, and on segments where additional vehicle capacity is needed (e.g., Kamehameha Highway mauka of Ka Uka Boulevard). On most streets in most communities, traffic congestion is expected to be limited through 2040. As such, cordon pricing is not expected to be an effective tool in managing congestion in the COTS area.

Recommended for Further Evaluation: No

Project 601.2: High Occupancy Toll Lanes

Purpose: To manage vehicle demand in specific lanes on freeways and possibly major arterials through pricing.

Project Description: High occupancy toll (HOT) lanes (also referred to as Express Lanes or Managed Lanes) are HOV lanes that are tolled for various users. To manage demand in these lanes, charges can vary for each vehicle type: 2-person carpool, 3+-person carpool, high occupancy vehicles (buses and shuttles) and single occupant vehicles (SOVs). For lower demand facilities, carpools and buses are often not charged, but SOVs must pay a toll that may vary over the course of the day depending on the level of congestion. On higher demand facilities, SOVs and 2-person carpools may be charged but vehicles with 3 or more persons are exempt from the toll.

Evaluation: This type of project is typically only effective when a substantive length or network of HOV lanes is provided. For example, use of the contraflow lane on H-1 could be modified to require a toll since it provides a continuous HOV facility nearly 12 miles in length in the AM peak period. It should be noted that only a short section (roughly 3 miles) of the contraflow lane is located within the COTS area. Similarly, the HOV lane on H-2 could be tolled and charges could be based on distance traveled in those facilities.

In addition to helping to manage demand and incentivize the use of carpooling and non-auto modes, tolling also provides an additional revenue stream to assist with system maintenance and possibly enhancement of other modes that would reduce regional travel demand. In some regions such as San Diego, the revenue after toll operating costs is used to enhance transit service through BRT enhancements on freeway facilities.

Similar to Project 601.1 above, a managed lane evaluation was included in a previous version of the Oahu Regional Transportation Plan (2035) and documented in the Final Alternative Scenarios Summary Report, December 2010. This study found that no excess capacity was available to sell in the AM zipper lane or the HOV 2+ lane due to forecasted 2035 HOV demand. As a result, both the AM zipper lane and the HOV 2+ occupant lane were tolled for the managed lane scenario, essentially pricing out some HOV 2-occupant demand to provide capacity for the SOV demand, Interestingly, relatively no change in mode share occurred between auto, transit, bicycle, and pedestrian trips but some non-tolled auto trips became tolled trips.

In summary, HOT lanes should be considered a possible option for managing congestion in the future within the COTS area and elsewhere but several key issues are associated with this project:

- Statutory authority for tolling (managed pricing) has not been granted by the Hawaii State Legislature.) Therefore the State nor any of its counties have the ability to set tolls for the use of roads, and state legislation would have to change to implement this project.
- Substantial infrastructure would have to be installed including overhead readers, signage, and a tolling technology system.
- Tolling of new HOV lanes (such as those included in Project 403.8 on Kamehameha Highway) would require direct connections (i.e., ramps) to other HOV facilities to make them an effective part of the managed lane system, and those connections have not been identified in this study.

Recommended for Further Evaluation: Yes

Project 601.3: Parking Strategies

Purpose: To better manage parking demand and to incentivize the use of active and transportation modes where traffic congestion is excessive.

Project Description: A comprehensive set of parking strategies that take into account the context and values of the various communities and the desired outcomes for mobility and use of public spaces for parking. Strategies should account for the evolution that is occurring in the transportation realm in terms of a shared economy, transportation network companies (e.g., Uber, Lyft), and the advent of autonomous vehicles.

Evaluation: Parking is a complex issue that involves many aspects of mobility including mode choice, quality of life, economic development etc. In addition, parking demand and the required supply varies in terms of street typology, adjacent land use type and density, proximity to transit, and roadway capacity needs. For example, peak period parking restrictions can be employed on some streets to maximize the use of lanes during the highest demand times, but provide a parking supply at other times of day when that capacity is not needed. In low-density residential areas, parking is typically not a problem, but needs to use road space for other modes (e.g., installing bike lanes) can lead to some hard choices for the public and decision-makers. In areas where higher density development will occur, such as portions of Koa Ridge, parking supplies may (and should) be reduced below typical rates as long as they include a robust bicycle and pedestrian network, a dense connected street grid, and effective transit service including community

circulators. Lastly, charging for parking at places like the future Pearl Highlands rail transit station can help to shift drivers to use other modes like bus transit to access the station, provided that high quality and convenient alternatives (such as BRT) are available.

Recommended for Further Evaluation: Yes

2.7 Summary of Project Performance

Each project in **Table 1** was evaluated in terms of its performance using a series of quantitative and qualitative measures that were established in Deliverable B-2 of this project. The analysis presented in **Section 2.1** through **Section 2.6** resulted in a decision regarding whether a project is recommended for further evaluation. **Table 3** provides a summary of these recommendations. In summary, out of 90 initial projects, 62 are recommended for further evaluation and 9 are recommended for further evaluation as a package. The 71 individual projects are scored and ranked in **Section 3.0**. Further evaluation will consider the nine (9) TDM projects as one package.

Table 3. Summary of Project Recommendations

Project Number	Project Description	General Location	Recommended for Further Evaluation?
100 TRANSIT PROJECTS			
101.0	GENERAL		
101.1	Bus Service Expansion	Islandwide	Yes
101.2	Construct Transit Centers	Islandwide	Yes
101.3	City Operations & Maintenance, including Bus Stop/Shelter Conditions	Islandwide	Yes
101.4	Human Services Transportation Coordination Program	Islandwide	No
102.0	HIGH CAPACITY TRANSIT		
102.1	HART rail technology between Wahiawa and Pearl Highlands Rail Station	Central Oahu	Yes
102.2	Light Rail between Wahiawa and Pearl Highlands Rail Station	Central Oahu	Yes
102.3	Bus Rapid Transit between Wahiawa and Pearl Highlands Rail Station	Central Oahu	Yes
102.4	Flyer Stops between Wahiawa and Pearl Highlands Rail Station	Central Oahu	No
102.5	Park and Ride with Flyer Stop in median mauka of Ka Uka Blvd	Central Oahu	Yes
102.6	HART rail technology between Mililani and Pearl Highlands Rail Station	Central Oahu	Yes
102.7	Aerial Gondola between Waipio and Wahiawa	Central Oahu	No
102.8	Aerial Gondola between Waipio and Pearl Highlands Rail Station	Central Oahu	Yes
200 BICYCLE PROJECTS			
201.0	BICYCLE PATHS (Off-street bicycle facility)		
201.1	New Pathway on Waipahu St between Paiwa St and Kamehameha Hwy	Central Oahu Regional Park	Yes

Table 3. Summary of Project Recommendations (cont.)

Project Number	Project Description	General Location	Recommended for Further Evaluation?
201.2	New Pathway between Anania Dr and Central Oahu Regional Park	Kipapa Gulch	Yes
201.3	New Direct Kipapa Gulch Bike Bridge and Pathway	Kipapa Gulch	No
201.4	New Bike Pathway along Kamehameha Hwy. from Ka Uka Boulevard to Waipahu Street	Waipio	Yes
201.5	New Ped/Bike Path connecting Kamehameha Hwy at Waipahu Street to Leeward Community College Rail Station	Leeward Community College	Yes
201.6	New Bike Pathway along Kamehameha Hwy. between Wahiawa and Anania Dr	Wahiawa	Yes
201.7	Bike Pathway on Cane Haul Road between H-2 and Pearl Highlands Rail Station	Pearl Highlands	Yes
201.8	Bicycle pathway infrastructure through the H-2/Meheula Parkway Interchange	Mililani	Yes
201.9	Bike pathway along California Ave. between Kilea Pl. and Nonohe St	Wahiawa	No
201.10	Bike Pathway in Central Oahu Regional Park between Kamehameha Hwy and Paiwa St	Mililani	Yes
202.0	BICYCLE LANES (On-street bicycle facility delineated from vehicle traffic)		
202.1	Bicycle lanes on Ainamakua Dr between Mililani Park and Ride and Kualapa St	Mililani Mauka	Yes
202.2	Bicycle lanes on Meheula Parkway through Mililani H-2 Interchange	Mililani	No
202.3	Bicycle lanes on Meheula Parkway between Mililani H-2 Interchange and Kapanoe St	Mililani Mauka	Yes
202.4	Bicycle lanes on Kuahelani Avenue between Hokuahiahi Park and Meheula Parkway	Mililani	Yes
202.5	Bicycle lanes on Kamehameha Highway between H-1 and H-2	Waiawa Interchange	No
202.6	Bicycle lanes on Kamehameha Highway from Waihona St. connecting to Pearl Harbor Bike Path	Waipio	Yes
203.0	BICYCLE ROUTES (On-street bicycle facility with street signs and/or sharrows)		
203.1	Bicycle route on California Ave between Plum St and Iliahi Elementary	Wahiawa	Yes
203.2	Bicycle route on Kunia Rd btwen Anonui St and Wilikina Dr	Schofield to Waikele	No
203.3	Bicycle route on Leilehua Golf Course Rd between Kamehameha Hwy and Wikao St	Waipio Acres	Yes
203.4	Bicycle route on Kamehameha Highway between Haleiwa Bypass and Kuahelani Ave	Mililani	No

Table 3. Summary of Project Recommendations (cont.)

Project Number	Project Description	General Location	Recommended for Further Evaluation?
203.5	Bicycle route on Anania Dr between Meheula Pkwy and Kipapa Gulch Path	Mililani	Yes
203.6	Bicycle route on Lanikuhana Ave from South end of Meheula Pkwy to Mililani Town Center	Mililani	Yes
203.7	Bicycle route on Kamehameha Hwy between Waipio Uka St and Waipahu St	Waipio	No
300 PEDESTRIAN PROEJCTS			
301.0 LOCATION-SPECIFIC			
301.1	Crosswalk across makai leg of Kamehameha Hwy and Avocado St intersection	Wahiawa at Olive Ave	Yes
301.2	Shared use path on Kamehameha Hwy between Lanikuhana Ave and Meheula Pkwy	Mililani	No
302.0 GENERAL			
302.1	Safe Routes to School	Islandwide	Yes
302.2	Pedestrian Crossing Safety	Islandwide	Yes
302.3	Mobility Hubs	COTS area transit centers	Yes
303.0 COMPLETE STREETS			
303.1	California Ave between Kamehameha Hwy and Wahiawa District Park	Wahiawa	Yes
303.2	Kipapa Dr between Hookelewaa St and Mililani Waena Elementary School	Mililani	Yes
303.3	Complete Streets modifications on priority roads	Central Oahu	Yes
400 ROADWAY PROJECTS			
401.0 KA UKA BLVD. & H-2 INTERCHANGE			
401.1	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (freeway ramp widening & signal modification)	Waipio Interchange	Yes
401.2	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (freeway ramp approach widening)	Waipio Interchange	Yes
401.3	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St. (freeway ramp approach widening)	Waipio Interchange	Yes
401.4	Ka Uka Blvd & H-2 Northbound Off-Ramp to Limuana St (freeway ramp signal modification)	Waipio Interchange	Yes
401.5	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St (freeway ramp widening & signal modification)	Waipio Interchange	Yes
401.6	Ka Uka Blvd & H-2 Northbound Off-Ramp to Ka Uka Blvd (freeway ramp relocation & widening)	Waipio Interchange	Yes

Table 3. Summary of Project Recommendations (cont.)

Project Number	Project Description	General Location	Recommended for Further Evaluation?
401.7	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	Yes
401.8	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	Yes
401.9	Ka Uka Blvd & H-2 Flyover Ramp	Waipio Interchange	No
402.0	KA UKA BOULEVARD		
402.1	Ka Uka Blvd between Moaniani St and Commercial Driveway/Spine Rd (lane addition)	Waipio	Yes
402.2	Ka Uka Blvd Intersection with Commercial Driveway/Spine Rd (intersection lane & signal modification)	Waipio	Yes
402.3	Ka Uka Blvd Intersection with Commercial Driveway/Spine Rd (intersection widening & modification)	Waipio	Yes
402.4	Ka Uka Blvd between H-2 and new development (new road)	Waipio	Yes
403.0	KAMEHAMEHA HIGHWAY		
403.1	Kamehameha Hwy & Lumiaina St Intersection (intersection widening & signal modification)	Waipio	Yes
403.2	Kamehameha Hwy & Waipahu St Intersection (intersection restriping & signal modification)	Waipio	Yes
403.3	Kamehameha Hwy & Ka Uka Blvd Intersection (intersection widening)	Waipio	Yes
403.4	Kamehameha Hwy between Ka Uka Blvd and North of Ka Uka Blvd. (add NB lane)	Waipio	Yes
403.5	Kamehameha Hwy between Ka Uka Blvd and Lanikuhana (widen from 3 to 4 lanes)	Waipio to Mililani	Yes
403.6	Kamehameha Hwy between H-2 and Kilani Ave (unknown)	Wahiawa	No
403.7	Kamehameha Hwy Roosevelt Bridge (rehabilitation)	Kipapa Gulch	Yes
403.8	Kamehameha Hwy HOV lanes (Ka Uka Boulevard to Farrington Hwy)	Central Oahu	Yes
404.0	H-2 INTERCHANGES		
404.1	H-2 & Pineapple Road Interchange	New Interchange	Yes
404.2	H-2 & Meheula Pkwy (widen on-ramp)	Mililani Mauka	Yes

Table 3. Summary of Project Recommendations (cont.)

Project Number	Project Description	General Location	Recommended for Further Evaluation?
404.3	H-2 & Kamehameha Hwy (widen on-ramp)	Wahiawa	No
405.0	H-1 & H-2 INTERCHANGE		
405.1	Waiawa H-1/H-2 Interchange Eastbound/Southbound Merge Improvements	Waiawa Interchange	Yes
406.0	CENTRAL MAUKA ROADS		
406.1	New Road between Mililani Mauka and Pearl City	Central Oahu	Yes
406.2	New Road between Whitmore Ave (SR 804) and California Ave	Wahiawa	Yes
406.3	New Road between California Ave and Meheula Pkwy	Wahiawa	Yes
407.0	PAIWA EXTENSION		
407.1	Extend Paiwa St from north of Lumiauau St to Kamehameha Hwy/Ka Uka Blvd intersection	Central Oahu	No
408.0	MILILANI ACCESS		
408.1	New H-2 Interchange at Mililani Mauka	Mililani Mauka	Yes
408.2	New road from Wikao St to Park and Ride	Mililani Mauka	No
408.3	New road between H-2 and Park and Ride	Mililani Mauka	No
408.4	New flyer stops at H-2 with pedestrian pathway to Park and Ride	Mililani Mauka	Yes
500	TRANSPORTATION SYSTEM MANAGEMENT		
501.0	TRANSPORTATION DEMAND MANAGEMENT		
501.1	Free real-time online carpool matching	Central Oahu	Yes, as TDM Package
501.2	Outreach promotion and marketing of alternative transportation	Central Oahu	Yes, as TDM Package
501.3	Emergency ride home program	Central Oahu	Yes, as TDM Package
501.4	Major special events (e.g., Mililani Holiday Parade)	Central Oahu	No
501.5	Employer based commuter/parking programs	Central Oahu	Yes, as TDM Package
501.6	Emerging and innovative strategies - Carsharing	Central Oahu	Yes, as TDM Package
501.7	Emerging and innovative strategies - Bikesharing	Central Oahu	Yes, as TDM Package
501.8	Vanpool program	Central Oahu	Yes, as TDM Package
501.9	Support of working from home	Central Oahu	Yes, as TDM Package
501.10	Support of alternate/shifted work hours	Central Oahu	Yes, as TDM Package

Table 3. Summary of Project Recommendations (cont.)

Project Number	Project Description	General Location	Recommended for Further Evaluation?
502.0	INTELLIGENT TRANSPORTATION SYSTEMS (ITS)		
502.1	ITS (Real-time traffic info, dynamic signage, adaptive signals, etc.)	Central Oahu	Yes
600	PRICING SOLUTIONS		
601.0	PRICING		
601.1	Congestion pricing/ramp metering on H-1 or H-2	Central Oahu/ Islandwide	No
601.2	HOT lanes	Central Oahu	Yes
601.3	Parking strategies	Central Oahu	Yes

- Sources:*
1. Central Oahu Sustainable Communities Plan 2016
 2. Central Oahu Sustainable Communities Plan 2002
 3. Oahu Regional Transportation Plan 2040
 4. Transportation for Oahu Plan 2025
 5. Koa Ridge Traffic Impact Analysis Report
 6. Other Study
 7. Added by Project Team
 8. Added by Public

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3.0 PROJECT SCORING AND RANKING

The ranking of projects was established by synthesizing an extensive amount of technical data and qualitative information to create a ranking system that will be used as input to the recommended program of short-term, mid-term, and long-term COTS area improvements. The ranking system is based on individual scores for each potential benefit. The scoring process by which this was accomplished is presented in the sections below.

3.1 Approach and Methodology

The intent of this effort was to use a systematic process to initially rank individual projects that would enhance mobility within the COTS area. Projects were evaluated based on their merit through an evaluation of traffic operating conditions, the benefits they are expected to provide, and the potential impacts resulting from their implementation. This process will be used to guide the development of a phased implementation program. The results of the ranking process are not intended to be absolute, but merely one method of comparing a wide variety of improvements against a uniform baseline of criteria.

The criteria used in the project ranking matrix process were based on several sources including: the overarching transportation goals of OahuMPO, the specific COTS study goals, the community values expressed by stakeholders and participants in the public outreach process, and industry practice. The use of all-encompassing metrics to initially prioritize and rank projects would have been cumbersome, complex, and not meaningful in terms of distinguishing projects from one another. For example, comparing a local bicycle pathway project with a new roadway or congestion pricing was not possible using a single set of measures for all projects. Instead, key performance metrics were used to evaluate comparable projects and a separate “project score” was determined for ranking purposes. The key areas for comparison scoring are:

- Area of benefit
- Number of other modes enhanced
- Contributes to mode share goal
- Potential to reduce vehicle congestion
- Enhanced infrastructure condition
- Safety
- Deficiency status.

Each of these areas is described in more detail in the following sub-sections. The complete tables showing individual project scoring are presented in **Table 5**, **Table 6**, and **Table 7** in **Section 3.2**. It should be noted that projects that were not recommended for further evaluation in **Section 2.0** of this report were not included in the scoring and ranking process.

3.1.1 Area of Benefit

This study includes a wide variety of improvements. Each of the proposed improvements has a different range of impact or area of benefit. For example, a bicycle path will help to expand the bicycle network within the overall study area but by itself may have a very localized impact relative to the rest of the COTS region. Other projects, such as HOV lanes, may provide substantial additional lane capacity that will likely change regional travel in and through multiple communities. Lastly,

The area of benefit scoring is as follows:

- *Regional = 3*
- *Local = 2*
- *Program-Level = 1, where regional projects are deemed to have the highest value.*

TDM measures and other programs can be applied across a wide geographic area and have less of a local impact. However, these measures may require additional elements or projects to be effective.

3.1.2 Number of Other Modes Enhanced

A primary goal of the COTS project is to identify mobility improvements and programs that result in a sustainable transportation system and ultimately require less reliance on single-occupant travel. To that end, one of the key performance measures is the reduction in the use of single occupant vehicles by commuters from an existing level of 75% of all commute trips to a future level of 60% by 2040. A key metric in accomplishing this goal is to identify which projects will enhance or increase use of more than one of the

Scoring is based on number of other modes of travel enhanced:

- *No other modes enhanced = 0*
- *1 other mode enhanced = 1*
- *2 other modes enhanced = 2*
- *3 other modes enhanced = 3*

four primary travel modes (i.e., auto, bike, walk, and transit). For example, providing a fixed guideway transit system would increase the use of biking and walking to stations instead of someone driving the entire length of a trip. Hence, most transit projects will enhance two (2) other modes. Similarly, a bicycle pathway that will be constructed as a shared use path that allows for pedestrian travel would enhance one other mode. Roadway projects are generally expected to enhance one other mode (transit) in addition to benefiting auto travel. However, some roadway projects involving the construction of brand new facilities are expected to include separate bicycle and pedestrian facilities that would provide new connections for these modes; thus, they may receive a score of 2 or 3 in this category.

3.1.3 Contributes to Mode Share Goal

A key aspect of this study is the goal of reducing the proportion of single-occupant vehicle (SOV) trips to other modes including carpooling, bicycling, walking, and transit. While the ultimate goal is to reduce all types of trips, some of the greatest reductions can be accomplished by focusing on commute trips to work and school. For this criterion, projects that do not include the addition of vehicle capacity and also provide the highest quality facilities/services and benefit for non-auto-related modes received the highest score of 3. Projects receive a score of 2 if they provide additional medium quality capacity for transit, biking and walking; help to shift SOV trips to HOV trips; or include policies to reduce vehicle traffic.

The scale for this scoring is generally as follows:

- *High-capacity transit, bike path/ bikesharing, and Complete Streets projects = 3*
- *Bus transit, bike lane, HOV/HOT lane, TDM projects = 2*
- *New road with bike/ped facilities, bike route, ITS, and minor vehicle-focused projects = 1*
- *All other projects = 0*

These projects include bus transit projects (with lower capacities and higher travel times than rail transit), bike lanes (requiring mixing with traffic), HOV/HOT lane projects (still requiring auto travel), and TDM projects that incentivize the use of other modes and manage demand (but don't provide actual multi-modal facilities). Projects receive a score of 1 if they include the construction of a new road with bike/ped facilities (but still add new vehicle capacity), involve ITS, or include minor improvements focused on traffic operations. Projects that do not fall into any of the above-referenced categories receive a score of 0.

3.1.4 Potential to Reduce Vehicle Congestion

The primary goal of reducing single occupant vehicle travel in the COTS area notwithstanding, minimizing excessive traffic congestion is still a major focus for mobility studies that take a balanced approach to circulation. Reducing congestion helps to reduce greenhouse gas emissions, typically reduces collisions, stimulates economic activity and enhances quality of life by reducing commute times and wasted time in vehicles. This especially true in areas that currently experience lengthy peak period congestion every day such as Kamehameha Highway and H-2 in Waipio as these facilities merge with the H-1 freeway. Accordingly, projects that will provide additional roadway capacity were looked upon favorably in terms of minimizing delays, enhancing travel time reliability, and providing additional options for vehicular access.

The scale for this scoring is generally as follows:

- *New roadways providing areawide or regional benefit = 3*
- *High-capacity/high-quality transit projects = 2*
- *Projects that increase bus transit ridership or provide local vehicle capacity enhancements = 1*
- *Bicycle and pedestrian projects or Complete Streets projects = 0*

3.1.5 Enhanced Infrastructure Condition

A key issue for all public agencies is the on-going maintenance of existing transportation infrastructure and the dwindling resources available to adequately maintain facilities. The construction of brand new facilities generally adds to that burden, but the minor expansion of some existing facilities will help to extend the life of said infrastructure to varying degrees. In addition, new facilities or widenings also reduces the impact of vehicles on roadways by better distributing the traffic load. Some projects such a bridge rehabilitation are obviously the most effective in this regard, but other improvements such as repaving or resurfacing also contribute to enhancing the condition of infrastructure.

The scale for this scoring is generally as follows:

- **Rehabilitation-specific = 3**
- **Major resurfacing = 2**
- **New facilities that better distribute traffic = 1**
- **All other projects = 0**

3.1.6 Enhanced Safety

A substantial benefit from some projects is enhanced safety that will reduce the potential for collisions or minimizes the level of severity of a collision(s). These reductions could be across some or all modes depending on the project description.

With any mobility improvement, it is not possible to accurately predict the specific reduction in collisions or collision rate that might occur once that project has been constructed. However, improvements that are designed to industry standards typically have lower collision rates than those that are not. For purposes of assessing the safety benefit of each project, consideration was given to whether it would generally provide safer conditions from a collision perspective in terms of likelihood of occurrence, whether a roadway facility design would be improved over existing conditions, if separated bicycle or pedestrian paths would be provided where they do not currently exist, etc. The scoring for this potential benefit varies by mode as shown in **Table 4**.

Table 4. Safety Scoring by Mode

Score	Travel Mode			
	Roadway	Transit	Bicycling	Walking
3	New roadway that would reduce collision potential	Grade-separated system	Off-street or protected path	New sidewalk or path
2	Merging improvements	At-grade fixed guideway	On-street bicycle lanes	New crosswalk
1	New roadway that would reduce congestion	Increased bus ridership	N/A	N/A
0	No significant effect	No significant effect	No significant effect (e.g., bicycle route)	No significant effect

3.1.7 Deficiency Status

Another factor in determining the potential benefit of a project to the COTS area is the timing of the deficiency that the project is addressing. In some cases, projects may have several potential mobility-related benefits, but the need for an improvement is not immediate. For example, no safe and convenient bike path is currently available between Mililani and Central Oahu Regional Park, and Project 201.2 would construct such a facility. Thus, the need for this project is immediate or near-term because there is currently an unmet need. In contrast, the proposed Pineapple Road interchange (Project 404.1) is not needed until development in the Koa Ridge area has occurred near that location and could benefit from the new freeway access. This project will not be needed for some time, and can be classified as a long-term need. For purposes of this assessment, near term is defined to be needed within roughly a 1 to 2-year timeframe, mid-term is 3 to 5 years, and long-term is beyond 5 years.

The scale for this scoring is generally as follows:

- Near-term projects = 3
- Mid-term projects = 2
- Long-term projects = 1

3.2 Project Ranking

Once all of the potential benefits for each project were scored, the points for all benefits were totaled as shown in **Table 5**. This list includes projects listed in numerical order with the point total shown in the last column.

Next, the projects were then ranked individually from highest to lowest point total as shown in **Table 6**. For projects that include the same total number of points, they were further ranked by points under Area of Benefit first, followed by Number of Other Modes Enhanced second. For example, if two projects included a point total of 10, the project that provided an areawide benefit and enhanced three other modes would be ranked higher than a project which provided a local benefit that only enhanced one other mode.

Because some projects are significantly greater in scope and area of influence, the projects were also ranked in subgroups by travel mode as shown in **Table 7**. This helps to more directly compare projects within each mode category, where a bicycle facility might have a significant benefit to a single community and would encourage non-auto travel, but would be overshadowed by a new roadway connection or the widening of an arterial roadway that would provide substantially more vehicle capacity and potentially reduce congestion to some degree. The roadway project would clearly influence a greater number of users but would have limited to no effect on achieving the primary study goal of reducing the mode split for single occupant vehicles from 75% to 60% within the COTS area.

3.2.1 Highest Ranked Projects

The highest ranked projects based solely on point total are roadway projects primarily because of their influence on multiple categories, including areawide benefit, increase in vehicle capacity, and effect on freight. In fact, the top five projects are roadway projects.

The highest ranked project with a score of 17 is the improvement of the H-1/H-2 interchange (Project 405.1), but this would require additional downstream improvements on H-1 to provide a substantial congestion reduction as noted in its project evaluation in **Section 2.0**.

The second highest ranked project with a score of 16 is a new roadway between Mililani Mauka and Pearl City (Project 406.1). Providing an alternative to traveling on eastbound H-1 in the morning and a more direct connection between major communities would rank high in this exercise.

The third highest ranked project with a score of 13 is the widening of Kamehameha Highway to four lanes between Ka Uka Boulevard and Lanikuhana Avenue. This segment represents a bottleneck within the COTS area and is the primary link between the Waipio and Mililani communities. With the increased traffic generated to and from the Koa Ridge development within COTS, this connection should be enhanced to minimize congestion in the area.

The highest ranked non-roadway project is Project 303.3, which is Complete Streets modifications on priority roads. While this project does not have specific locations identified at this time, the modification of roadways to better accommodate other modes and better balance the mobility, access and safety needs of all users is paramount. Specific projects under this category will directly influence a traveler's choice of active modes and transit over a vehicle, again contributing to the primary study goal of reducing auto travel. It has been identified as primarily a pedestrian mode project type, but also improves mobility for bicyclists and transit patrons, and in many cases can provide additional parking spaces for vehicle travel and enhances vehicle safety. This project has a multi-modal objective for a package of projects; therefore, a single measure that favors automobile travel does not over rank other measures.

The highest ranked transit project is the installation of Mobility Hubs (Project 302.3). By providing focused mobility options in close proximity to a traveler's place of residence, place of employment and shopping/recreational opportunities, the demand for auto travel will be further reduced. These facilities will encourage the use of transit and address the varied mobility needs of COTS travelers through smaller investments than required for major roadway projects.

Of the new transit systems evaluated for the COTS area, three ranked equally with 10 points total: Projects 102.1 and 102.6 involve the use of HART rail technology and assume grade-separated systems on different alignments between the Pearl Highlands rail station and Wahiawa or Mililani, respectively; Project 102.8 involves the use of aerial gondola technology between the Mililani Park and Ride facility and Pearl Highlands and is expected to require a lower level of capital investment compared to rail technology. More detailed evaluation is needed to determine the optimal fixed guideway transit system in the COTS

area, but these projects also better achieve the study's mode shift goal as compared to the roadway projects described above.

The highest ranked bicycle project is a new shared-use pathway between Anania Drive and Central Oahu Regional Park. This facility would provide an attractive and convenient link between Mililani and a major recreational destination, as well as providing a safer path for bicycle commuters traveling between Mililani and communities makai of Kipapa Gulch. This path would have to be integrated within the Koa Ridge community and, because of topographic considerations, would have to be designed in such a way as to attract a broad range of users.

Table 5 shows the project scores by Project Number. **Table 6** ranks the projects by total points. **Table 7** ranks the projects by Primary Mode or Program (i.e., bicycle, pedestrian, roadway, transit, program). In **Table 7**, projects in all modes with a score of 10 or higher are highlighted.

Table 5. Projects Scored and Listed by Project Number

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
101.1	Bus Service Expansion including Stop/Shelter Conditions	Islandwide	T	3	2	1	0	1	2	2	11
101.2	Construct Transit Centers	Islandwide	T	3	2	1	0	1	2	2	11
101.3	City Operations & Maintenance	Islandwide	T	3	0	0	1	1	2	1	8
102.1	HART rail technology between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	1	2	3	13
102.2	Light Rail between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	0	2	3	12
102.3	Bus Rapid Transit between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	1	0	0	2	2	10
102.5	P & R with Flyer Stop in H-2 median mauka of Ka Uka Blvd	Central Oahu	T	3	2	1	0	0	2	1	9
102.6	HART rail technology between Mililani & Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	1	2	3	13
102.8	Aerial Gondola between Mililani Park n Ride & Pearl Highlands station	Central Oahu	T	3	2	2	0	1	2	3	13
201.1	New Pathway on Waipahu St between Paiwa St and Kamehameha Hwy	Waipahu	B	2	1	0	0	3	3	3	12
201.2	New Pathway between Anania Dr and Central Oahu Regional Park	Kipapa Gulch	B	3	1	0	0	3	3	3	13
201.4	New Bike Pathway along Kamehameha Hwy from Ka Uka Boulevard to Waipahu Street	Waipio	B	3	1	0	0	3	3	3	13
201.5	New Ped/Bike Path connecting Kam. Hwy at Waipahu Street to LCC Station	Leeward Community College	B	3	1	0	0	3	2	3	12
201.6	New Bike Pathway along Kamehameha Hwy. between Wahiawa and Anania Dr	Wahiawa	B	3	1	0	0	3	3	3	13
201.7	Bike Pathway on Cane Haul Road between H-2 & Pearl Highlands station	Pearl Highlands	B	3	1	0	0	3	2	3	12
201.8	Bicycle pathway through the H-2/Meheula Parkway Interchange	Mililani	B	3	1	0	0	3	3	3	13
201.10	Bike Pathway in Central Oahu Regional Park between Kamehameha Hwy and Paiwa St	Central Oahu Regional Park	B	3	1	0	0	3	2	3	12
202.1	Bicycle lanes on Ainamakua Dr between Mililani Park & Ride and Kualapa St	Mililani Mauka	B	2	0	0	0	2	2	2	8
202.3	Bicycle lanes on Meheula Parkway between Mililani H-2 Interchange and Kapanoe St	Mililani Mauka	B	2	0	0	0	2	2	2	8

Table 5. Projects Scored and Listed by Project Number (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
202.4	Bicycle lanes on Kuahelani Avenue between Hokuahiahi Park and Meheula Parkway	Mililani	B	3	0	0	0	2	2	2	9
202.6	Bicycle lanes on Kamehameha Highway from Waihona St connecting to Pearl Harbor Bike Path	Pearl City	B	3	0	0	0	2	2	2	9
203.1	Bicycle route on California Ave between Plum St and Iliahi Elementary	Wahiawa	B	1	0	0	0	0	1	1	3
203.3	Bicycle route on Leilehua Golf Course Rd between Kamehameha Hwy and Wikao St	Mililani	B	1	0	0	0	0	1	1	3
203.5	Bicycle route on Anania Dr between Meheula Pkwy and Kipapa Gulch Path	Mililani	B	1	0	0	0	0	1	1	3
203.6	Bicycle route on Lanikuhana Ave from South end of Meheula Pkwy to Mililani Shopping Center	Mililani	B	1	0	0	0	0	1	1	3
301.1	Crosswalk across makai leg of Kamehameha Hwy intersections at Olive and Avocado Streets	Wahiawa	P	2	0	0	0	2	3	2	9
302.1	Safe Routes to School	Islandwide	P	2	1	0	0	3	3	3	12
302.2	Pedestrian Crossing Safety	Islandwide	P	2	1	0	0	3	3	3	12
302.3	Mobility Hubs	COTS area	T	3	3	1	0	1	2	3	13
303.1	California Ave Complete Street between Kamehameha Hwy and Wahiawa District Park	Wahiawa	P	2	2	0	1	2	2	3	12
303.2	Kipapa Dr Complete Street between Hookelawaa St and Mililani Waena Elementary School	Mililani	P	2	2	0	1	2	2	3	12
303.3	Complete Streets modifications on priority roads	Central Oahu	P	3	2	0	1	3	2	3	14
401.1	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (freeway ramp widening & signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.2	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (freeway ramp approach widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.3	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St. (freeway ramp approach widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.4	Ka Uka Blvd & H-2 Northbound Off-Ramp to Limuana St (freeway ramp signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7

Table 5. Projects Scored and Listed by Project Number (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
401.5	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St (freeway ramp widening & signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.6	Ka Uka Blvd & H-2 Northbound Off-Ramp to Ka Uka Blvd (freeway ramp relocation & widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.7	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	R	2	1	2	1	0	2	0	8
401.8	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	R	2	1	2	1	0	2	0	8
401.9	Ka Uka Blvd & H-2 Flyover Ramp	Waipio Interchange	R	2	1	2	0	1	2	0	8
402.1	Ka Uka Blvd between Moaniani St and Commercial Driveway/ Spine Rd (lane addition)	Waipio	R	2	1	1	1	0	2	0	7
402.2	Ka Uka Blvd Intersection with Commercial Driveway/ Spine Rd (intersection lane & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
402.3	Ka Uka Blvd Intersection with Commercial Driveway/Spine Rd (intersection widening & modification)	Waipio	R	2	1	1	1	0	2	0	7
402.4	Ka Uka Blvd between H-2 and new development (new road)	Waipio	R	2	2	2	0	0	1	1	8
403.1	Kamehameha Hwy & Lumiaina St Intersection (intersection widening & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
403.2	Kamehameha Hwy & Waipahu St Intersection (intersection restriping & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
403.3	Kamehameha Hwy & Ka Uka Blvd Intersection (intersection widening)	Waipio	R	2	1	1	1	0	2	0	7
403.4	Kamehameha Hwy between Ka Uka Blvd and North of Ka Uka Blvd. (add NB lane)	Waipio	R	2	1	1	1	0	2	1	8
403.5	Kamehameha Hwy between Ka Uka Blvd and Lanikuhana (widen from 3 to 4 lanes)	Waipio to Mililani	R	3	2	2	1	0	3	1	12
403.7	Kamehameha Hwy Roosevelt Bridge (rehabilitation)	Kipapa Gulch	R	1	1	0	3	0	2	0	7
403.8	Kamehameha Hwy HOV lanes (Ka Uka Boulevard to Farrington Hwy)	COTS	R	3	1	2	1	0	1	2	10
404.1	H-2 & Pineapple Road Interchange	New Interchange	R	3	0	2	0	0	1	1	7
404.2	H-2 & Meheula Pkwy (widen on-ramp)	Mililani Mauka	R	2	0	1	1	0	2	0	6

Table 5. Projects Scored and Listed by Project Number (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							Point Total
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	
405.1	Waiawa H-1/H-2 Interchange Eastbound/ Southbound Merge Improvements	Waiawa Interchange	R	3	1	3	2	2	3	1	15
406.1	New Road between Mililani Mauka and Pearl City	Central Oahu	R	3	2	3	1	1	3	1	14
406.2	New Road between Whitmore Ave (SR 804) and California Ave	Wahiawa	R	2	3	1	1	0	1	1	9
406.3	New Road between California Ave and Meheula Pkwy	Wahiawa	R	3	3	2	1	0	1	1	11
408.1	New H-2 Interchange serving Mililani Mauka	Mililani Mauka	R	3	3	2	0	0	2	0	10
408.4	New flyer stops at H-2 with pedestrian pathway to P & R	Mililani Mauka	R	2	2	0	0	1	2	1	8
501.1	Free real-time online carpool matching	Islandwide	Pr	1	0	1	0	0	2	2	6
501.2	Outreach promotion and marketing of alternative transportation	Islandwide	Pr	1	3	1	0	0	2	2	9
501.3	Emergency ride home program	Islandwide	Pr	1	3	1	0	0	2	2	9
501.5	Employer based commuter/parking programs	Islandwide	Pr	1	3	1	0	0	2	2	9
501.6	Emerging and innovative strategies - Carsharing	Islandwide	Pr	1	0	1	0	0	2	1	5
501.7	Emerging and innovative strategies - Bikesharing	Islandwide	Pr	1	0	1	0	0	2	3	7
501.8	Vanpool program	Islandwide	Pr	1	1	1	0	0	2	2	7
501.9	Support of working from home	Islandwide	Pr	1	1	1	0	0	2	2	7
501.1	Support of alternate/shifted work hours	Islandwide	Pr	1	1	1	0	0	2	2	7
502.1	ITS (Real-time traffic info, dynamic signage, adaptive signals, etc.)	Islandwide	R	1	1	2	0	2	3	1	10
601.2	HOT lanes	Central Oahu/ Islandwide	R	3	1	3	0	1	2	2	12
601.3	Parking Strategies	Central Oahu/ Islandwide	Pr	1	3	1	0	1	2	2	10

Table 6. Projects Ranked by Total Points

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
405.1	Waiawa H-1/H-2 Interchange Eastbound/Southbound Merge Improvements	Waiawa Interchange	R	3	1	3	2	2	3	1	15
303.3	Complete Streets modifications on priority roads	Central Oahu	P	3	2	0	1	3	2	3	14
406.1	New Road between Mililani Mauka and Pearl City	Central Oahu	R	3	2	3	1	1	3	1	14
302.3	Mobility Hubs	COTS area	T	3	3	1	0	1	2	3	13
102.1	HART rail technology between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	1	2	3	13
102.6	HART rail technology between Mililani & Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	1	2	3	13
102.8	Aerial Gondola between Mililani Park n Ride & Pearl Highlands station	Central Oahu	T	3	2	2	0	1	2	3	13
201.2	New Pathway between Anania Dr and Central Oahu Regional Park	Kipapa Gulch	B	3	1	0	0	3	3	3	13
201.4	New Bike Pathway along Kamehameha Hwy from Ka Uka Boulevard to Waipahu Street	Waipio	B	3	1	0	0	3	3	3	13
201.6	New Bike Pathway along Kamehameha Hwy. between Wahiawa and Anania Dr	Wahiawa	B	3	1	0	0	3	3	3	13
201.8	Bicycle pathway through the H-2/Meheula Parkway Interchange	Mililani	B	3	1	0	0	3	3	3	13
303.1	California Ave Complete Street between Kamehameha Hwy and Wahiawa District Park	Wahiawa	P	2	2	0	1	2	2	3	12
303.2	Kipapa Dr Complete Street between Hookelawaa St and Mililani Waena Elementary School	Mililani	P	2	2	0	1	2	2	3	12
102.2	Light Rail between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	0	2	3	12
403.5	Kamehameha Hwy between Ka Uka Blvd and Lanikuhana (widen from 3 to 4 lanes)	Waipio to Mililani	R	3	2	2	1	0	3	1	12

Table 6. Projects Ranked by Total Points (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
201.5	New Ped/Bike Path connecting Kam. Hwy at Waipahu Street to LCC Station	Leeward Community College	B	3	1	0	0	3	2	3	12
201.7	Bike Pathway on Cane Haul Road between H-2 & Pearl Highlands station	Pearl Highlands	B	3	1	0	0	3	2	3	12
201.10	Bike Pathway in Central Oahu Regional Park between Kamehameha Hwy and Paiwa St	Central Oahu Regional Park	B	3	1	0	0	3	2	3	12
601.2	HOT lanes	Central Oahu/ Islandwide	R	3	1	3	0	1	2	2	12
201.1	New Pathway on Waipahu St between Paiwa St and Kamehameha Hwy	Waipahu	B	2	1	0	0	3	3	3	12
302.1	Safe Routes to School	Islandwide	P	2	1	0	0	3	3	3	12
302.2	Pedestrian Crossing Safety	Islandwide	P	2	1	0	0	3	3	3	12
406.3	New Road between California Ave and Meheula Pkwy	Wahiawa	R	3	3	2	1	0	1	1	11
101.1	Bus Service Expansion including Stop/Shelter Conditions	Islandwide	T	3	2	1	0	1	2	2	11
101.2	Construct Transit Centers	Islandwide	T	3	2	1	0	1	2	2	11
408.1	New H-2 Interchange serving Mililani Mauka	Mililani Mauka	R	3	3	2	0	0	2	0	10
102.3	Bus Rapid Transit between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	1	0	0	2	2	10
403.8	Kamehameha Hwy HOV lanes (Ka Uka Boulevard to Farrington Hwy)	COTS	R	3	1	2	1	0	1	2	10
601.3	Parking Strategies	Central Oahu/ Islandwide	Pr	1	3	1	0	1	2	2	10
502.1	ITS (Real-time traffic info, dynamic signage, adaptive signals, etc.)	Islandwide	R	1	1	2	0	2	3	1	10

Table 6. Projects Ranked by Total Points (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
102.5	P & R with Flyer Stop in H-2 median mauka of Ka Uka Blvd	Central Oahu	T	3	2	1	0	0	2	1	9
202.4	Bicycle lanes on Kuahelani Avenue between Hokuahiahi Park and Meheula Parkway	Mililani	B	3	0	0	0	2	2	2	9
202.6	Bicycle lanes on Kamehameha Highway from Waihona St connecting to Pearl Harbor Bike Path	Pearl City	B	3	0	0	0	2	2	2	9
406.2	New Road between Whitmore Ave (SR 804) and California Ave	Wahiawa	R	2	3	1	1	0	1	1	9
301.1	Crosswalk across makai leg of Kamehameha Hwy intersections at Olive and Avocado Streets	Wahiawa	P	2	0	0	0	2	3	2	9
501.2	Outreach promotion and marketing of alternative transportation	Islandwide	Pr	1	3	1	0	0	2	2	9
501.3	Emergency ride home program	Islandwide	Pr	1	3	1	0	0	2	2	9
501.5	Employer based commuter/parking programs	Islandwide	Pr	1	3	1	0	0	2	2	9
101.3	City Operations & Maintenance	Islandwide	T	3	0	0	1	1	2	1	8
402.4	Ka Uka Blvd between H-2 and new development (new road)	Waipio	R	2	2	2	0	0	1	1	8
408.4	New flyer stops at H-2 with pedestrian pathway to P & R	Mililani Mauka	R	2	2	0	0	1	2	1	8
401.7	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	R	2	1	2	1	0	2	0	8
401.8	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	R	2	1	2	1	0	2	0	8
401.9	Ka Uka Blvd & H-2 Flyover Ramp	Waipio Interchange	R	2	1	2	0	1	2	0	8
403.4	Kamehameha Hwy between Ka Uka Blvd and North of Ka Uka Blvd. (add NB lane)	Waipio	R	2	1	1	1	0	2	1	8
202.1	Bicycle lanes on Ainamakua Dr between Mililani Park & Ride and Kualapa St	Mililani Mauka	B	2	0	0	0	2	2	2	8

Table 6. Projects Ranked by Total Points (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
202.3	Bicycle lanes on Meheula Parkway between Mililani H-2 Interchange and Kapanoe St	Mililani Mauka	B	2	0	0	0	2	2	2	8
404.1	H-2 & Pineapple Road Interchange	New Interchange	R	3	0	2	0	0	1	1	7
401.1	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (freeway ramp widening & signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.2	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (freeway ramp approach widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.3	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St. (freeway ramp approach widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.4	Ka Uka Blvd & H-2 Northbound Off-Ramp to Limuana St (freeway ramp signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.5	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St (freeway ramp widening & signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.6	Ka Uka Blvd & H-2 Northbound Off-Ramp to Ka Uka Blvd (freeway ramp relocation & widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
402.1	Ka Uka Blvd between Moaniani St and Commercial Driveway/ Spine Rd (lane addition)	Waipio	R	2	1	1	1	0	2	0	7
402.2	Ka Uka Blvd Intersection with Commercial Driveway/ Spine Rd (intersection lane & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
402.3	Ka Uka Blvd Intersection with Commercial Driveway/Spine Rd (intersection widening & modification)	Waipio	R	2	1	1	1	0	2	0	7
403.1	Kamehameha Hwy & Lumiaina St Intersection (intersection widening & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
403.2	Kamehameha Hwy & Waipahu St Intersection (intersection restriping & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
403.3	Kamehameha Hwy & Ka Uka Blvd Intersection (intersection widening)	Waipio	R	2	1	1	1	0	2	0	7

Table 6. Projects Ranked by Total Points (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
403.7	Kamehameha Hwy Roosevelt Bridge (rehabilitation)	Kipapa Gulch	R	1	1	0	3	0	2	0	7
501.8	Vanpool program	Islandwide	Pr	1	1	1	0	0	2	2	7
501.9	Support of working from home	Islandwide	Pr	1	1	1	0	0	2	2	7
501.1	Support of alternate/shifted work hours	Islandwide	Pr	1	1	1	0	0	2	2	7
501.7	Emerging and innovative strategies - Bikesharing	Islandwide	Pr	1	0	1	0	0	2	3	7
404.2	H-2 & Meheula Pkwy (widen on-ramp)	Mililani Mauka	R	2	0	1	1	0	2	0	6
501.1	Free real-time online carpool matching	Islandwide	Pr	1	0	1	0	0	2	2	6
501.6	Emerging and innovative strategies - Carsharing	Islandwide	Pr	1	0	1	0	0	2	1	5
203.1	Bicycle route on California Ave between Plum St and Iliahi Elementary	Wahiawa	B	1	0	0	0	0	1	1	3
203.3	Bicycle route on Leilehua Golf Course Rd between Kamehameha Hwy and Wikao St	Mililani	B	1	0	0	0	0	1	1	3
203.5	Bicycle route on Anania Dr between Meheula Pkwy and Kipapa Gulch Path	Mililani	B	1	0	0	0	0	1	1	3
203.6	Bicycle route on Lanikuhana Ave from South end of Meheula Pkwy to Mililani Shopping Center	Mililani	B	1	0	0	0	0	1	1	3

Table 7. Projects Ranked by Total Points by Mode

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
BICYCLE PROJECTS											
201.2	New Pathway between Anania Dr and Central Oahu Regional Park	Kipapa Gulch	B	3	1	0	0	3	3	3	13
201.4	New Bike Pathway along Kamehameha Hwy from Ka Uka Boulevard to Waipahu Street	Waipio	B	3	1	0	0	3	3	3	13
201.6	New Bike Pathway along Kamehameha Hwy. between Wahiawa and Anania Dr	Wahiawa	B	3	1	0	0	3	3	3	13
201.8	Bicycle pathway through the H-2/Meheula Parkway Interchange	Mililani	B	3	1	0	0	3	3	3	13
201.5	New Ped/Bike Path connecting Kam. Hwy at Waipahu Street to LCC Station	Leeward Community College	B	3	1	0	0	3	2	3	12
201.7	Bike Pathway on Cane Haul Road between H-2 & Pearl Highlands station	Pearl Highlands	B	3	1	0	0	3	2	3	12
201.10	Bike Pathway in Central Oahu Regional Park between Kamehameha Hwy and Paiwa St	Central Oahu Regional Park	B	3	1	0	0	3	2	3	12
201.1	New Pathway on Waipahu St between Paiwa St and Kamehameha Hwy	Waipahu	B	2	1	0	0	3	3	3	12
202.4	Bicycle lanes on Kuahelani Avenue between Hokuahiahi Park and Meheula Parkway	Mililani	B	3	0	0	0	2	2	2	9
202.6	Bicycle lanes on Kamehameha Highway from Waihona St connecting to Pearl Harbor Bike Path	Pearl City	B	3	0	0	0	2	2	2	9
202.1	Bicycle lanes on Ainamakua Dr between Mililani Park & Ride and Kualapa St	Mililani Mauka	B	2	0	0	0	2	2	2	8
202.3	Bicycle lanes on Meheula Parkway between Mililani H-2 Interchange and Kapanoe St	Mililani Mauka	B	2	0	0	0	2	2	2	8
203.1	Bicycle route on California Ave between Plum St and Iliahi Elementary	Wahiawa	B	1	0	0	0	0	1	1	3
203.3	Bicycle route on Leilehua Golf Course Rd between Kamehameha Hwy and Wikao St	Mililani	B	1	0	0	0	0	1	1	3

Table 7. Projects Ranked by Total Points by Mode (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
203.5	Bicycle route on Anania Dr between Meheula Pkwy and Kipapa Gulch Path	Mililani	B	1	0	0	0	0	1	1	3
203.6	Bicycle route on Lanikuhana Ave from South end of Meheula Pkwy to Mililani Shopping Center	Mililani	B	1	0	0	0	0	1	1	3
PEDESTRIAN PROJECTS											
303.3	Complete Streets modifications on priority roads	Central Oahu	P	3	2	0	1	3	2	3	14
303.1	California Ave Complete Street between Kamehameha Hwy and Wahiawa District Park	Wahiawa	P	2	2	0	1	2	2	3	12
303.2	Kipapa Dr Complete Street between Hookelawaa St and Mililani Waena Elementary School	Mililani	P	2	2	0	1	2	2	3	12
302.1	Safe Routes to School	Islandwide	P	2	1	0	0	3	3	3	12
302.2	Pedestrian Crossing Safety	Islandwide	P	2	1	0	0	3	3	3	12
301.1	Crosswalk across makai leg of Kamehameha Hwy intersections at Olive and Avocado Streets	Wahiawa	P	2	0	0	0	2	3	2	9
PROGRAMS											
601.3	Parking Strategies	Central Oahu/ Islandwide	Pr	1	3	1	0	1	2	2	10
501.2	Outreach promotion and marketing of alternative transportation	Islandwide	Pr	1	3	1	0	0	2	2	9
501.3	Emergency ride home program	Islandwide	Pr	1	3	1	0	0	2	2	9
501.5	Employer based commuter/parking programs	Islandwide	Pr	1	3	1	0	0	2	2	9
501.8	Vanpool program	Islandwide	Pr	1	1	1	0	0	2	2	7
501.9	Support of working from home	Islandwide	Pr	1	1	1	0	0	2	2	7
501.1	Support of alternate/shifted work hours	Islandwide	Pr	1	1	1	0	0	2	2	7

Table 7. Projects Ranked by Total Points by Mode (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
501.7	Emerging and innovative strategies - Bikesharing	Islandwide	Pr	1	0	1	0	0	2	3	7
501.1	Free real-time online carpool matching	Islandwide	Pr	1	0	1	0	0	2	2	6
501.6	Emerging and innovative strategies - Carsharing	Islandwide	Pr	1	0	1	0	0	2	1	5
ROADWAY											
405.1	Waiawa H-1/H-2 Interchange Eastbound/Southbound Merge Improvements	Waiawa Interchange	R	3	1	3	2	2	3	1	15
406.1	New Road between Mililani Mauka and Pearl City	Central Oahu	R	3	2	3	1	1	3	1	14
403.5	Kamehameha Hwy between Ka Uka Blvd and Lanikuhana (widen from 3 to 4 lanes)	Waipio to Mililani	R	3	2	2	1	0	3	1	12
601.2	HOT lanes	Central Oahu/ Islandwide	R	3	1	3	0	1	2	2	12
406.3	New Road between California Ave and Meheula Pkwy	Wahiawa	R	3	3	2	1	0	1	1	11
408.1	New H-2 Interchange serving Mililani Mauka	Mililani Mauka	R	3	3	2	0	0	2	0	10
403.8	Kamehameha Hwy HOV lanes (Ka Uka Boulevard to Farrington Hwy)	COTS	R	3	1	2	1	0	1	2	10
502.1	ITS (Real-time traffic info, dynamic signage, adaptive signals, etc.)	Islandwide	R	1	1	2	0	2	3	1	10
406.2	New Road between Whitmore Ave (SR 804) and California Ave	Wahiawa	R	2	3	1	1	0	1	1	9
402.4	Ka Uka Blvd between H-2 and new development (new road)	Waipio	R	2	2	2	0	0	1	1	8
408.4	New flyer stops at H-2 with pedestrian pathway to P & R	Mililani Mauka	R	2	2	0	0	1	2	1	8
401.7	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	R	2	1	2	1	0	2	0	8

Table 7. Projects Ranked by Total Points by Mode (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
401.8	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (new freeway ramp & overpass widening)	Waipio Interchange	R	2	1	2	1	0	2	0	8
401.9	Ka Uka Blvd & H-2 Flyover Ramp	Waipio Interchange	R	2	1	2	0	1	2	0	8
403.4	Kamehameha Hwy between Ka Uka Blvd and North of Ka Uka Blvd. (add NB lane)	Waipio	R	2	1	1	1	0	2	1	8
404.1	H-2 & Pineapple Road Interchange	New Interchange	R	3	0	2	0	0	1	1	7
401.1	Ka Uka Blvd & H-2 Northbound On-Ramp to H-2 (freeway ramp widening & signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.2	Ka Uka Blvd & H-2 Southbound On-Ramp to H-2 (freeway ramp approach widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.3	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St. (freeway ramp approach widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.4	Ka Uka Blvd & H-2 Northbound Off-Ramp to Limuana St (freeway ramp signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.5	Ka Uka Blvd & H-2 Southbound Off-Ramp to Ka Uka Blvd / Moaniani St (freeway ramp widening & signal modification)	Waipio Interchange	R	2	1	1	1	0	2	0	7
401.6	Ka Uka Blvd & H-2 Northbound Off-Ramp to Ka Uka Blvd (freeway ramp relocation & widening)	Waipio Interchange	R	2	1	1	1	0	2	0	7
402.1	Ka Uka Blvd between Moaniani St and Commercial Driveway/ Spine Rd (lane addition)	Waipio	R	2	1	1	1	0	2	0	7
402.2	Ka Uka Blvd Intersection with Commercial Driveway/ Spine Rd (intersection lane & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
402.3	Ka Uka Blvd Intersection with Commercial Driveway/Spine Rd (intersection widening & modification)	Waipio	R	2	1	1	1	0	2	0	7
403.1	Kamehameha Hwy & Lumiaina St Intersection (intersection widening & signal modification)	Waipio	R	2	1	1	1	0	2	0	7

Table 7. Projects Ranked by Total Points by Mode (cont.)

PROJECT TITLE		General Location	Primary Mode or Program: B = Bicycle P = Pedestrian R = Roadway T = Transit Pr = Program	Potential COTS Benefit							
Number	Description			Areawide = 3 Local = 2 Program = 1	Number of Other Modes Enhanced	Potential to Reduce Vehicle Congestion Low = 0 High =3	Infrastructure Condition Low = 0 High =3	Safety Low = 0 High =3	Deficiency Status Near-Term = 3 Mid-Term = 2 Long-Term =1	Contributes to Mode Share Goal Low = 0 High = 3	Point Total
403.2	Kamehameha Hwy & Waipahu St Intersection (intersection restriping & signal modification)	Waipio	R	2	1	1	1	0	2	0	7
403.3	Kamehameha Hwy & Ka Uka Blvd Intersection (intersection widening)	Waipio	R	2	1	1	1	0	2	0	7
403.7	Kamehameha Hwy Roosevelt Bridge (rehabilitation)	Kipapa Gulch	R	1	1	0	3	0	2	0	7
404.2	H-2 & Meheula Pkwy(widen on-ramp)	Mililani Mauka	R	2	0	1	1	0	2	0	6
TRANSIT											
302.3	Mobility Hubs	COTS area	T	3	3	1	0	1	2	3	13
102.1	HART rail technology between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	1	2	3	13
102.6	HART rail technology between Mililani & Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	1	2	3	13
102.8	Aerial Gondola between Mililani Park n Ride & Pearl Highlands station	Central Oahu	T	3	2	2	0	1	2	3	13
102.2	Light Rail between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	2	0	0	2	3	12
101.1	Bus Service Expansion including Stop/Shelter Conditions	Islandwide	T	3	2	1	0	1	2	2	11
101.2	Construct Transit Centers	Islandwide	T	3	2	1	0	1	2	2	11
102.3	Bus Rapid Transit between Wahiawa and Pearl Highlands Rail Station	Central Oahu	T	3	2	1	0	0	2	2	10
102.5	P & R with Flyer Stop in H-2 median mauka of Ka Uka Blvd	Central Oahu	T	3	2	1	0	0	2	1	9
101.3	City Operations & Maintenance	Islandwide	T	3	0	0	1	1	2	1	8

4.0 NEXT STEPS

A mid-project Public Information Meeting is scheduled for November 16, 2017 to update the public on the status of the project and receive feedback on the projects recommended for further evaluation.

The next step in the COTS process is to conduct a more detailed evaluation of the projects against the series of quantitative and qualitative performance metrics that were established in Deliverable B-2 of this project. These include specific metrics such as The 71 projects remaining after the initial assessment in **Section 2.0** and scoring and ranking in **Section 3.0** will also be reviewed for cost, constructability, ROW requirements, and ease of implementation. The following Deliverables will be prepared:

- **Deliverable F:** Documents the criteria for feasibility and sustainability assumptions, impacts by Performance Measure, identification of environmental impacts and mitigations, and assumptions for implementation.
- **Deliverable G:** Documents the financial assumptions and costs, as well as the benefits and costs of the alternatives.
- **Deliverable H:** Reports on the Prioritization and Recommendations for Implementation and will summarize and prioritize strategies, identify recommendations, identify impacts of no implementation, recommend an implementation timeframe, and identify any impacts is not accomplished within the recommended timeframe.

A final Public Information Meeting will be held upon the completion of the detailed evaluation of projects and the determination of the priorities, strategies, and recommendations for implementation.

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5.0 RESOURCES

The following resources were utilized to rank the potential projects:

- *2040 Regional Travel Demand Model (Base Year and Future Year Models)*, Oahu Metropolitan Planning Organization.
- *Oahu Regional Transportation Plans (2025 and 2040)*, Oahu Metropolitan Planning Organization.
- *Koa Ridge Makai and Waiea Development: Final Environmental Impact Statement* (April 2009), Helbert Hastert and Fee.
- *Report on the Feasibility of An Alternate Route of Ingress and Egress from Mililani Mauka: Report to the State Legislature* (November 2006), Oahu Metropolitan Planning Organization.
- *Central Oahu Sustainable Communities Plan: Public Review Draft* (January 2015), City & County of Honolulu Department of Planning and Permitting.
- *Final Alternative Scenarios Summary Report Oahu Regional Transportation Plan 2035 Project Deliverable 9.2.2* (December 2010), Oahu Metropolitan Planning Organization.
- *Honolulu Complete Street Implementation Study Location Report: California Avenue from Kamehameha Highway to Wahiawa District Park (FINAL)*, (June 2015), City & County of Honolulu Department of Transportation Services.
- *Honolulu Complete Street Implementation Study Location Report: Kipapa Drive at Mililani Waena Elementary School (FINAL)*, (March 2015), City & County of Honolulu Department of Transportation Services.
- *Center for Accelerating Innovation*, U.S. Department of Transportation Federal Highways Administration, (<https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/asct.cfm>)
- *Impact of Carsharing on Household Vehicle Holdings*; Elliot Martin, Susan A. Shaheen and Jeffrey Lidicker; Transportation Research Record: Journal of the transportation Research Board, No. 2143; 2010; pages 150-158.

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APPENDIX A

Detailed Performance Evaluation Matrix

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List of Potential COTS Projects (page 1 of 3)

Project Number	Project Description	General Location	Source	Recommend for Deletion	Applicable Performance Measures	Performance Measure																				
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
TRANSIT PROJECTS						Baseline: AM 56 mi PM 64 mi																				
101.0 GENERAL																										
101.1	Bus Service Expansion	Islandwide	1,2,3,6		2,6																					
101.2	Construct Transit Centers	Islandwide	1,2,3,6		2,6																					
101.3	City Operations & Maintenance including Stop/Shelter Conditions	Islandwide	1,2,3,6		N/A																					
101.4	Human Services Transportation Coordination Program	Islandwide	1,2,3,6	Y	N/A																					
102.0 HIGH CAPACITY TRANSIT																										
102.1	HART rail technology between Wahiawa and Pearl Highlands Rail Station	Central Oahu	1,3,6		2,6,7,11																					
102.2	Light Rail between Wahiawa and Pearl Highlands Rail Station	Central Oahu	1,6		2,6,7,11																					
102.3	Bus Rapid Transit between Wahiawa and Pearl Highlands Rail Station	Central Oahu	1,4,6		2,6,7,11																					
102.4	Flyer Stops between Wahiawa and Pearl Highlands Rail Station	Central Oahu	1,6	Y	2,6,7,11																					
102.5	P & R with Flyer Stop in H-2 median mauka of Ka Uka Blvd	Central Oahu	7		2,6,7,11																					
102.6	HART rail technology between Mililani & Pearl Highlands Rail Station	Central Oahu	8		2,6,7,11																					
102.7	Aerial Gondola between Waipio & Wahiawa	Central Oahu	8	Y	2,6,7,11																					
102.8	Aerial Gondola between Mililani Park n Ride & Pearl Highlands station	Central Oahu	8	Modified	2,6,7,11																					
BICYCLE PROJECTS																										
201.0 BICYCLE PATHS																										
201.1	New Pathway on Waipahu St between Paiwa St and Kamehameha Hwy	Waipahu	1, 3, 4, 6		5,7,8,9,10,11,14,16,19																					
201.2	New Pathway between Anania Dr and Central Oahu Regional Park	Kipapa Gulch	1, 3, 4, 6		5,7,8,9,10,11,14,16,19																					
201.3	New Direct Kipapa Gulch Bike Bridge and Pathway	Kipapa Gulch	8	Y - duplicate of 201.2	5,7,8,9,10,11,14,16,19																					
201.4	New Bike Pathway along Kamehameha Hwy from Ka Uka Boulevard to Waipahu Street	Waipio	7		5,7,8,9,10,11,14,16,19																					
201.5	New Ped/Bike Path connecting Kam. Hwy at Waipahu Street to LCC Station	Leeward Community College	8	Modified	5,7,8,9,10,11,14,16,19																					
201.6	New Bike Pathway along Kamehameha Hwy. between Wahiawa and Anania Dr	Wahiawa	7		5,7,8,9,10,11,14,16,19																					
201.7	Bike Pathway on Cane Haul Road between H-2 & Pearl Highlands station	Pearl Highlands	8		5,7,8,9,10,11,14,16,19																					
201.8	Bicycle pathway infrastructure through the H-2/Meheula Parkway Interchange	Mililani	8		5,7,8,9,10,11,14,16,19																					
201.9	Bike Pathway along California Ave. between. Kilea Pl. and Nonohe St	Wahiawa	8	Y - Infeasible and alternate improvements available	5,7,8,9,10,11,14,16,19																					
201.1	Bike Pathway in Central Oahu Regional Park between Kamehameha Hwy and Paiwa St	Central Oahu Regional Park	6		5,7,8,9,10,11,14,16,19																					
202.0 BICYCLE LANES																										
202.1	Bicycle lanes on Ainamakua Dr between Mililani Park & Ride and Kualapa St	Mililani Mauka	1, 3, 4, 6		5,9,10,11,14,16,19																					
202.2	Bicycle lanes on Meheula Parkway through Mililani H-2 Interchange	Mililani	1, 2, 3, 4, 6	Y - duplicate of 201.8	5,9,10,11,14,16,19																					
202.3	Bicycle lanes on Meheula Parkway between Mililani H-2 Interchange and Kapanoe St	Mililani Mauka	1, 2, 3, 4, 6		5,9,10,11,14,16,19																					
202.4	Bicycle lanes on Kuahelani Avenue between Hokuahiahi Park and Meheula Parkway	Mililani	1, 3, 4, 6		5,9,10,11,14,16,19																					
202.5	Bicycle lanes on Kamehameha Highway between H-1 and H-2	Waiawa Interchange	1, 2, 3, 4, 6	Y - duplicate of 201.7	5,9,10,11,14,16,19																					
202.6	Bicycle lanes on Kamehameha Highway from Waihona St connecting to Pearl Harbor Bike Path	Pearl City	6		5,9,10,11,14,16,19																					
203.0 BICYCLE ROUTES																										
203.1	Bicycle route on California Ave between Plum St and Iliahi Elementary	Wahiawa	1, 6		9,10,11,19																					
203.2	Bicycle route on Kunia Rd btwn Anonui St and Wilikina Dr	Wahiawa	6	Y - limited benefit and mostly outside study area	9,10,11,19																					
203.3	Bicycle route on Leilehua Golf Course Rd between Kamehameha Hwy and Wikao St	Mililani	6		9,10,11,19																					
203.4	Bicycle route on Kamehameha Highway between Haleiwa Bypass and Kuahelani Ave	Wahiawa/Mililani	1, 6	Y - limited benefit and increased demand potential	9,10,11,19																					
203.5	Bicycle route on Anania Dr between Meheula Pkwy and Kipapa Gulch Path	Mililani	3		9,10,11,19																					
203.6	Bicycle route on Lanikuhana Ave from South end of Meheula Pkwy to Mililani Shopping Center	Mililani	1		9,10,11,19																					
203.7	Bicycle route on Kamehameha Hwy between Waipio Uka St and Waipahu St	Waipio	6	Y - less effective than Project 201.4	9,10,11,19																					

List of Potential COTS Projects (page 3 of 3)

Project Number	Project Description	General Location	Source	Recommend for Deletion	Applicable Performance Measures	Performance Measure																				
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
404.0 H-2 INTERCHANGES																										
404.1	H-2 & Pineapple Road Interchange	New Interchange	1, 3, 5		1,2,3,4,11																					
404.2	H-2 & Meheula Pkwy (widen on-ramp)	Mililani Mauka	6		1,2,3,4,11	LCC = 0 mins Kapolei = +1 mins PUC = +1 mins UH = +1 mins																				
404.3	H-2 & Kamehameha Hwy (widen on-ramp)	Wahiawa	7	Y	1,2,3,4,11	LCC = 0 mins Kapolei = 0 mins PUC = 0 mins UH = 0 mins																				
405.0 H-1 & H-2 INTERCHANGE																										
405.1	Waiawa H-1/H-2 Interchange Eastbound/Southbound Merge Improvements	Waiawa Interchange	1, 3, 5		1,2,3,4,11	LCC = 0 mins Kapolei = +1 mins PUC = +1 mins UH = +1 mins																				
406.0 CENTRAL MAUKA ROADS																										
406.1	New Road between Mililani Mauka and Pearl City	Central Oahu	4, 6		1,2,3,11	LCC = -4 mins Kapolei = -3 mins PUC = -6 mins UH = -6 mins																				
406.2	New Road between Whitmore Ave (SR 804) and California Ave	Wahiawa	4, 6		1,2,3,4,11	LCC = 0 mins Kapolei = 0 mins PUC = 0 mins UH = 0 mins																				
406.3	New Road between California Ave and Meheula Pkwy	Wahiawa	1, 4, 6		1,2,3,4,11	LCC = 0 mins Kapolei = 0 mins PUC = 0 mins UH = 0 mins																				
407.0 PAIWA EXTENSION																										
407.1	Extend Paiwa St from north of Lumiaina St to Kamehameha Hwy/Ka Uka Blvd intersection	Central Oahu	1,6		1,2,4,11	LCC = +9 mins Kapolei = +4 mins PUC = +11 mins UH = +11 mins																				
408.0 MILILANI ACCESS																										
408.1	New H-2 Interchange serving Mililani Mauka	Mililani Mauka	6		1,2,3,11	LCC = -1 mins Kapolei = -2 mins PUC = -2 mins UH = -2 mins																				
408.2	New road from Wikao St to P & R	Mililani Mauka	8	Y - low demand	2,4,11																					
408.3	New road between H-2 and P & R	Mililani Mauka	8	Y - infeasible	2,4,11																					
408.4	New flyer stops at H-2 with pedestrian pathway to P & R	Waipio	7		5,8,10,11																					
TRANSPORTATION DEMAND MANAGEMENT PROJECTS																										
501.0 TRANSPORTATION DEMAND MANAGEMENT																										
501.1	Free real-time online carpool matching	Islandwide	3, 4		7,11																					
501.2	Outreach promotion and marketing of alternative transportation	Islandwide	3, 4		7,11																					
501.3	Emergency ride home program	Islandwide	3, 4		7,11																					
501.4	Major special events	Islandwide	3, 4	Y	7,11																					
501.5	Employer based commuter/parking programs	Islandwide	3, 4		7,11																					
501.6	Emerging and innovative strategies - Carsharing	Islandwide	3, 4		7,11																					
501.7	Emerging and innovative strategies - Bikeshearing	Islandwide	7		7,11																					
501.8	Vanpool program	Islandwide	3, 4		7,11																					
501.9	Support of working from home	Islandwide	7		7,11																					
501.10	Support of alternate/shifted work hours	Islandwide	7		7,11																					
INTELLIGENT TRANSPORTATION SYSTEM PROJECTS																										
502.0 ITS																										
502.1	ITS (Real-time traffic info, dynamic signage, adaptive signals, etc.)	Islandwide	3,4		1,2																					
PRICING PROJECTS																										
601.0 PRICING																										
601.1	Congestion pricing/ramp metering on H-1 or H-2	Central Oahu/ Islandwide	7,8	Y	11																					
601.2	HOT lanes	Central Oahu/ Islandwide	7,8		11																					
601.3	Parking Strategies	Central Oahu/ Islandwide	7,8		11																					

Source: 1. Central Oahu Sustainable Communities Plan 2016
 2. Central Oahu Sustainable Communities Plan 2002
 3. Oahu Regional Transportation Plan 2040
 4. Transportation for Oahu Plan 2025
 5. Koa Ridge Traffic Impact Analysis Report
 6. Other Study
 7. Added by Project Team
 8. Added by Public

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APPENDIX B

State of Hawaii Roosevelt Bridge Inspection Report

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
NATIONAL BRIDGE ELEMENT
FINAL INSPECTION REPORT

Date of Inspection: October 06, 2015

Bridge Number: 003000990301447

Bridge Name: KIPAPA STRM

District Oahu

Route No: 00099

Milepost: 14

Facility: KAM HWY

NBI ITEM 36 - TRAFFIC SAFETY FEATURES		List any maintenance work required: (ie: defects, missing bolts, collision damage, etc.)
36A	Bridge Railings	Transitions Meet Standards
36B	Transitions	
36C	Approach Guardrail	
36D	Approach Guardrail Ends	

ELEMENT INSPECTION								
ELEM NO.	ELEMENT / DEFECT DESCRIPTION	ENV.	TOTAL QUANTITY	UNIT	CS 1 (Good)	CS 2 (Fair)	CS 3 (Poor)	CS 4 (Severe)
DEFECT								
12	Re Concrete Deck	1	17,185	sq.ft	0	16,325	860	0
1080	Delamination/Spall/Patched		860	sq.ft	0	0	860	0
510	Wearing Surfaces		17,185	sq.ft	0	16,325	860	0
Deck; deck condition cannot be seen because of AC overlay ,Deterioration of the protected element has progressed. Cracking and efflorescence on the undersurface is moderate .								
110	Re Conc Opn Girder/Beam	1	1,458	ft	1,298	160	0	0
1130	Cracking (RC and Other)		175	ft	15	160	0	0
Minor cracks and spalls may be present.								
155	Re Conc Floor Beam	1	2,400	ft	2,400	0	0	0
The elements shows little or no deterioration.								
205	Re Conc Column	1	30	each	28	2	0	0
Minor cracks and spalls may be present, but there is no exposed reinforcing or surface evidence of rebar corrosion.								
215	Re Conc Abutment	1	58	ft	54	4	0	0
1130	Cracking (RC and Other)		4	ft	0	4	0	0
Large crack in abutment ledge South abutment.								
234	Re Conc Pier Cap	1	525	ft	525	0	0	0
The elements shows little or no deterioration. There may be discoloration, efflorescence, and / or superficial cracking, but without effect on strength and / or serviceability.								
311	Moveable Bearing	1	21	each	21	0	0	0
515	Steel Protective Coating		10,753	sq.ft	10,753	0	0	0

The elements shows little or no deterioration. The paint system, if present, is sound and functioning as intended to protect the metal. The bearing has minimal debris and corrosion. Vertical and horizontal alignment are within limits. Bearing support member is sound. Any lubrication system is functioning properly.

331	Re Conc Bridge Railing	1	982	ft	482	315	185	0
1080	Delamination/Spall/Patched		184	ft	0	0	184	0
1130	Cracking (RC and Other)		315	ft	0	315	0	0
521	Conc Prot Coating		400	sq.ft	400	0	0	0

Some delaminations and /or spalls may be present, and some reinforcing may be exposed. Corrosion of rebar may be present, but loss of section is incidental and does not significantly affect the strength and /or serviceability of either the element or the bridge.

7361	Scour	1	1	(EA)	1	0	0	0
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Scour exists at the structure site, but is of little concern to the structural integrity of the bridge.

NBI ITEM CONDITION RATINGS			Describe defects noted during bridge inspection. Provide sketches, diagrams, and photographs where possible.
58	Deck	6	<p>Deck; deck condition cannot be seen because of AC overlay, deterioration of the protected element has progressed. Cracking and efflorescence on the undersurface is moderate.</p> <p>Re Conc Opn Girder/Beam; Minor cracks and spalls may be present.</p> <p>Re Conc Column; Minor cracks and spalls may be present.</p> <p>Re Conc Abutment; Large crack in abutment ledge South abutment.</p> <p>Re Conc Bridge Railing; Some delaminations and /or spalls may be present, and some reinforcing may be exposed. Protective coating deteriorated.</p>
59	Superstructure	7	
60	Substructure	7	
61	Channel and Channel Protection	7	
62	Culvert	N	

NBI ITEM 93 - CRITICAL FEATURE INSPECTION		REQUIRED	FREQUENCY	CURRENT	NEXT
93A	Fracture Critical Details	N			
93B	Underwater Inspection	N			
93C	Other Special Inspection	N			

OTHER FEATURES	REMARKS
Bridge Posted? (Provide Posted limit or 'N' if not applicable)	
3	
Signing for Posting Legible/Visible? (Y or N)	
Y	
Riding Surface (Roughness) Rating (3 - smooth, 2 - Avg, 1 - Poor)	
1	
Bridge Requires Insp by Bridge Section (Y or N) Applies to in-house inspectors who aren't structural engineers	
N	

REPAIRS, IMPROVEMENTS AND RECOMMENDATIONS

List all work done to this bridge since last inspection (ie: structural repair work, cleaning, maintenance work, etc.)

Guard railing has been upgraded to meet currently acceptable standards.

List proposed and/or recommended work for this bridge including estimated cost (ie: structural repair work, cleaning, maintenance, etc.)

Expansion Joints; repair and reseal. Wearing surface; resurface AC overlay on bridge deck. Abutment; Repair large crack in abutment ledge South abutment. Bridge Railing; patch and repair spalls and delaminations, apply protective coating. Repair broken support and sagging utility water line.

Other comments or observations.

Install embankment erosion Control. Cut back trees away from structure.

Inspector: **Name:** Michael Shimamoto **Title:** HCI-IV

Signature: _____ **Phone:** (808) 831-7600

Team Leader: **Name:** Richard Luster **Title:** SE

Signature: _____ **Phone:** (808) 831-7600

State of Hawaii
Department of Transportation
 BI Photo Log

##	Bridge Name: Kipapa Strm	Bridge #003000990301447	Date: Oct. 06, 2015
1	End post with name; Kipapa		
2	Missing raised buttons and potholes South end approach		
3	Missing raised buttons and potholes North end approach		
4	Spall with exposed rebar typical throughout bridge railing		
5	Spall on light pole base		
6	New up grade guard railing to all 4 railings.		
7	Weight restriction signs posted.		
8	Bridge railing members are out of alignment South end of structure.		
9	AC overlay over expansion at South abutment unraveling.		
10	Joint leakage from deteriorated joint seal South abutment.		
11	Underside of deck soffit no problems noted.		
12	Bridge railing protective coating has failed or is no longer effective.		
13	Utility water line on the side of the bridge has a broken support and is sagging.		
14	Large crack in abutment ledge South abutment.		
15	Erosion of embankment South abutment.		
16	Crack and minor spalls at construction joint on column.		
17	Channel is concrete lined.		
18	Heavy vegetation and tree growth under structure.		
19	View of structure looking from South to North.		
20	View of structure looking from North to South.		
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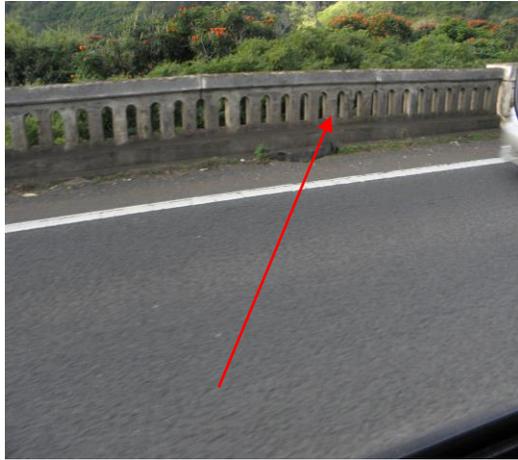
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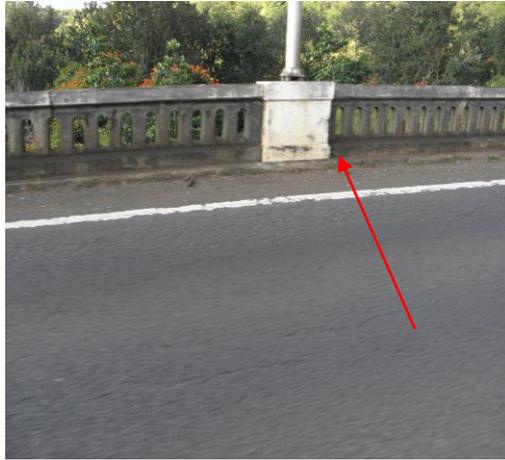
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APPENDIX C

OahuMPO Travel Demand Model Results

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2040 BASELINE ANALYSIS	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Vehicle Miles Travelled (VMT)	3,269,898	4,759,939	358,021	546,658	8,029,837	5,117,960
Person Miles Travelled (PMT)	4,577,858	6,663,914	501,230	765,322	11,241,772	7,165,144
Vehicle Hours of Delay (VHD)	47,529	86,392	4,285	12,487	133,921	90,676
Person Hours of Delay (PHD)	66,540	120,949	5,998	17,481	187,489	126,947
Congested Lane Miles (v/c)	135	215	21	25	350	236
Percent Congested	11%	16%	2%	2%	27%	18%
Congested Lane Miles (mph)	627	778	56	64	1,406	835
Percent Congested	53%	65%	5%	5%	117%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	341,446,052	522,393,675	35,702,192	60,374,780	863,839,727	558,095,867
Total Organic Gasses (TOG)	109,208	170,911	11,230	20,362	280,119	182,141
Carbon Monoxide (CO)	2,441,928	3,686,509	251,902	403,730	6,128,437	3,938,411
Oxides of Nitrogen (Nox)	225,715	336,137	24,151	38,461	561,852	360,288
Carbon Dioxide (CO2)	1,511,838,246	2,313,094,991	158,086,422	267,365,268	3,824,933,237	2,471,181,413
CO2 (Pavley I+LCFS)	976,425,560	1,493,893,439	102,103,699	172,678,668	2,470,318,999	1,595,997,138
Particulate < 10 microns (PM10)	8,304	13,321	816	1,562	21,625	14,137
Particulate < 2.5 microns (PM 2.5)	7,704	12,359	757	1,449	20,064	13,116

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:09	0:07:18
Wahiawa to Mililani Park and Ride	0:07:55	0:07:12
Wahiawa to Central Oahu Regional Park	0:14:21	0:11:36
Wahiawa to Koa Ridge	0:11:56	0:11:05
Wahiawa to Pearl Highlands	0:23:30	0:17:37
Mililani Middle School to Mililani Town Center	0:04:56	0:04:21
Mililani Middle School to Mililani Mauka Park and Ride	0:02:06	0:01:54
Mililani Middle School to Central Oahu Regional Park	0:12:59	0:09:48
Mililani Middle School to Koa Ridge	0:12:34	0:12:11
Mililani Middle School to Highlands Transit	0:24:47	0:16:29
Mililani Town Center to Mililani Town Center	-	-
Mililani Town Center to Mililani Mauka Park and Ride	0:02:58	0:02:58
Mililani Town Center to Central Oahu Regional Park	0:08:41	0:06:27
Mililani Town Center to Koa Ridge	0:09:36	0:07:25
Mililani Town Center to Highlands Transit	0:20:04	0:13:07
Crestview Community Park to Mililani Town Center	0:08:35	0:14:06
Crestview Community Park to Mililani Mauka Park and Ride	0:10:47	0:18:35
Crestview Community Park to Central Oahu Regional Park	0:02:48	0:04:01
Crestview Community Park to Koa Ridge	0:06:13	0:08:03
Crestview Community Park to Highlands Transit	0:10:18	0:06:37
Waikele (Fire Station) to Mililani Town Center	0:08:03	0:13:42
Waikele (Fire Station) to Mililani Mauka Park and Ride	0:11:31	0:19:29
Waikele (Fire Station) to Central Oahu Regional Park	0:02:17	0:03:37
Waikele (Fire Station) to Koa Ridge	0:05:42	0:07:39
Waikele (Fire Station) to Highlands Transit	0:04:54	0:08:44
AREA WIDE TOTAL TRAVEL TIME	3:55:38	3:54:02

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:20:46	0:13:12
	Kapolei	0:23:47	0:36:09
	PUC	0:52:51	0:31:19
	UH	0:59:45	0:36:28
TOTAL TRAVEL TIME		2:37:08	1:57:08

403.5 - Kamehameha Hwy Widening Analysis	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,269,468	4,758,795	358,397	547,575	8,028,262	5,117,191
Person Miles Travelled (PMT)	4,577,255	6,662,312	501,755	766,605	11,239,567	7,164,068
Vehicle Hours of Delay (VHD)	46,934	85,407	3,696	11,468	132,342	89,103
Person Hours of Delay (PHD)	65,708	119,570	5,175	16,055	185,278	124,745
Congested Lane Miles (v/c)	131	212	17	22	344	229
Percent Congested	10%	16%	1%	2%	26%	17%
Congested Lane Miles (mph)	617	780	47	65	1,397	827
Percent Congested	52%	65%	4%	5%	116%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	340,915,004	521,413,053	35,202,470	59,672,340	862,328,057	556,615,523
Total Organic Gasses (TOG)	108,993	170,520	11,018	20,069	279,513	181,538
Carbon Monoxide (CO)	2,436,896	3,677,935	247,255	396,957	6,114,831	3,925,190
Oxides of Nitrogen (Nox)	225,507	335,686	23,982	38,172	561,193	359,668
Carbon Dioxide (CO2)	1,509,488,980	2,308,755,743	155,875,626	264,258,005	3,818,244,723	2,464,631,368
CO2 (Pavley I+LCFS)	974,909,063	1,491,092,008	100,676,668	170,672,865	2,466,001,072	1,591,768,676
Particulate < 10 microns (PM10)	8,278	13,275	790	1,524	21,553	14,065
Particulate < 2.5 microns (PM 2.5)	7,680	12,317	733	1,414	19,997	13,049

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:02	0:07:08
Wahiawa to Mililani Park and Ride	0:07:47	0:07:03
Wahiawa to Central Oahu Regional Park	0:11:55	0:10:50
Wahiawa to Koa Ridge	0:11:38	0:11:03
Wahiawa to Pearl Highlands	0:23:15	0:17:34
Mililani Middle School to Mililani Town Center	0:04:58	0:04:20
Mililani Middle School to Mililani Mauka Park	0:02:06	0:01:54
Mililani Middle School to Central Oahu Regional Park	0:11:55	0:09:20
Mililani Middle School to Koa Ridge	0:12:09	0:12:10
Mililani Middle School to Highlands Transit	0:23:46	0:15:58
Mililani Town Center to Mililani Town Center	-	-
Mililani Town Center to Mililani Mauka Park	0:02:57	0:02:58
Mililani Town Center to Central Oahu Regional Park	0:05:54	0:05:33
Mililani Town Center to Koa Ridge	0:08:33	0:07:31
Mililani Town Center to Highlands Transit	0:17:41	0:12:28
Crestview Community Park to Mililani Town Center	0:08:10	0:10:47
Crestview Community Park to Mililani Mauka Park	0:10:51	0:17:34
Crestview Community Park to Central Oahu Regional Park	0:02:50	0:04:18
Crestview Community Park to Koa Ridge	0:06:19	0:08:28
Crestview Community Park to Highlands Transit	0:10:31	0:06:49
Waikele (Fire Station) to Mililani Town Center	0:07:38	0:10:25
Waikele (Fire Station) to Mililani Mauka Park	0:11:34	0:17:46
Waikele (Fire Station) to Central Oahu Regional Park	0:02:17	0:03:56
Waikele (Fire Station) to Koa Ridge	0:05:46	0:08:06
Waikele (Fire Station) to Highlands Transit	0:05:04	0:09:00
AREA WIDE TOTAL TRAVEL TIME	3:43:33	3:42:59

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:18:21	0:12:33
	Kapolei	0:22:39	0:36:15
	PUC	0:51:36	0:31:13
	UH	0:58:28	0:36:20
TOTAL TRAVEL TIME		2:31:04	1:56:21

403.8 - Kamehameha Hwy HOV	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,270,142	4,759,447	355,032	539,688	8,029,589	5,114,479
Person Miles Travelled (PMT)	4,578,199	6,663,226	497,045	755,563	11,241,425	7,160,271
Vehicle Hours of Delay (VHD)	47,218	85,991	3,950	11,887	133,209	89,941
Person Hours of Delay (PHD)	66,106	120,387	5,531	16,641	186,493	125,918
Congested Lane Miles (v/c)	131	215	17	24	346	232
Percent Congested	10%	16%	1%	2%	27%	18%
Congested Lane Miles (mph)	626	778	53	62	1,403	831
Percent Congested	52%	64%	4%	5%	117%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	341,132,501	522,076,809	35,079,673	59,486,251	863,209,310	557,156,482
Total Organic Gasses (TOG)	109,079	170,814	11,009	20,099	279,893	181,823
Carbon Monoxide (CO)	2,439,008	3,682,675	246,764	395,520	6,121,683	3,929,440
Oxides of Nitrogen (Nox)	225,624	335,993	23,843	37,894	561,617	359,836
Carbon Dioxide (CO2)	1,510,451,077	2,311,694,438	155,331,209	263,433,931	3,822,145,515	2,467,025,647
CO2 (Pavley I+LCFS)	975,530,315	1,492,989,496	100,324,843	170,140,088	2,468,519,810	1,593,314,339
Particulate < 10 microns (PM10)	8,286	13,307	792	1,536	21,594	14,099
Particulate < 2.5 microns (PM 2.5)	7,688	12,346	735	1,425	20,034	13,081

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:10	0:07:19
Wahiawa to Mililani Park and Ride	0:07:56	0:07:13
Wahiawa to Central Oahu Regional Park	0:13:51	0:11:14
Wahiawa to Koa Ridge	0:11:58	0:11:03
Wahiawa to Pearl Highlands	0:23:08	0:17:24
Mililani Middle School to Mililani Town Center	0:04:56	0:04:21
Mililani Middle School to Mililani Mauka	0:02:06	0:01:54
Mililani Middle School to Central Oahu Regional Park	0:12:58	0:09:42
Mililani Middle School to Koa Ridge	0:12:36	0:12:09
Mililani Middle School to Highlands Transit	0:24:19	0:16:13
Mililani Town Center to Mililani Town Center	-	-
Mililani Town Center to Mililani Mauka	0:02:58	0:02:58
Mililani Town Center to Central Oahu Regional Park	0:08:53	0:06:34
Mililani Town Center to Koa Ridge	0:09:35	0:07:20
Mililani Town Center to Highlands Transit	0:19:09	0:12:40
Crestview Community Park to Mililani Town Center	0:08:14	0:13:29
Crestview Community Park to Mililani Mauka	0:10:28	0:17:36
Crestview Community Park to Central Oahu Regional Park	0:02:26	0:02:34
Crestview Community Park to Koa Ridge	0:05:51	0:07:02
Crestview Community Park to Highlands Transit	0:09:52	0:06:32
Waikele (Fire Station) to Mililani Town Center	0:07:42	0:13:02
Waikele (Fire Station) to Mililani Mauka	0:11:24	0:19:01
Waikele (Fire Station) to Central Oahu Regional Park	0:01:54	0:02:06
Waikele (Fire Station) to Koa Ridge	0:05:19	0:06:35
Waikele (Fire Station) to Highlands Transit	0:04:23	0:08:43
AREA WIDE TOTAL TRAVEL TIME	3:50:07	3:44:43

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:19:53	0:12:45
	Kapolei	0:23:19	0:36:18
	PUC	0:52:29	0:31:16
	UH	0:59:22	0:36:23
TOTAL TRAVEL TIME		2:35:04	1:56:42

404.2 - H-2/Meheula Pkwy On-Ramp Widening Analysis	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,271,018	4,760,450	359,077	547,142	8,031,468	5,119,527
Person Miles Travelled (PMT)	4,579,425	6,664,630	502,708	765,999	11,244,055	7,167,338
Vehicle Hours of Delay (VHD)	47,386	86,361	4,137	12,423	133,747	90,497
Person Hours of Delay (PHD)	66,341	120,905	5,792	17,392	187,246	126,696
Congested Lane Miles (v/c)	135	214	20	26	349	234
Percent Congested	11%	16%	2%	2%	27%	18%
Congested Lane Miles (mph)	630	778	57	64	1,408	835
Percent Congested	53%	65%	5%	5%	117%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	341,475,503	522,412,279	35,714,560	60,469,533	863,887,782	558,126,840
Total Organic Gasses (TOG)	109,186	170,884	11,200	20,383	280,069	182,084
Carbon Monoxide (CO)	2,442,784	3,687,336	252,691	404,676	6,130,121	3,940,027
Oxides of Nitrogen (Nox)	225,778	336,180	24,207	38,517	561,959	360,387
Carbon Dioxide (CO2)	1,511,967,734	2,313,176,383	158,140,193	267,784,418	3,825,144,117	2,471,316,576
CO2 (Pavley I+LCFS)	976,509,254	1,493,946,032	102,138,495	172,949,331	2,470,455,286	1,596,084,527
Particulate < 10 microns (PM10)	8,301	13,318	813	1,564	21,619	14,131
Particulate < 2.5 microns (PM 2.5)	7,702	12,357	754	1,451	20,058	13,111

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:13	0:07:21
Wahiawa to Mililani Park and Ride	0:07:54	0:07:13
Wahiawa to Central Oahu Regional Park	0:13:59	0:11:39
Wahiawa to Koa Ridge	0:11:53	0:11:06
Wahiawa to Pearl Highlands	0:23:36	0:17:36
Mililani Middle School to Mililani Town Center	0:05:06	0:04:23
Mililani Middle School to Mililani Mauka	0:02:06	0:01:54
Mililani Middle School to Central Oahu Regional Park	0:08:54	0:08:15
Mililani Middle School to Koa Ridge	0:12:30	0:12:12
Mililani Middle School to Highlands Transit	0:20:50	0:14:54
Mililani Town Center to Mililani Town Center	0:00:00	0:00:00
Mililani Town Center to Mililani Mauka	0:03:01	0:02:59
Mililani Town Center to Central Oahu Regional Park	0:08:15	0:06:31
Mililani Town Center to Koa Ridge	0:10:35	0:07:36
Mililani Town Center to Highlands Transit	0:19:48	0:13:11
Crestview Community Park to Mililani Town Center	0:08:35	0:14:07
Crestview Community Park to Mililani Mauka	0:10:47	0:18:37
Crestview Community Park to Central Oahu Regional Park	0:02:48	0:04:01
Crestview Community Park to Koa Ridge	0:06:12	0:08:04
Crestview Community Park to Highlands Transit	0:10:23	0:06:38
Waialele (Fire Station) to Mililani Town Center	0:08:04	0:13:43
Waialele (Fire Station) to Mililani Mauka	0:11:32	0:19:29
Waialele (Fire Station) to Central Oahu Regional Park	0:02:17	0:03:37
Waialele (Fire Station) to Koa Ridge	0:05:40	0:07:40
Waialele (Fire Station) to Highlands Transit	0:04:57	0:08:45
AREA WIDE TOTAL TRAVEL TIME	3:47:56	3:51:31

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:20:28	0:13:16
	Kapolei	0:24:49	0:36:19
	PUC	0:53:43	0:31:29
	UH	1:00:32	0:36:36
TOTAL TRAVEL TIME		2:39:33	1:57:40

404.3 - H-2/Kamehameha Hwy Ramp Widening Analysis	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,271,664	4,762,570	359,668	550,662	8,034,234	5,122,239
Person Miles Travelled (PMT)	4,580,329	6,667,598	503,536	770,927	11,247,928	7,171,134
Vehicle Hours of Delay (VHD)	47,581	86,591	4,339	12,529	134,172	90,930
Person Hours of Delay (PHD)	66,613	121,227	6,075	17,541	187,840	127,302
Congested Lane Miles (v/c)	136	216	21	25	351	237
Percent Congested	11%	16%	2%	2%	27%	18%
Congested Lane Miles (mph)	626	781	55	67	1,407	836
Percent Congested	52%	65%	5%	5%	117%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	341,340,319	522,993,999	35,793,354	60,779,318	864,334,318	558,787,354
Total Organic Gasses (TOG)	109,125	171,158	11,240	20,467	280,283	182,398
Carbon Monoxide (CO)	2,443,034	3,689,707	253,514	407,345	6,132,741	3,943,221
Oxides of Nitrogen (Nox)	225,741	336,413	24,226	38,743	562,154	360,639
Carbon Dioxide (CO2)	1,511,367,314	2,315,754,628	158,488,616	269,155,407	3,827,121,942	2,474,243,244
CO2 (Pavley I+LCFS)	976,121,253	1,495,610,962	102,363,280	173,834,793	2,471,732,214	1,597,974,242
Particulate < 10 microns (PM10)	8,299	13,343	818	1,570	21,642	14,161
Particulate < 2.5 microns (PM 2.5)	7,700	12,379	759	1,456	20,079	13,138

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:04	0:07:29
Wahiawa to Mililani Park and Ride	0:07:50	0:07:23
Wahiawa to Central Oahu Regional Park	0:14:27	0:11:58
Wahiawa to Koa Ridge	0:11:55	0:11:18
Wahiawa to Pearl Highlands	0:23:40	0:17:53
Mililani Middle School to Mililani Town Center	0:04:56	0:04:21
Mililani Middle School to Mililani Mauka	0:02:06	0:01:54
Mililani Middle School to Central Oahu Regional Park	0:13:03	0:09:57
Mililani Middle School to Koa Ridge	0:12:36	0:12:22
Mililani Middle School to Highlands Transit	0:25:00	0:16:42
Mililani Town Center to Mililani Town Center	-	-
Mililani Town Center to Mililani Mauka	0:02:58	0:02:59
Mililani Town Center to Central Oahu Regional Park	0:08:48	0:06:42
Mililani Town Center to Koa Ridge	0:09:41	0:07:28
Mililani Town Center to Highlands Transit	0:20:19	0:13:23
Crestview Community Park to Mililani Town Center	0:08:32	0:14:00
Crestview Community Park to Mililani Mauka	0:10:47	0:18:32
Crestview Community Park to Central Oahu Regional Park	0:02:48	0:04:01
Crestview Community Park to Koa Ridge	0:06:13	0:08:04
Crestview Community Park to Highlands Transit	0:10:19	0:06:34
Waikele (Fire Station) to Mililani Town Center	0:08:00	0:13:35
Waikele (Fire Station) to Mililani Mauka	0:11:32	0:19:27
Waikele (Fire Station) to Central Oahu Regional Park	0:02:16	0:03:37
Waikele (Fire Station) to Koa Ridge	0:05:42	0:07:40
Waikele (Fire Station) to Highlands Transit	0:04:56	0:08:45
AREA WIDE TOTAL TRAVEL TIME	3:56:26	3:56:05

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:21:00	0:13:28
	Kapolei	0:24:03	0:36:29
	PUC	0:53:00	0:31:23
	UH	0:59:52	0:36:33
TOTAL TRAVEL TIME		2:37:55	1:57:53

406.1 - New Central Mauka Road Analysis	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,261,573	4,750,085	356,325	546,886	8,011,658	5,106,411
Person Miles Travelled (PMT)	4,566,203	6,650,119	498,856	765,640	11,216,322	7,148,975
Vehicle Hours of Delay (VHD)	44,219	79,040	2,753	8,270	123,259	81,794
Person Hours of Delay (PHD)	61,906	110,657	3,854	11,578	172,563	114,511
Congested Lane Miles (v/c)	125	216	11	24	341	227
Percent Congested	10%	16%	1%	2%	26%	17%
Congested Lane Miles (mph)	626	782	52	64	1,408	834
Percent Congested	52%	64%	4%	5%	117%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	336,535,927	514,328,450	33,596,744	55,946,319	850,864,377	547,925,194
Total Organic Gasses (TOG)	106,814	166,854	10,263	17,987	273,668	177,117
Carbon Monoxide (CO)	2,420,540	3,656,713	241,102	388,789	6,077,253	3,897,815
Oxides of Nitrogen (Nox)	223,981	333,580	23,420	37,275	557,561	356,999
Carbon Dioxide (CO2)	1,490,078,472	2,277,345,051	148,758,262	247,733,892	3,767,423,523	2,426,103,313
CO2 (Pavley I+LCFS)	962,374,969	1,470,809,444	96,080,798	160,003,277	2,433,184,413	1,566,890,241
Particulate < 10 microns (PM10)	8,078	12,941	719	1,330	21,019	13,661
Particulate < 2.5 microns (PM 2.5)	7,494	12,007	667	1,234	19,501	12,674

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:06	0:07:22
Wahiawa to Mililani Park and Ride	0:07:58	0:07:11
Wahiawa to Central Oahu Regional Park	0:12:26	0:11:21
Wahiawa to Koa Ridge	0:11:51	0:10:58
Wahiawa to Pearl Highlands	0:20:32	0:16:10
Mililani Middle School to Mililani Town Center	0:04:20	0:04:30
Mililani Middle School to Mililani Mauka	0:01:54	0:01:59
Mililani Middle School to Central Oahu Regional Park	0:08:19	0:08:10
Mililani Middle School to Koa Ridge	0:07:56	0:07:37
Mililani Middle School to Highlands Transit	0:12:18	0:10:20
Mililani Town Center to Mililani Town Center	0:00:00	0:00:00
Mililani Town Center to Mililani Mauka	0:02:57	0:02:56
Mililani Town Center to Central Oahu Regional Park	0:06:58	0:06:20
Mililani Town Center to Koa Ridge	0:07:39	0:07:17
Mililani Town Center to Highlands Transit	0:15:40	0:11:41
Crestview Community Park to Mililani Town Center	0:08:30	0:11:05
Crestview Community Park to Mililani Mauka	0:10:29	0:12:30
Crestview Community Park to Central Oahu Regional Park	0:02:47	0:03:11
Crestview Community Park to Koa Ridge	0:06:11	0:06:47
Crestview Community Park to Highlands Transit	0:08:31	0:05:53
Waikele (Fire Station) to Mililani Town Center	0:07:58	0:10:38
Waikele (Fire Station) to Mililani Mauka	0:10:43	0:12:18
Waikele (Fire Station) to Central Oahu Regional Park	0:02:16	0:02:44
Waikele (Fire Station) to Koa Ridge	0:05:40	0:06:20
Waikele (Fire Station) to Highlands Transit	0:04:18	0:06:37
AREA WIDE TOTAL TRAVEL TIME	3:16:19	3:11:53

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:17:03	0:12:12
	Kapolei	0:20:58	0:35:40
	PUC	0:46:52	0:29:55
	UH	0:53:59	0:35:11
TOTAL TRAVEL TIME		2:18:52	1:52:58

406.2 - New Rd (Whitmore to California) Analysis	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,277,966	4,772,701	367,252	560,587	8,050,667	5,139,953
Person Miles Travelled (PMT)	4,589,152	6,681,782	514,152	784,822	11,270,934	7,195,934
Vehicle Hours of Delay (VHD)	47,517	86,417	4,340	12,577	133,935	90,757
Person Hours of Delay (PHD)	66,524	120,984	6,076	17,608	187,509	127,060
Congested Lane Miles (v/c)	134	215	21	25	349	236
Percent Congested	11%	16%	2%	2%	27%	18%
Congested Lane Miles (mph)	630	782	57	68	1,412	840
Percent Congested	53%	65%	5%	5%	117%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	342,140,360	523,349,896	36,828,140	61,570,074	865,490,256	560,178,036
Total Organic Gasses (TOG)	109,413	171,155	11,625	20,711	280,568	182,780
Carbon Monoxide (CO)	2,446,743	3,693,967	258,591	412,235	6,140,710	3,952,558
Oxides of Nitrogen (Nox)	226,220	336,902	24,821	39,330	563,122	361,723
Carbon Dioxide (CO2)	1,514,912,761	2,317,328,125	163,073,873	272,657,905	3,832,240,886	2,480,401,998
CO2 (Pavley I+LCFS)	978,411,457	1,496,627,793	105,324,865	176,097,227	2,475,039,250	1,601,952,657
Particulate < 10 microns (PM10)	8,317	13,335	846	1,585	21,652	14,181
Particulate < 2.5 microns (PM 2.5)	7,716	12,372	785	1,470	20,088	13,157

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:26	0:07:18
Wahiawa to Mililani Park and Ride	0:08:13	0:07:12
Wahiawa to Central Oahu Regional Park	0:14:38	0:11:36
Wahiawa to Koa Ridge	0:12:14	0:11:06
Wahiawa to Pearl Highlands	0:23:47	0:17:37
Mililani Middle School to Mililani Town Center	0:04:56	0:04:21
Mililani Middle School to Mililani Mauka	0:02:06	0:01:54
Mililani Middle School to Central Oahu Regional Park	0:13:00	0:09:49
Mililani Middle School to Koa Ridge	0:12:41	0:12:12
Mililani Middle School to Highlands Transit	0:24:46	0:16:30
Mililani Town Center to Mililani Town Center	-	-
Mililani Town Center to Mililani Mauka	0:02:58	0:02:58
Mililani Town Center to Central Oahu Regional Park	0:08:42	0:06:27
Mililani Town Center to Koa Ridge	0:09:38	0:07:26
Mililani Town Center to Highlands Transit	0:20:05	0:13:07
Crestview Community Park to Mililani Town Center	0:08:35	0:14:12
Crestview Community Park to Mililani Mauka	0:10:47	0:18:37
Crestview Community Park to Central Oahu Regional Park	0:02:48	0:04:01
Crestview Community Park to Koa Ridge	0:06:13	0:08:04
Crestview Community Park to Highlands Transit	0:10:14	0:06:38
Waikele (Fire Station) to Mililani Town Center	0:08:03	0:13:48
Waikele (Fire Station) to Mililani Mauka	0:11:31	0:19:29
Waikele (Fire Station) to Central Oahu Regional Park	0:02:17	0:03:37
Waikele (Fire Station) to Koa Ridge	0:05:42	0:07:40
Waikele (Fire Station) to Highlands Transit	0:04:51	0:08:44
AREA WIDE TOTAL TRAVEL TIME	3:57:10	3:54:25

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:20:47	0:13:12
	Kapolei	0:23:49	0:36:09
	PUC	0:53:00	0:31:19
	UH	0:59:52	0:36:28
TOTAL TRAVEL TIME		2:37:27	1:57:08

406.3 - New Road (California to Meheula Pkwy) Analysis	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,269,130	4,757,358	357,604	544,552	8,026,488	5,114,962
Person Miles Travelled (PMT)	4,576,782	6,660,301	500,645	762,373	11,237,084	7,160,947
Vehicle Hours of Delay (VHD)	47,471	86,134	4,233	12,194	133,606	90,368
Person Hours of Delay (PHD)	66,460	120,588	5,927	17,072	187,048	126,515
Congested Lane Miles (v/c)	134	215	21	25	349	235
Percent Congested	11%	16%	2%	2%	27%	18%
Congested Lane Miles (mph)	627	779	56	65	1,406	835
Percent Congested	52%	65%	5%	5%	117%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	341,339,036	522,117,068	35,684,126	60,157,743	863,456,104	557,801,194
Total Organic Gasses (TOG)	109,174	170,787	11,226	20,278	279,961	182,013
Carbon Monoxide (CO)	2,441,318	3,685,256	251,808	402,540	6,126,574	3,937,063
Oxides of Nitrogen (Nox)	225,653	335,978	24,131	38,322	561,631	360,109
Carbon Dioxide (CO2)	1,511,364,162	2,311,869,219	158,006,369	266,403,760	3,823,233,381	2,469,875,588
CO2 (Pavley I+LCFS)	976,119,356	1,493,101,741	102,051,955	172,057,629	2,469,221,096	1,595,153,696
Particulate < 10 microns (PM10)	8,302	13,312	816	1,556	21,613	14,128
Particulate < 2.5 microns (PM 2.5)	7,702	12,350	757	1,443	20,053	13,108

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:07:58	0:06:59
Wahiawa to Mililani Park and Ride	0:07:44	0:06:52
Wahiawa to Central Oahu Regional Park	0:14:12	0:11:23
Wahiawa to Koa Ridge	0:11:44	0:10:45
Wahiawa to Pearl Highlands	0:23:19	0:17:15
Mililani Middle School to Mililani Town C	0:05:00	0:04:26
Mililani Middle School to Mililani Mauka	0:02:11	0:01:59
Mililani Middle School to Central Oahu F	0:13:02	0:09:50
Mililani Middle School to Koa Ridge	0:12:26	0:11:56
Mililani Middle School to Highlands Tran	0:24:50	0:16:30
Mililani Town Center to Mililani Town Ce	0:00:00	0:00:00
Mililani Town Center to Mililani Mauka F	0:02:58	0:02:58
Mililani Town Center to Central Oahu Re	0:08:38	0:06:23
Mililani Town Center to Koa Ridge	0:09:34	0:07:24
Mililani Town Center to Highlands Trans	0:20:02	0:13:00
Crestview Community Park to Mililani To	0:08:34	0:13:55
Crestview Community Park to Mililani M	0:10:32	0:17:21
Crestview Community Park to Central Oa	0:02:48	0:04:01
Crestview Community Park to Koa Ridge	0:06:13	0:08:04
Crestview Community Park to Highlands	0:10:16	0:06:36
Waikele (Fire Station) to Mililani Town C	0:08:02	0:13:31
Waikele (Fire Station) to Mililani Mauka	0:11:16	0:18:13
Waikele (Fire Station) to Central Oahu R	0:02:16	0:03:37
Waikele (Fire Station) to Koa Ridge	0:05:42	0:07:40
Waikele (Fire Station) to Highlands Tran	0:04:52	0:08:42
AREA WIDE TOTAL TRAVEL TIME	3:54:11	3:49:19

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:20:44	0:13:06
	Kapolei	0:23:45	0:36:07
	PUC	0:52:52	0:31:19
	UH	0:59:45	0:36:29
TOTAL TRAVEL TIME		2:37:06	1:57:02

407.1 - Paia Extension Analysis	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Vehicle Miles Travelled (VMT)	3,287,924	4,773,162	358,083	551,635	8,061,086	5,131,245
Person Miles Travelled (PMT)	4,603,094	6,682,426	501,317	772,289	11,285,520	7,183,743
Vehicle Hours of Delay (VHD)	67,933	113,086	6,629	17,747	181,019	119,714
Person Hours of Delay (PHD)	95,106	158,320	9,280	24,846	253,426	167,600
Congested Lane Miles (v/c)	191	254	20	27	445	275
Percent Congested	16%	21%	2%	2%	37%	22%
Congested Lane Miles (mph)	646	825	62	75	1,471	887
Percent Congested	58%	73%	5%	6%	130%	78%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	370,691,648	554,661,964	39,043,104	66,593,913	925,353,612	593,705,068
Total Organic Gasses (TOG)	123,766	187,223	12,950	23,544	310,989	200,173
Carbon Monoxide (CO)	2,559,379	3,809,363	264,560	423,528	6,368,742	4,073,923
Oxides of Nitrogen (Nox)	234,642	345,464	25,034	40,222	580,106	370,498
Carbon Dioxide (CO2)	1,641,458,073	2,456,121,540	172,894,737	294,937,040	4,097,579,614	2,629,016,278
CO2 (Pavley I+LCFS)	1,060,119,597	1,586,243,835	111,664,775	190,481,565	2,646,363,433	1,697,908,611
Particulate < 10 microns (PM10)	9,695	14,868	984	1,861	24,564	15,852
Particulate < 2.5 microns (PM 2.5)	8,995	13,795	913	1,726	22,790	14,707

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:39	0:07:42
Wahiawa to Mililani Park and Ride	0:08:27	0:07:34
Wahiawa to Central Oahu Regional Park	0:19:57	0:14:20
Wahiawa to Koa Ridge	0:12:16	0:12:03
Wahiawa to Pearl Highlands	0:29:01	0:18:25
Mililani Middle School to Mililani Town Center	0:04:56	0:04:24
Mililani Middle School to Mililani Mauka	0:02:06	0:01:54
Mililani Middle School to Central Oahu Park	0:17:52	0:12:56
Mililani Middle School to Koa Ridge	0:13:21	0:13:44
Mililani Middle School to Highlands Transit	0:33:09	0:17:47
Mililani Town Center to Mililani Town Center	0:00:00	0:00:00
Mililani Town Center to Mililani Mauka	0:03:00	0:03:00
Mililani Town Center to Central Oahu Regional Park	0:15:10	0:09:50
Mililani Town Center to Koa Ridge	0:12:47	0:08:34
Mililani Town Center to Highlands Transit	0:29:56	0:16:12
Crestview Community Park to Mililani Town Center	0:10:06	0:16:35
Crestview Community Park to Mililani Mauka	0:10:57	0:20:42
Crestview Community Park to Central Oahu Regional Park	0:02:37	0:02:54
Crestview Community Park to Koa Ridge	0:04:23	0:05:05
Crestview Community Park to Highlands Transit	0:14:24	0:06:46
Waikele (Fire Station) to Mililani Town Center	0:09:30	0:16:03
Waikele (Fire Station) to Mililani Mauka	0:12:06	0:21:21
Waikele (Fire Station) to Central Oahu Regional Park	0:02:00	0:02:23
Waikele (Fire Station) to Koa Ridge	0:03:47	0:04:34
Waikele (Fire Station) to Highlands Transit	0:06:15	0:08:44
AREA WIDE TOTAL TRAVEL TIME	4:46:42	4:13:35

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:29:18	0:16:09
	Kapolei	0:28:06	0:49:14
	PUC	1:03:22	0:33:26
	UH	1:10:42	0:39:54
TOTAL TRAVEL TIME		3:11:27	2:18:43

408.1 - New Road (Pineapple Interchange)	MODEL WIDE		STUDY AREA		MODEL WIDE	STUDY AREA
	AM	PM	AM	PM	TOTALS (AM+PM)	
Measure of Effectiveness (MOE)						
Vehicle Miles Travelled (VMT)	3,268,180	4,756,799	356,384	544,041	8,024,979	5,113,184
Person Miles Travelled (PMT)	4,575,452	6,659,519	498,938	761,657	11,234,971	7,158,457
Vehicle Hours of Delay (VHD)	47,188	85,819	3,951	11,920	133,007	89,770
Person Hours of Delay (PHD)	66,063	120,147	5,531	16,688	186,210	125,678
Congested Lane Miles (v/c)	134	215	19	25	349	234
Percent Congested	11%	16%	2%	2%	27%	18%
Congested Lane Miles (mph)	632	780	58	65	1,412	838
Percent Congested	53%	65%	5%	5%	118%	69%
Average Vehicle Occupancy (AVO)	1.4	1.4	1.4	1.4	2.8	2.8
Fuel Consumption (gallons)	340,922,881	521,586,468	35,340,090	59,400,101	862,509,350	556,926,558
Total Organic Gasses (TOG)	108,978	170,510	11,075	19,881	279,488	181,585
Carbon Monoxide (CO)	2,439,283	3,683,291	249,825	399,978	6,122,574	3,933,116
Oxides of Nitrogen (Nox)	225,498	335,833	23,983	38,120	561,331	359,816
Carbon Dioxide (CO2)	1,509,520,251	2,309,517,321	156,482,444	263,045,110	3,819,037,572	2,465,999,765
CO2 (Pavley I+LCFS)	974,928,784	1,491,583,377	101,067,976	169,889,194	2,466,512,161	1,592,651,354
Particulate < 10 microns (PM10)	8,282	13,282	801	1,515	21,564	14,083
Particulate < 2.5 microns (PM 2.5)	7,684	12,323	743	1,406	20,007	13,066

TRAVEL TIME CORRIDOR	AM	PM
Wahiawa to Mililani Town Center	0:08:00	0:07:17
Wahiawa to Mililani Park and Ride	0:07:51	0:07:08
Wahiawa to Central Oahu Regional Park	0:13:22	0:11:32
Wahiawa to Koa Ridge	0:11:47	0:11:02
Wahiawa to Pearl Highlands	0:23:23	0:17:39
Mililani Middle School to Mililani Town Center	0:04:30	0:04:20
Mililani Middle School to Mililani Mauka	0:02:00	0:01:53
Mililani Middle School to Central Oahu Regional Park	0:10:52	0:08:30
Mililani Middle School to Koa Ridge	0:12:23	0:12:08
Mililani Middle School to Highlands Transit	0:22:40	0:15:17
Mililani Town Center to Mililani Town Center	0:00:00	0:00:00
Mililani Town Center to Mililani Mauka	0:02:57	0:02:57
Mililani Town Center to Central Oahu Regional Park	0:07:39	0:06:23
Mililani Town Center to Koa Ridge	0:07:55	0:07:25
Mililani Town Center to Highlands Transit	0:18:58	0:13:03
Crestview Community Park to Mililani Town Center	0:08:32	0:13:17
Crestview Community Park to Mililani Mauka	0:10:28	0:15:13
Crestview Community Park to Central Oahu Regional Park	0:02:48	0:04:02
Crestview Community Park to Koa Ridge	0:06:11	0:08:05
Crestview Community Park to Highlands Transit	0:10:12	0:06:38
Waikele (Fire Station) to Mililani Town Center	0:08:01	0:12:53
Waikele (Fire Station) to Mililani Mauka	0:11:12	0:16:06
Waikele (Fire Station) to Central Oahu Regional Park	0:02:16	0:03:38
Waikele (Fire Station) to Koa Ridge	0:05:40	0:07:41
Waikele (Fire Station) to Highlands Transit	0:04:48	0:08:43
AREA WIDE TOTAL TRAVEL TIME	3:44:28	3:42:48

TRAVEL TIME CORRIDOR		AM	PM
Origin	Destination		
Mililani Town Center	Leeward CC	0:19:41	0:13:08
	Kapolei	0:22:11	0:36:10
	PUC	0:51:13	0:31:19
	UH	0:58:10	0:36:22
TOTAL TRAVEL TIME		2:31:13	1:57:00