Baseline Problems and Issues Technical Memorandum
Oahu Regional Transportation Plan 2035 Project

Deliverable 7.5.2

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Oahu Metropolitan Planning Organization

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Acronyms Used in this Document

CAC	Citizen Advisory Committee
CMP	Congestion Management Process
T6/EJ	Title VI/Environmental Justice
ITS	Intelligent Transportation System
LOS	Level of Service
OahuMPO	Oahu Metropolitan Planning Organization
ORTP	Oahu Regional Transportation Plan
PUC	Primary Urban Center
TAC	Technical Advisory Committee
TDM	Transportation Demand Management
TSM	Transportation System Management

Executive Summary

This report identifies potential problems and/or issues, particularly in the area of system deficiencies with respect to ORTP 2035 baseline results. Addressing these problems and issues will be a primary focus in the development and evaluation of ORTP 2035 alternative plan scenarios, leading to the development of the preferred alternative and final ORTP for the year 2035.

The problems and issues presented in this report are organized by the goals and objectives that have been identified for ORTP 2035. Five overarching goals were defined for this project, along with 25 supporting objectives. The problems and issues identified in this report are arranged under the following categories, along with their respective goals and objectives:

- Transportation Facilities
- Transportation Operations and Services
- Natural Environment
- Human Environment and Quality of Life
- Land Use and Transportation

The project team evaluated previous ORTP 2030 Technical Report and the ORTP 2035 work deliverables developed to help identify problems and issues.

Key findings documented in this memorandum include, but are not limited to, the following:

- The “reverse” commute in the H-1 corridor is likely to become much more pronounced due to the significant increase in employment projected for the Ewa-Kapolei areas. The effect may be exacerbated by the reduced capacity in the off-peak direction caused by the zipper lane operations.
- H-1 between the Middle Street Merge and University Avenue will continue to be congested in both directions throughout many hours of the day due to heavy volumes coupled with high levels of weaving, merging and diverging movements.
- H-2 Makai-bound in the AM peak period between Ka Uka Boulevard, and the Waiawa Merge and H-1 Koko Head-bound between the Ewa and Kapolei area to the Waiawa Merge will continue to be problem areas due to back-ups emanating from the Waiawa Interchange.
- Moanalua Freeway (H-201) between Puuloa Road and the Middle Street merge and H-1 between the Airport on-ramp and the Middle Street merge will continue to be problem areas due to heavy volumes and back-ups from the Middle Street Merge.
- Windward area residents using H-3 southbound in the AM peak to H-1 to commute to Ewa for work and returning on H-3 northbound from H-1 in the PM peak will add to the already congested H-1 corridor (LOS E in the AM peak period based on projected volume to capacity ratios). This is a result of the 40 percent more work

trips that are projected from the Windward areas to the Leeward areas in 2035 as compared to today.

- Farrington Highway in Waianae is consistently LOS E and F in 2007. These conditions are somewhat worse in the PM, and the roadway is susceptible to blockages by incidents at all times. Farrington Highway will likely get worse in 2035 with the projected 26 percent increase in number of households for this area.
- Roadways connecting the growing industrial area of Kalaeloa/Barbers Point with H-1 are projected to operate at LOS E and F in 2035. This is of particular concern for freight movements to and from the area.
- Regarding safety on state routes, the highest number of crashes (27 in three years) occurred at Likelike Highway (Route 63) and the junction with the northbound off-ramp to Kahekili highway (Route 83). Thirteen of the 35 high accident locations on state routes islandwide exist on Route 92, which includes sections of Nimitz Highway and Ala Moana Boulevard.
- Anticipated future development pressures will increase the potential for impacting sensitive cultural and environmental areas on Oahu.
- Mobility is projected to become worse for Title VI/Environmental Justice (T6/EJ) populations in 2035 baseline conditions when compared with non-T6/EJ populations. The differential in average auto travel times to employment centers between T6/EJ and non-T6/EJ populations is projected to increase from 15-to-19 minutes, and the differential in average transit travel times is projected to increase from 21-to-26 minutes.
- The development of new, or rehabilitation of existing, urban transportation infrastructure on Oahu will be done in light of new realities facing our planet. Increasing cost for fossil fuels, world-wide demands on resources needed for construction materials, and higher costs for land and labor pose many challenges for implementing agencies. Old ways of doing business may not be sufficient to meet the changing dynamics affecting project development or system maintenance on Oahu.
- The Second City (Kapolei) phenomenon is projected to materialize as indicated by the forecasted future socio-economic patterns (the number of households in 2035 is projected to increase by 121 percent over 2007 in the Ewa and Kapolei area, while the number of employees is projected to increase by 162 percent over 2007). The number of work trips for those who live and work in the Ewa and Kapolei area will increase by nearly 210 percent in 2035 over 2007. There will also be 85 percent more work trips to Ewa and Kapolei from the other areas of Oahu. Thus there is also potential for Kapolei residents to work elsewhere and Kapolei employees to live elsewhere, perhaps putting a greater burden on the H-1 corridor.
- Provision of the necessary transportation infrastructure to support the planned growth in the Ewa-Kapolei area is an issue. Many of the primary internal roadways are to be built by developers as their particular developments come on line. Due to differing timelines among developers/developments, there may be gaps in the

transportation network for significant periods of time impacting the ability of the facilities to provide their necessary function.

- The Waiawa-Koa Ridge area, with a projected increase of nearly 35,000 people by 2035, has the largest percent increase in population on the island. Traffic on H-2 and Kamehameha Highway will be significantly impacted without other roadway additions to provide access to-and-from the area, as well as circulation between developments within the overall area.
- Some pedestrian access routes connecting to future fixed guideway transit stations will require improvements (outside of the improvements to the immediate station areas which will be done as part of the proposed transit project). Growth in population and employment in areas beyond termini of fixed guideway transit will encourage increased demand at termini stations. These include the Kapolei and Ala Moana terminals.
- With increased development and roadway congestion inhibiting bus transit, some areas will suffer a decrease in transit level of service. This includes both the Waianae and Central Oahu areas.
- Bus vehicle throughput in downtown Honolulu (e.g., Hotel Street, King Street and Beretania Street) as well as on Kona Street at Ala Moana Center is at capacity during the peak periods. Congestion on the streets serving bus routes makes it difficult for buses to maintain their headways.

1 Introduction

1.1 Report Purpose

The purpose of this report is to identify potential problems and/or issues, particularly in the area of system deficiencies with respect to ORTP 2035 baseline results. Addressing these problems and issues will be a primary focus in the development and evaluation of ORTP 2035 alternative plan scenarios, leading to the development of the preferred alternative and final ORTP for the year 2035.

1.2 Report Overview

The problems and issues presented in this report are organized by the goals and objectives that have been identified for ORTP 2035. Five overarching goals were defined for this project, along with 25 supporting objectives. The problems and issues identified in this report are arranged under the following categories, along with their respective goals and objectives:

- Transportation Facilities
- Transportation Operations and Services
- Natural Environment
- Human Environment and Quality of Life
- Land Use and Transportation

The project team evaluated previous ORTP 2030 Technical Report and the ORTP 2035 work deliverables developed to help identify problems and issues. These included the following:

- 4.2.2 Goals and Objectives Report
- 4.3.2 ORTP 2035 Performance Measures
- 5.1.2 Multi-Modal Existing Conditions Performance Report
- 7.1.1 2035 Socio-economic Data Reasonableness Report
- 7.2.1 Baseline Projects List
- 7.3.2 Baseline Auto and Transit Travel Demand Forecasts Report
- 7.4.2 Baseline Forecast Analysis Technical Memorandum

2 Transportation Facilities

The goal for transportation facilities is to provide an inclusive, multi-modal transport system whose connectedness provides efficient means for users desiring to move about the island by bicycle, freight carrier, walking, automobiles, transit, or via intermodal connectors. Problems and issues have been identified associated with the following objectives.

Objective 1: *Develop, operate, and maintain alternative transportation facilities, including bikeways, walkways, and other accessible pedestrian, bicycle, and environmentally-friendly elements.*

- Some pedestrian access routes connecting to future fixed guideway transit stations will require improvements (outside of the improvements to the immediate station areas which will be done as part of the proposed transit project). Growth in population and employment in areas beyond termini of fixed guideway transit will encourage increased demand at termini stations. These include the Kapolei and Ala Moana terminals.
- Access to bus transit in many rural areas is poor due to lack of sidewalks.

Objective 2: *Enhance the integration and connectivity of the regional transportation system; and*

Objective 3: *Provide efficient, convenient, and cost-effective transit service to Oahu's citizens.*

- With increased development and roadway congestion inhibiting bus transit, some areas will suffer a decrease in transit level of service. This includes both the Waianae and Central Oahu areas.
- Existing bus service is well utilized; however, this leads to overcrowding on buses during peak times in many of the primary bus corridors.
- Bus vehicle throughput in downtown Honolulu (e.g., Hotel Street, King Street and Beretania Street) as well as on Kona Street at Ala Moana Center is at capacity during the peak periods.
- Congestion on the streets serving bus routes makes it difficult for buses to maintain their headways.

Objective 4: *Promote the intermodal efficiency of harbor terminal facilities, airport terminal facilities, and land transportation systems.*

- Roadways connecting the growing industrial area of Kalaeloa/Barbers Point with H-1 are projected to operate at LOS E and F in 2035. This is of particular concern for freight movements to and from the area.

Objective 5: *Provide rehabilitation, renewal, and modernization of facilities in sufficient magnitude to ensure system preservation and continued, effective operation.*

- Level of investment in roadway maintenance funding levels is not keeping pace with rehabilitation needs.

3 Transportation Operations and Services

The goal for transportation operations and services is to develop, operate, and maintain Oahu's islandwide transportation system to ensure the efficient, dependable, safe, secure, convenient, and economical movement of people and goods. Problems and issues have been identified related to the following objectives.

Objective 1: *Promote planning, design, operation, maintenance, and construction of transportation facilities and systems to support economic development and vitality.*

- Farrington Highway in Waianae is consistently LOS E and F in the 2007 base year. These conditions are somewhat worse in the PM, and the roadway is susceptible to blockages by incidents at all times. Conditions on this portion of Farrington Highway are projected to get worse in 2035 as the length of projected roadway at LOS F increases. This is consistent with the projected 26 percent increase in number of households for this area.
- The "reverse" commute in the H-1 corridor is likely to become much more pronounced due to the significant increase in employment projected for the Ewa-Kapolei areas. The effect may be exacerbated by the reduced capacity in the off-peak direction caused by the zipper lane operations.
- Though the OahuMPO travel demand model indicates a slower rate of traffic growth for the H-1 corridor between Ewa and the Middle Street Merge as compared to overall islandwide growth in trips, these segments (both H-1 and H-201) will continue to be problem areas with heavy traffic flows inbound in the AM peak period and outbound in the PM peak period.
- H-1 between the Middle Street Merge and University Avenue will continue to be congested in both directions throughout many hours of the day due to heavy volumes coupled with high levels of weaving, merging and diverging movements.
- H-2 Makai-bound in the AM peak period between Ka Uka Boulevard, and the Waiawa Merge will continue to be a problem area due to back-ups emanating from the Waiawa Interchange.
- Moanalua Freeway (H-201) between Puuloa Road and the Middle Street merge will continue to be a problem area due to heavy volumes and back-ups from the Middle Street Merge.
- Windward area residents using H-3 southbound in the AM peak to H-1 to commute to Ewa for work and returning on H-3 northbound from H-1 in the PM peak will add to the already congested H-1 corridor (LOS E in the AM

peak period based on projected volume to capacity ratios). This is a result of the 40 percent more work trips that are projected from the Windward areas to the Leeward areas in 2035 as compared to today..

- Nimitz Highway, North King Street, and Dillingham Boulevard all exhibit relatively congested conditions under existing conditions (LOS E and F in the AM peak period), and are projected to remain congested in the 2035 baseline scenario (LOS E and F). This is particularly important for freight movements which utilize Nimitz Highway to access both Honolulu Harbor and Honolulu International Airport.
- Traffic on Kahekili Highway (Route 83) on the Windward shore backs up from Haiku Road to Hui Iwa Street on a regular basis due to the lane configuration going from 2 lanes to 1 lane in each direction at Haiku Road (LOS F in both existing conditions and 2035 baseline).

Objective 2: *Optimize transportation resources through Transportation Demand Management (TDM) strategies, including telecommuting solutions, to encouraging transit ridership and ridesharing, while reducing single-occupancy vehicle travel and auto dependency.*

- TDM strategies will remain critical to help reduce single occupant vehicle travel on the island.

Objective 3: *Encourage public-private partnerships in providing transportation services.*

- The ORTP 2035 plan should seek innovative public-private partnership opportunities in order to maximize limited public resources.

Objective 4: *Monitor and enhance the performance and efficiency of Oahu's transportation system through the use of operation management strategies, such as Intelligent Transportation Systems (ITS), Transportation System Management (TSM), TDM, and the OahuMPO Congestion Management Process (CMP).*

- ITS/TSM projects will remain critical to enhance mobility on the island. The ORTP 2035 plan should include ITS/TSM projects in order to enhance the effectiveness and efficiency of the regional transportation system.
- Expansion of traffic monitoring technologies to regional transportation facilities not currently monitored by HDOT or DTS should be considered to improve operations on these facilities.

Objective 5: *Ensure that Oahu's transportation system is planned, designed, constructed, maintained, and operated in an integrated and cost-effective manner.*

- Model results indicate very good LOS (LOS A and B) in the Kakaako, Downtown, and Ala Moana areas in both 2007 and the 2035 baseline. However, the model is not reflecting the true levels of congestion along key roadways such as Ala Moana Boulevard that can be observed today

(LOS E). This is a limitation of travel demand models in general in that they cannot fully reflect congestion related to signalized intersections and associated queuing issues. Though this area has relatively high levels of transit service (including the fixed guideway project) for the 2035 baseline condition, which may reduce some general purpose auto travel, given the very high population growth projected for the Kakaako area (i.e., an additional 26,900 people by 2035), Ala Moana Boulevard and other streets in this area are expected to remain at relatively congested levels during the peak periods in 2035 as no highway capacity improvements were modeled in this area.

Objective 6: *Ensure user and community safety, and practical systems for the disabled by incorporating the priorities, programs, physical design and operation of transportation facilities, and other improvements, consistent with the Hawaii Strategic Highway Safety Plan and Americans with Disabilities Act Accessibility Guidelines.*

- Regarding safety on state routes, the highest number of crashes (27 in three years) occurred at Likelike Highway (Route 63) and the junction with the northbound off-ramp to Kahekili highway (Route 83). Thirteen of the 35 high accident locations on state routes islandwide exist on Route 92, which includes sections of Nimitz Highway and Ala Moana Boulevard
- For city streets, the highest number of crashes (50 in three years) occurred at the intersection of Beretania Street and Alakea / Queen Emma Street. Other locations had less than 25 crashes during this time period. The arterial corridor with most high accident locations is Kapiolani Boulevard followed by King Street and Beretania Street.

Objective 7: *Increase the peak-period, person-carrying capacities of Oahu's transportation network.*

- In 2035 many regional transportation facilities will be at or above capacity with limited opportunities for expansion. Careful consideration should be given to programs and strategies that will expand the person-carrying capacity of the current system.

Objective 8: *Reduce security risks associated with terrorism and other criminal acts, natural and man-made disasters, and other emergencies that would impact the transportation system.*

- The island-wide transportation system, as it evolves, may encounter threats to facilities and services operations due to natural or man-made disasters. Programs to reduce the risk of these occurrences continue to remain essential as well as strategies to address potential impacts to the system.

4 Natural Environment

The goal for natural environment is to develop, operate, and maintain Oahu's transportation system in a manner that sustains environmental quality. Problems and issues have been identified related to the following objectives.

Objective 1: *Develop, operate, and maintain Oahu's transportation system to meet or exceed noise, air, and water quality standards set by Federal, State, and City agencies.*

- Future increases in population and employment will put a strain on the ability to meet Federal, State, and City environmental regulations. This may result in additional costs to projects in order to meet these standards.

Objective 2: *Maximize energy conservation in transportation and reduce greenhouse gas emissions.*

- The 2035 Baseline alternative is projected to result in a 24 percent decrease fuel consumed and a 29 percent decrease in CO2 emissions compared with the 2007 base year for the modeled roadways. The 24 percent decrease in gallons of fuel consumed is directly related to the assumed increase in fleet fuel efficiency between 2007 and 2035, which will offset increases in vehicle miles of travel over the same time period.

Objective 3: *Maintain and upgrade existing facilities and locate and design future transportation facilities in a manner that protects them from significant damage or disruption due to global climate change.*

- Transportation facilities that are within close proximity to coastal areas, such as two commercial harbors, the airport, and various streets and highways, will still be at risk of impacts from global climate change in Baseline 2035 conditions.

Objective 4: *Preserve and enhance Oahu's cultural integrity, including archaeological and historic sites, and sensitive natural resources, including beaches, scenic beauty, and sea and mountain vistas.*

- Anticipated future development pressures will increase the potential for impacting sensitive areas on Oahu.

5 Human Environment and Quality of Life

The goal for human environment and quality of life is to develop, operate, and maintain Oahu's transportation system in a manner that supports community-wide values related to health, safety, and civil rights. Problems and issues have been identified related to the following objectives.

Objective 1: *Address and minimize the impacts of energy shortages, natural or man-made disasters, and other emergencies to the transportation system.*

- State and local governments will continue to remain vigilant in planning for and dealing with major emergencies that impact the use of the island's multimodal transportation system. Strategies to reduce the risk of impacts from these emergencies will need to consider a number of factors including, but not limited to, availability of alternate travel routes, ability of transportation system operators to quickly respond to emergencies and the ability of transit system and private transportation systems to provide service to meet increased demand.

Objective 2: *Encourage the development of sustainable and renewable energy sources for transportation.*

- The drive to implement sustainable and renewable energy sources for transportation is growing. Most transportation vehicles are powered by finite petroleum-based fuels, though pressures to reduce use of these fuels, whether to reduce the nation's reliance on fossil fuels or to reduce the amount of pollutants in the atmosphere are encouraging changes in vehicle propulsion technology. Travelers on the island of Oahu will likely see more options available for powering their vehicles in the coming years as auto companies bring these new technologies to the mass market. Transit systems across the U.S., including Honolulu, are already beginning to deploy cleaner fueled buses or hybrid buses, both of which help reduce emissions and energy consumption. These opportunities, while good for the planet, may come at a high cost for cash-strapped local governments.

Objective 3: *Ensure that no person shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination in transportation services as provided for under current Federal, State, and City legislation.*

- Accessibility to colleges and employment centers is projected to continue to be better for non-T6/EJ populations than for T6/EJ populations in 2035, similar to existing conditions.
- Mobility is projected to become worse for T6/EJ populations in 2035 baseline conditions when compared with non-EJ populations. The differential in average auto travel times to employment centers between T6/EJ and non-T6/EJ populations is projected to increase from 15-to-19 minutes, and the differential in average transit travel times is projected to increase from 21-to-26 minutes.

Objective 4: *Maintain and upgrade existing facilities and design future transportation facilities in a manner that complies with local urban design policies and regulations.*

- The challenge here is that local urban design policies tend to evolve over time and existing facilities may not comply with new regulations. Efforts to maintain and upgrade facilities will incur higher cost in order to meet new policies, e.g., if maintenance includes retrofitting to meet updated design standards.

Objective 5: *Encourage innovation in planning, design, construction, operation, and maintenance of transportation services and facilities.*

- The development of new, or rehabilitation of existing, urban transportation infrastructure on Oahu will be done in light of new realities facing our planet. Increasing cost for fossil fuels, world-wide demands on resources needed for construction materials, and higher costs for land and labor pose many challenges for implementing agencies. Old ways of doing business may not be sufficient to meet the changing dynamics affecting project development or system maintenance on Oahu.

Objective 6: *Minimize disruption to existing neighborhoods from construction and maintenance of the transportation system.*

- H-1 freeway, the rail, road, and other projects will continue to have adverse impacts during project construction. The challenge for the project-implementing agencies will be to coordinate efforts closely to minimize traffic, noise, and other impacts.

6 Land Use and Transportation

The goal for land use and transportation is to develop, operate, and maintain Oahu's transportation system in a manner that integrates effective land use and transportation with established sources of funding in a fair and equitable manner. Problems and issues have been identified in relation to the following objectives.

Objective 1: *Develop, operate, and maintain the transportation system to support Oahu's planned population distribution and land use development policies expressed in the City's General, Development, Sustainable Communities Plans, and other adopted plans through coordinated efforts of both public and private sectors.*

- The Second City (Kapolei), it is projected to materialize as indicated by the future socio-economic patterns (the number of households in 2035 is projected to increase by 121 percent over 2007 in the Ewa and Kapolei area, while the number of employees is projected to increase by 162 percent over 2007). The number of work trips for those who live and work in the Ewa and Kapolei area will increase by nearly 210 percent in 2035 over 2007. There will also be 85 percent more work trips to Ewa and Kapolei from the other areas of Oahu. Thus there is potential for Kapolei residents to work elsewhere and Kapolei employees to live elsewhere, perhaps putting a greater burden on the H-1 corridor.
- Provision of the necessary transportation infrastructure to support the planned growth in the Ewa-Kapolei area is an issue. Many of the primary internal roadways are to be built by developers as their particular developments come on line. Due to differing timelines among developers/developments, there may be gaps in the transportation network for significant periods of time impacting the ability of the facilities to provide their necessary function. A question is whether additional public investment is required if the approach of having developers provide the infrastructure is not working effectively.
- The Waiawa-Koa Ridge area, with a projected increase of nearly 35,000 people by 2035, has the largest percent increase in population on the island. Traffic on H-2 (LOS B in 2007 to LOS D in 2035 baseline) and Kamehameha Highway (LOS E in 2007 to LOS F in 2035 baseline) will be significantly impacted without other roadway additions to provide access to/from the area, as well as circulation between developments within the overall area.

Objective 2: *Support land use development policies, such as Transit-Oriented Development, that capitalize on the efficient use of the transportation system and reduce vehicular trip-making and vehicle miles traveled.*

- The Honolulu rail project presents opportunities for encouraging transit-oriented development in station areas. In conjunction with this, it will be important to maximize access to the rail system for pedestrians, bicyclists and bus transfers.

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