

Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii



Prepared for:
State of Hawaii
Department of Transportation
Highways Division



July 2014

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The State of Hawaii is committed to modernizing our highway systems to meet the future needs of our people. Our state Department of Transportation has completed the *Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii*, providing a solid foundation for making informed land transportation planning decisions through the year 2035. The benefits of this present-day work will be critical to Hawaii's future goals of modernizing our transportation systems, improving safety on our highways, and meeting our ambitious, yet obtainable, sustainability goals.

Public involvement and community input were key components in the planning effort, which embraced the unique social, cultural, and historical values of the people of Hawaii. Our sincerest thanks go to all of our citizens and stakeholders who participated in the process and provided their valuable insight.

The Plan develops not only goals and objectives for transportation improvements, but also sets performance standards by which success will be measured. This performance gauge will allow for an objective and unbiased assessment of proposed improvements before they are implemented, streamlining and reducing waste throughout the process.

This Plan is an important step forward towards ensuring that transportation improvements can be implemented long-term in fiscally responsible and timely fashions. We will continue our collaborative efforts in our communities statewide to meet our future needs.

Sincerely,

Neil Abercrombie
Governor
State of Hawaii



The federal-aid highways system is the central transportation network that allows for the efficient movement of people, goods, and services on the Island of Hawaii. If the system cannot keep up with demand, we feel the effects in our schedules, our pocketbooks, and throughout our daily lives. The *Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii* is a vital addition to our Highways Division planning toolkit and will provide guidance for our long-term improvements to ensure that our highways can continue to meet future demands.

The Plan will focus on increasing highway safety for freight, motorists, transit, cyclists, and pedestrians, and on supporting our local economy and environment. It will also promote systemwide efficiency, accessibility, and mobility for all users. Setting these fundamental priorities in advance of specific planning efforts will ensure that improving our quality of life will be a central motivator in all of our projects.

Development of this Plan has been driven by community members and stakeholders who participated in the planning process. We would like to extend a special mahalo to each of these individuals who took the time to contribute their experiences and input.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ford Fuchigami". The signature is fluid and stylized, with a long horizontal stroke at the end.

Ford Fuchigami
Interim Director
State of Hawaii
Department of Transportation

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Acronyms and Abbreviations

FHWA	Federal Highway Administration
FY	fiscal year
HDOT	State of Hawaii Department of Transportation
LOS	Level of Service
MAP-21	Moving Ahead for Progress in the 21st Century
PC	Policy Committee
SAC	Stakeholder Advisory Committee
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
STIP	Statewide Transportation Improvement Program
TAC	Technical Advisory Committee
TAZ	traffic analysis zone
TEU	twenty-foot equivalent unit
USC	United States Code
V/C	volume-to-capacity





Chapter I

Introduction and Overview

I. Introduction and Overview

The federal-aid highways are the backbone for moving people and goods around the Island of Hawaii. This roadway system is used by all modes of land transportation, including

freight, motorists, transit, bicyclists, and pedestrians. It is used for commuting, shopping, recreation, freight transport, visiting family and friends down the road, sightseeing, and by the military. It ties together the various communities and towns on the island so that its people can live, work, and play. Due to its ability to carry high volumes of vehicles and freight and provide regional movements, it is critical to supporting Hawaii's economic vitality and provides a lifeline when natural disasters strike.



Plan Purpose

The roadway system serves the people, the communities, the land uses, and the economy of the Hawaii District and is vital to a sustainable Hawaii. However, the resources required to address the projected land transportation needs for Hawaii District, and for the state as a whole, far exceed the available funds. By Year 2035, the estimated cost to address identified transportation needs would be nearly \$7.4 billion (2011 dollars). The Hawaii District is estimated to receive less than \$1.2 billion in future state and federal funding, which would result in a funding shortfall of over \$6.2 billion.

Furthermore, with recent federal legislation placing an emphasis on highway system preservation and infrastructure maintenance, this limited funding must be sensibly allocated to appropriately address transportation needs comprehensively. As a result, high-cost projects, such as those that increase capacity by adding lanes to existing roads or by constructing new roads, must be carefully compared against other, often less costly, projects.

Under this fiscal reality, it is essential to develop this long-range Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii (Plan) to incorporate technical input and community values and to guide decision makers in setting funding priorities.

This Plan is an update of the existing Hawaii Long-Range Land Transportation Plan that was developed in 1998, and will guide land transportation decisions for the federal-aid highway network on the District of Hawaii through Year 2035. By defining goals and needs and recommending multimodal solutions specific to Hawaii District, it sets the direction for land transportation system improvements for which priorities and funding can be developed.

Not only will this Plan set the direction for Hawaii District, it is a federal requirement as stated in Title 23, Sections 134 and 135 of the United States Code. Section 134 governs metropolitan and regional transportation planning, while Section 135 governs statewide planning. Both sections highlight the need for statewide and regional planning efforts to be coordinated, and Section 134 specifically sets forth a policy that states:



It is in the national interest to encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and between States and urbanized areas.

This regional Plan is developed in alignment with federal laws, thereby providing a link between statewide and regional planning efforts.

The Plan is based on input from the Hawaii District community and county land use and transportation plans, policies, and programs to ensure it is consistent with the vision of Hawaii District's communities and is functionally integrated with the county's transportation system.

Based on a consistent set of statewide goals and objectives formulated by stakeholders and the public, stakeholders identified several goals for their land transportation system that carried more weight than others in reflecting their community's values and priorities:

- Improve capacity and system efficiency by addressing congestion
- Maintain and improve safety for all modes
- Expand and increase Hawaii District's economic vitality
- Preserve and maintain the existing transportation system
- Provide modal integration and improve transit service
- Support evacuation and emergency access/egress during incidents

This Plan only applies to the ***federal-aid highways*** on the Island of Hawaii. The federal-aid highways are the National Highway System and all other public roads, except those federally classified as local roads or rural minor collectors.

Federal-aid highways are critical to providing for mobility for regional movements; linking major sites such as airports, harbors, industrial areas, military facilities, major communities, and primary urban centers; and supporting commuter and freight travel.

For the federal-aid highways, federal policy directs the State of Hawaii Department of Transportation (HDOT) to establish a classification of roads, based on function, so that roadways can be improved appropriately as funding opportunities arise (see Exhibit 1-1). This functional classification groups streets and highways into classes, or systems, according to the character of service they are intended to provide.

State and county roadways categorized as National Highway System facilities are important federal assets and are identified as:

- Route 11 (Hilo), Kanoiehua Avenue between Kamehameha Avenue and Old Keaau-Pahoa Road
- Route 11 (Kona), Mamalahoa Highway between Captain Cook Village Road and Palani Road
- Route 19, Hawaii Belt Road between Kuhio Wharf and Palani Road
- Route 270, Kawaihae Road between Queen Kaahumanu Highway and Maluokalani Street
- Route 1370, Kalaniana'ole Avenue between Kuhio Street and Pua Avenue



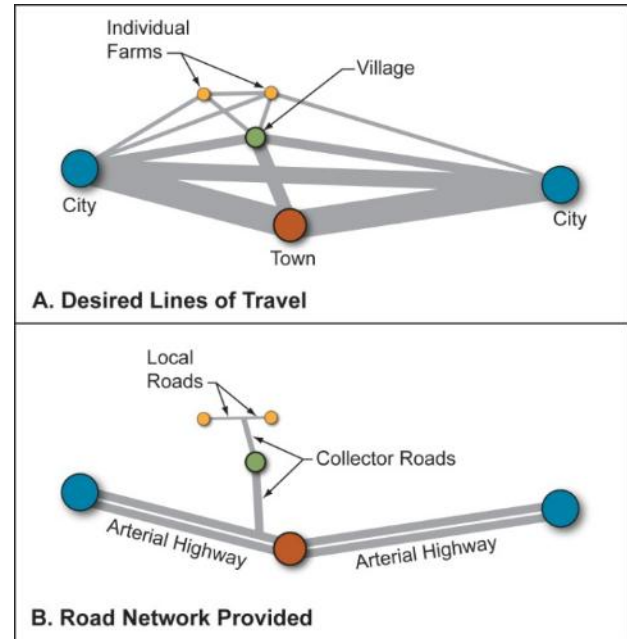
Exhibit 1-1. Federal Functional Classification
Functional classification uses a common nomenclature to provide a consistently defined roadway network across the country.

Principal Arterials:
Interstate
Other Freeways and Expressways
Other Principal Arterials
Other types of roadways:
Minor Arterial
Major Collector
Minor Collector
Local

All highways in the United States are functionally classified by state Departments of Transportation (in conjunction with local agencies) based on criteria established by the Federal Highway Administration (FHWA). Functional classification is used for planning, design, budgeting, programming, and fiscal management. For example, functional classification is used in determining federal, state, regional, and local priorities for roadway resurfacing or reconstruction. It also determines the eligibility for some FHWA funding categories.

Exhibit 1-2 shows how functional classification defines the nature of how travel can be channeled within a network in a logical and efficient manner by defining the part that any particular road or street should play in serving the flow of trips through a highway network.

Exhibit 1-2. Channelization of Trips



Exhibits 1-3 and 1-4 illustrate the highway functional classification on the Island of Hawaii. Functional classification area map insets are provided in Appendix A.



Exhibit 1-3. Highway Functional Classification Map of Hawaii District – MAP 1

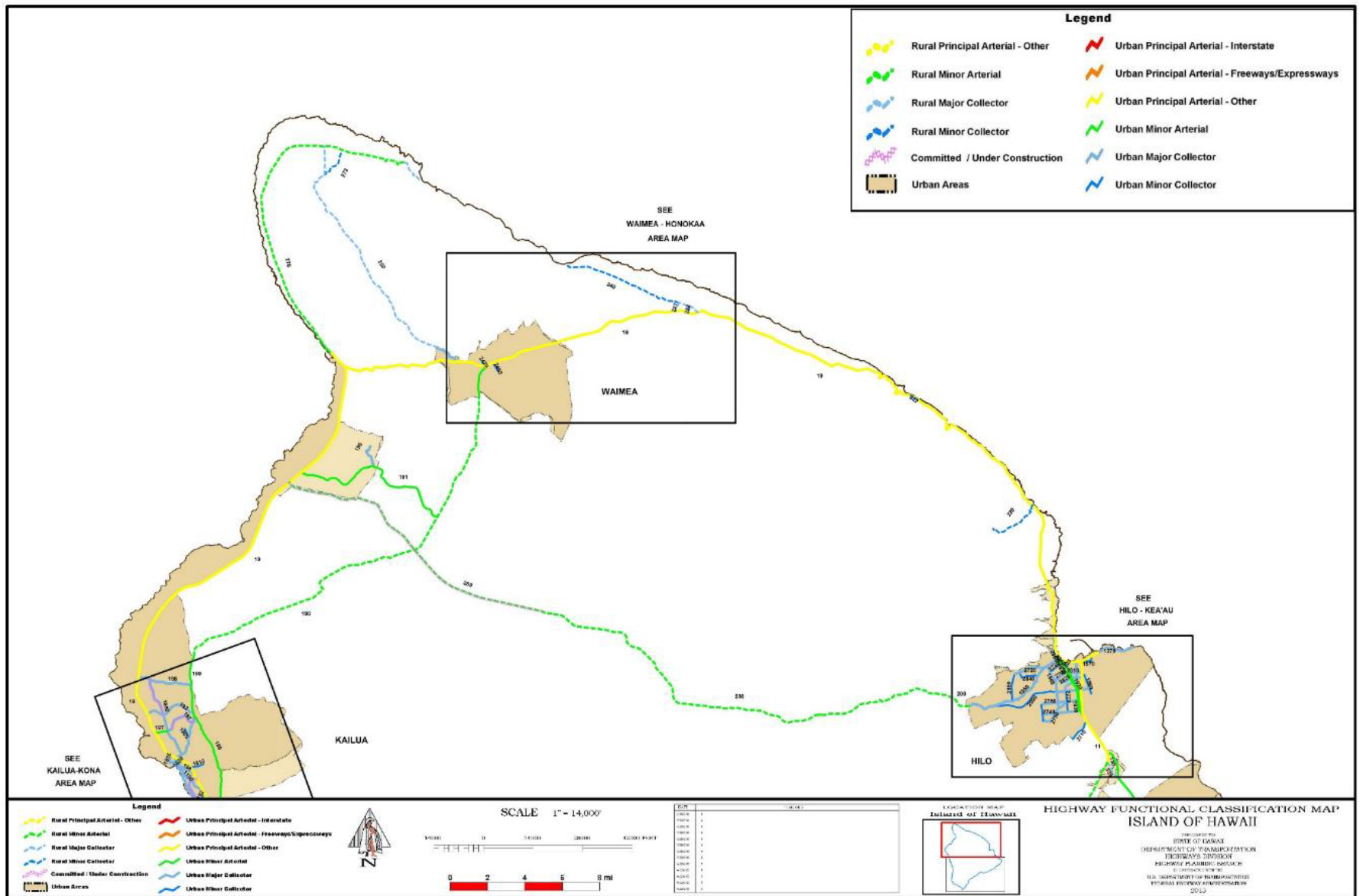
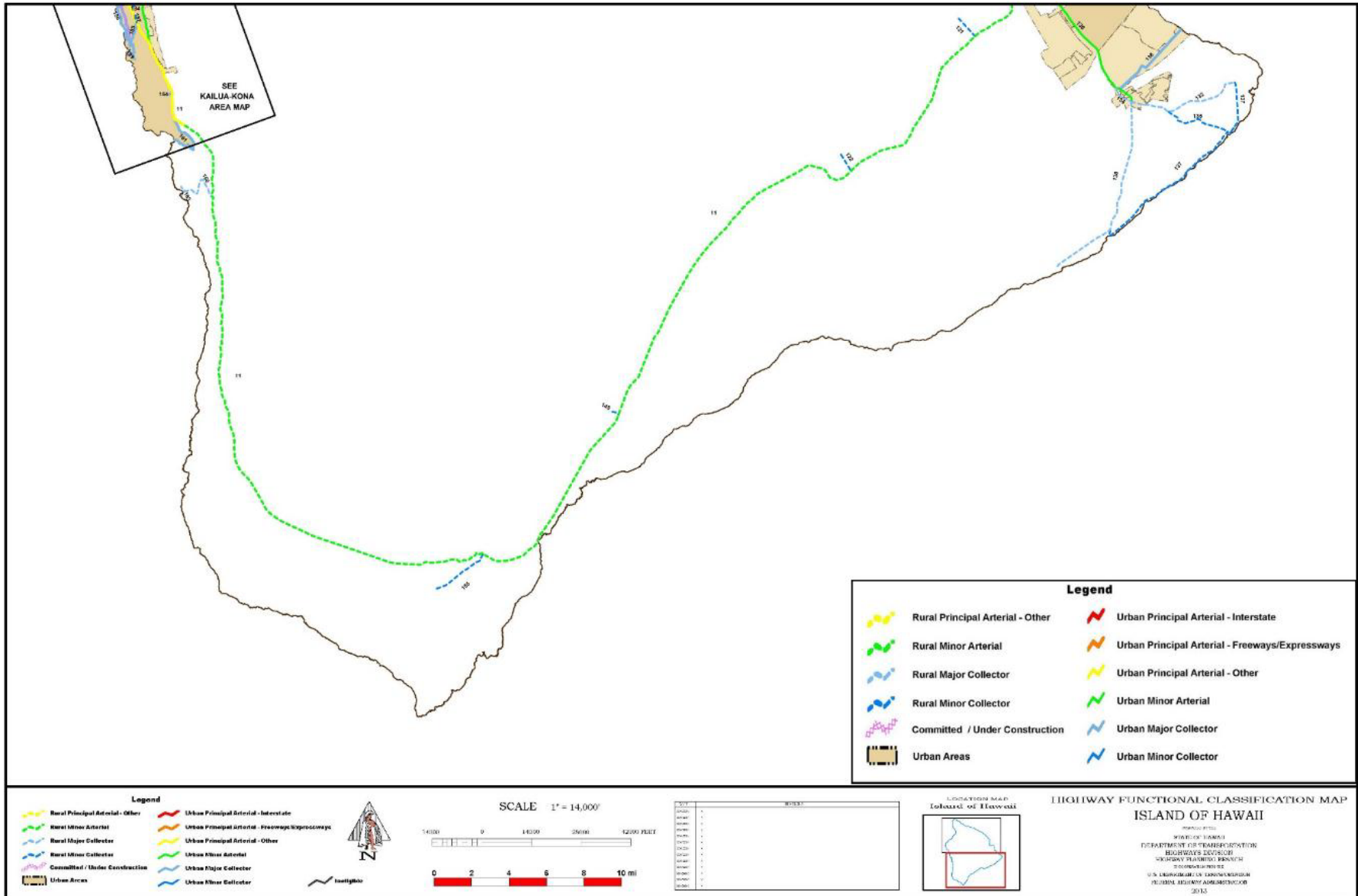


Exhibit 1-4. Highway Functional Classification Map of Hawaii District – MAP 2



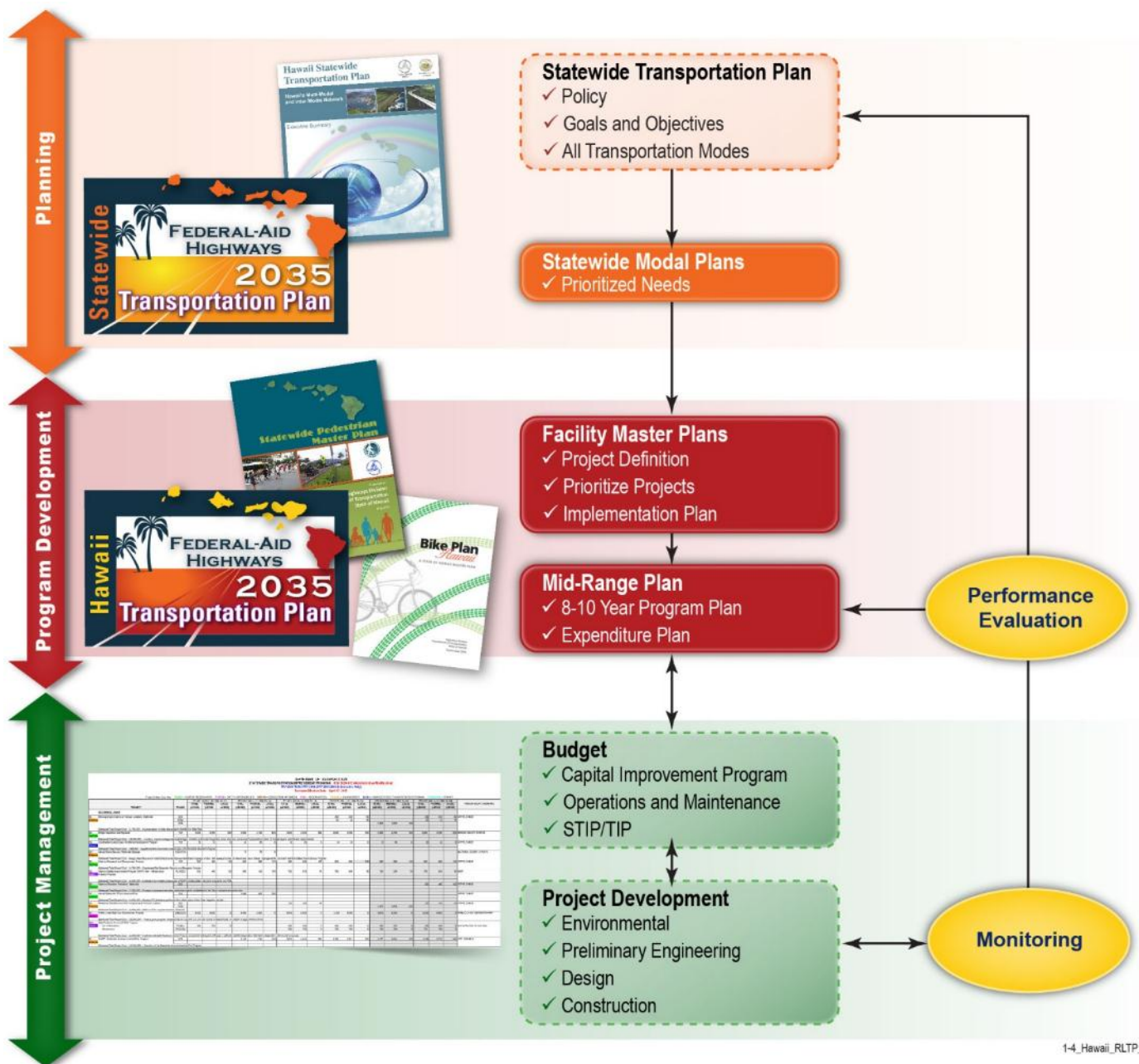
Relationship to Statewide Transportation Planning Process

Each district in the state has a Regional Federal-Aid Highways 2035 Transportation Plan. It is a regional long-range land transportation plan. The Plan integrates with the overarching Statewide Federal-Aid Highways 2035 Transportation Plan. The purpose of all of these plans is to provide a basis for making informed multimodal land transportation decisions over the next 20 years in an economic environment with limited funding.

These planning documents also fulfill federal and state requirements to formulate long-range transportation plans for the development of a multimodal transportation system within the state through a continuing, cooperative, and comprehensive statewide multimodal transportation planning process.

This Plan accomplishes specific components of the overall HDOT statewide transportation planning process. A summary of the planning process and hierarchy of components is shown on Exhibit 1-5.

Exhibit 1-5. Statewide Integrated Transportation Planning



1-4_Hawaii_RLTP_3_DEN



The top row of the exhibit, *Planning*, represents high-level planning efforts. It includes the Hawaii Statewide Transportation Plan, which focuses on broad policy, goals, and objectives for all transportation modes. It provides guidance to system level and facility master plans of the three primary modes of transportation—the air, water, and land systems—as well as the nonmotorized modes and intermodal connections.

The next component in the *Planning* level is the statewide modal plans (orange box) that set forth overarching goals and ensures equity and consistency among the regional plans. This includes the Statewide Federal-Aid Highways 2035 Transportation Plan, Harbors Master Plan, and Airports Master Plan.

The middle row of the exhibit, *Program Development* (red boxes), is where this Plan fits within the planning process as a facility master plan, in this case a regional land transportation plan. It presents recommendations, prioritizations, and documentation for mid-range and long-range components that implement the Plan. Other plans within this level include Bike Plan Hawaii and the Statewide Pedestrian Master Plan.

The bottom row of the exhibit is *Project Management*. This includes budgeting (that is, the Statewide Transportation Improvement Program [STIP] process) and Project Development. It is at this last step of the overall process where individual projects are permitted, designed, and constructed.

Plan Development Process

The Plan was formulated through a series of milestones in an open and comprehensive process that developed goals, objectives, and strategies before identifying potential solutions. This process allowed the planning team to objectively evaluate alternative solutions and assess how well they met the goals and objectives defined by stakeholders.

Decision-makers, advisory committees, and the general public were included throughout the process to ensure quality decisions. Clearly identifying plan milestones

allowed stakeholders to visualize the entire process and identify points at which to provide input. Development of the regional and statewide plans proceeded concurrently in an integrated process to ensure consistency among the statewide and regional plans, policies, and programs. The major plan milestones are shown on Exhibit 1-6.

Establish Goals and Objectives – This milestone focused on reviewing existing regulatory and policy requirements related to land transportation, and developing project goals and objectives for the long-range land transportation system.

Gather Data and Develop Model – This milestone included gathering data and information related to the land transportation system and current HDOT programs. A major portion of the task included developing/updating the regional travel demand models, which were the basis for forecasting and assessing future traffic conditions.

Define Future Conditions – Based on the forecasting results and endorsed program definitions, this milestone focused on identifying future system deficiencies and developing the plan priorities and evaluation criteria.

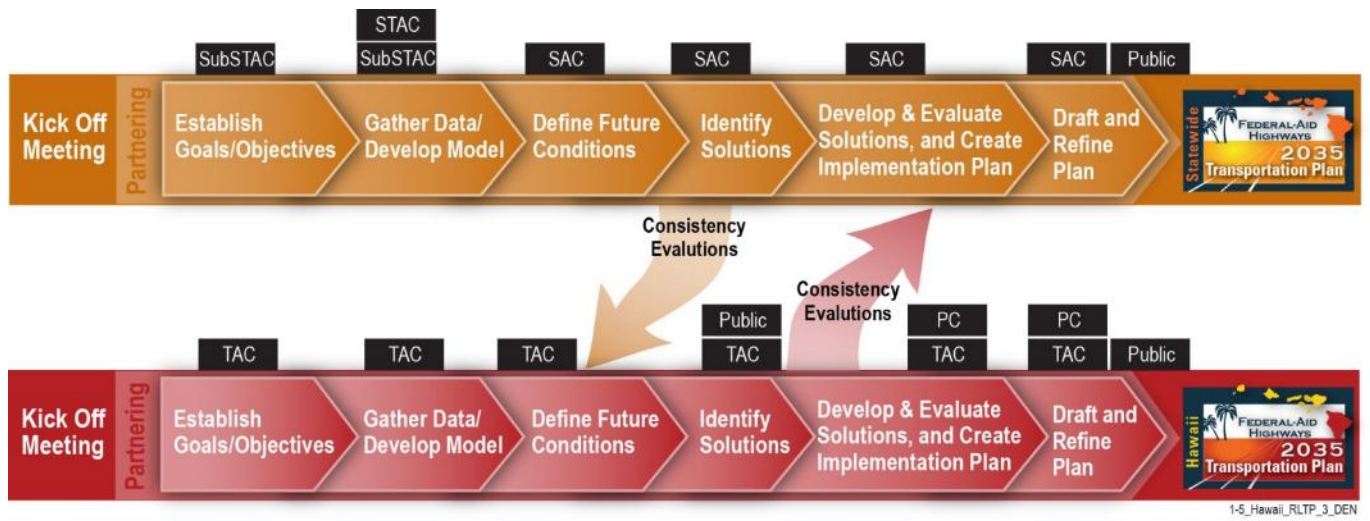
Identify Solutions – This milestone focused on developing potential solutions to address overall plan policies, goals and objectives, and identified transportation needs and deficiencies. Funding sources, allocations, and financing strategies were also identified.

Develop and Evaluate Solutions and Create Implementation Plan – This milestone focused on evaluating the potential solutions against requirements and plan goals and objectives and creating implementation recommendations.

Draft and Refine Plan – This milestone documented the plan development process, analyses, and recommendations for the Plan. The document was refined and finalized based on stakeholder comments and input.



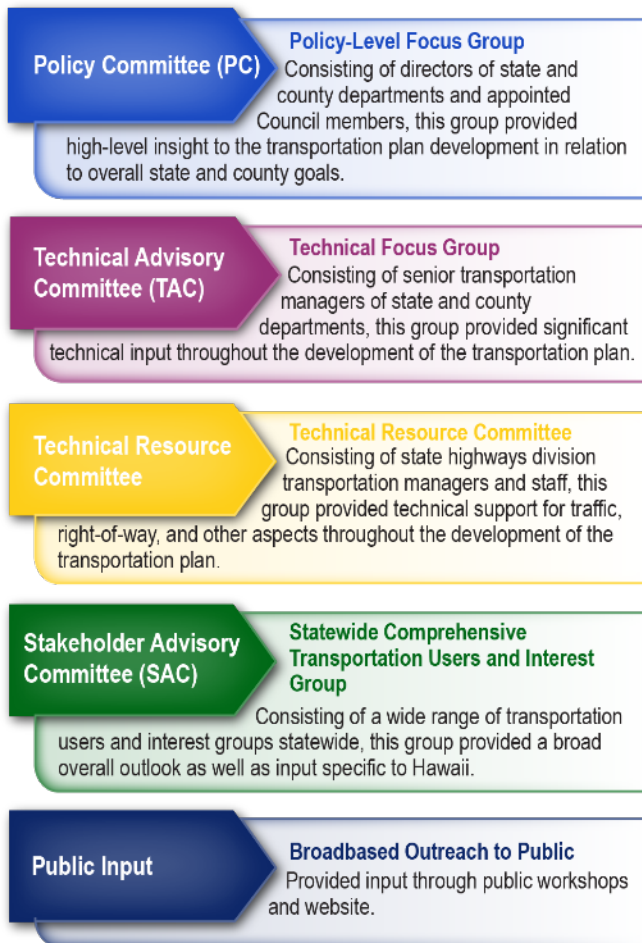
Exhibit 1-6. Plan Development Process



Stakeholder Involvement

Stakeholder involvement was vital to the development of this Plan. Stakeholders provided diverse viewpoints at specific milestones in the plan development process and helped shape the direction of the Plan. The stakeholder groups, roles, and responsibilities for the Plan are described on Exhibit 1-7.

Exhibit 1-7. Stakeholder Groups, Roles, and Responsibilities



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Stakeholder Groups

Policy Committees (PC) - The PC provided high-level insight to the transportation plan development in relation to overall state and county goals. The PC included directors of the HDOT and County Planning, Public Works, and Transit departments.

Technical Advisory Committee (TAC) - The TAC provided significant technical input throughout the development of the Plan. Membership consisted of senior transportation managers from the HDOT and County of Hawaii departments. TAC member organizations are shown on Exhibit 1-8.

Exhibit 1-8. TAC Member Organizations

County of Hawaii
Department of Public Works
Planning Department
Mass Transit Agency
Fire Department
Civil Defense Agency
HDOT Highways Division
Hawaii District Office
Planning Branch



The TAC provided their input on Hawaii District's transportation issues.

Technical Resource Committee – The group consisted of state highways division transportation managers and staff who provided technical support for traffic, right-of-way, and various other aspects.



Statewide Stakeholder Advisory Committee (SAC) – The SAC represented a wide range of transportation user categories and interest groups statewide and provided broad, overall feedback and input to district-specific issues. SAC interest groups are listed on Exhibit 1-9.

Exhibit 1-9. SAC Interest Groups

Transit	Military
Freight	Utilities
Car	Environment
Pedestrian	Sustainability
Bicyclist	Energy
Visitor Industry	Cultural
Business Community	Disabled Persons
Residential Community	Safety
Development Community	Elderly
School	Health
Higher Education	

Public Input - The planning team used a variety of public involvement and outreach methods to communicate with the public. These techniques were intended to reach a comprehensive cross section of the community and transportation system users and allow them to provide meaningful and broad-based input. The public involvement process was tailored to fit each district through district-specific public involvement specialists.



Input from the general public was gathered at public meetings.

Public Meetings – In addition to the comprehensive committee structure, the general public provided input to shape the Plan through two rounds of public workshops. The first round of workshops was held in late February, 2012 in both Hilo and Kona. The intent of these workshops was to identify needs and opportunities in the transportation system. Another round of meetings in March, 2014 was conducted to review the draft Plan.



Public meetings were held in Hilo and Kona.

Electronic Media – A web page was developed to give the public a convenient way to stay informed about the plan’s progress and stakeholder involvement opportunities. It includes the following information:

- Plan overview and schedule
- Planning framework
- Plan status
- Plan information and materials
- Announcements of public meetings

The website also included a comment page, which allowed the public to submit comments directly to the planning team. In addition, a Facebook page was created to broadcast project updates to Facebook users and direct them to the project website for more information.





Chapter II

Goals and Objectives

II. Goals and Objectives

Goals and objectives set the basic vision for any planning process and provide a framework for evaluating success once the Plan has been implemented.

Defining Goals and Objectives

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii was developed concurrently with the Statewide Federal-Aid Highways 2035 Transportation Plan and the regional plans for districts of Maui and Kauai.¹ A single set of goals, objectives, and strategies were developed for the statewide and regional plans to ensure statewide consistency. However, goal priorities were developed by region to reflect each region's values. Plan goals were developed using the process described below:

- Federal, state, and county plans, policies, and programs were reviewed to ensure compliance and alignment with adopted plans and requirements.
- The federal planning factors were used as a framework to ensure a comprehensive plan that addressed federal requirements.
- The planning team worked with the TAC and SAC to develop and refine the goal statements through an iterative process.
- The goals were weighted at a regional level to determine specific local issues important to address in the regional plans.

The state began the long-range planning process when SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) was the current federal legislation. Since formulation of the plan goals, MAP-21 (Moving Ahead for Progress in the 21st Century) replaced and supplemented parts of SAFETEA-LU in July 2012. Therefore, the planning team checked for consistency of the goals and objectives with MAP-21 to ensure the Plan aligned with MAP-21

performance goals as codified in 23 United States Code (USC) Section 135.

Each step in the process will be described further in this Section.

Consistency with Plans, Policies, and Programs

The goals and objectives for the Plan are aligned with existing federal, state, and local regulatory and policy requirements. Relevant plans, policies, and programs were reviewed to identify potential focus areas of the Plan, and to understand guidance and direction for development of goals and objectives.

Exhibit 2-1 shows a subset of key federal, state, and local plans that were reviewed, and their relevance to the development of the Plan is described. A summary list of plans, policies, and programs that were reviewed is included as Appendix B.



Federal, state, and local plans were reviewed for consistency.

¹ The Oahu Metropolitan Planning Organization (MPO) develops the regional plan for Oahu under a different process.



Exhibit 2-1. Key Federal, State, and Local Plans Reviewed

<p>Federal Plans, Policies, and Programs</p>	<p>Federal law (23 USC 134) defines the general requirements for metropolitan transportation planning. It states that long-range plans shall consider all modes of transportation, and provide for an integrated, comprehensive transportation system. The Plan addresses all modes of transportation supported by the federal-aid system.</p> <p>MAP-21 prescribes certain elements of transportation planning by outlining national goals and performance measures for the federal-aid system. This legislation is intended to focus or streamline investments on programs or projects that are aligned with these national goals. Plan goals are consistent with multiple national MAP-21 goals.</p>	<p>Other plans, policies, and programs examined include:</p> <ul style="list-style-type: none"> • United States Code – Title 23 – Highways – Section 135 Statewide Transportation Planning • United States Code – Title 49 – Transportation – Section 5304 – Statewide Transportation Planning • Code of Federal Regulations – Title 23 – Highways – Part 450, Subpart B – Statewide Transportation Planning 	<ul style="list-style-type: none"> • National Response Framework – US Department of Homeland Security • Bicycle Resolutions, 110th Congress U.S. Conference of Mayors
<p>State Plans, Policies, and Programs</p>	<p>Statewide transportation policy and planning documents primarily address statewide transportation networks, including multimodal facilities. Statewide plans and policies provide a general policy framework for transportation planning and direction for project and program implementation (including guidelines and standards) for Hawaii state roadway facilities. These plans and policies can also serve as examples for counties as they develop their policies, guidelines and standards.</p>	<ul style="list-style-type: none"> • HRS 279 A Statewide Transportation Planning • Hawaii Statewide Transportation Plan (2011) • Disability and Communication Access Board Policy • Bike Plan Hawaii (2003) • Statewide Pedestrian Master Plan (2013) • Complete Streets Task Force (2010) • Federal-Aid and State Highway Update: System Identification and Functional Classification (2013) • Hawaii Strategic Highway Safety Plan 2007-2012 • State of Hawaii Multi-Hazard Mitigation Plan (2007) • Coordinated Public Transit Human Services Transportation Plan (2008) 	<ul style="list-style-type: none"> • Statewide Comprehensive Outdoor Recreation Plan 2008 Update • National Wildlife Refuges • National Parks • Department of Health – Active Living Workshops • Hawaii 2050 Sustainability Plan (2008) • Hawaii Tourism Authority Strategic Plan: 2010-2012 • Coastal Storms Program • Coastal Zone Management Program • Hawaii Department of Transportation Statewide Transportation Improvement Program (Current Update, FY 2011-2014 +2) • Report on the State of Physical Infrastructure in Hawaii (July 2010)



Exhibit 2-1. Key Federal, State, and Local Plans Reviewed

Local Plans, Policies, and Programs	<p>Local plans and policies are consistent with statewide policy. However, they are more specific than federal or state plans and policies and reflect unique regional priorities. The Plan is consistent with the general direction of local plans and policies in that it strives to provide a safe, multimodal transportation system for all users.</p>	<ul style="list-style-type: none"> • Hawaii County General Plan (2005) • Island of Hawaii Community Development Plans (2008) • Hilo Bayfront Trails Master Plan (2009) • Hawaii County Long-Range Land Transportation Plan (1998) • Hawaii Multi-Hazard Mitigation Plan (2005) • Hawaii Commercial Harbors 2020 Master Plan (1998) • Kona International Airport at Keahole Airport Master Plan (2010) 	<ul style="list-style-type: none"> • Hilo International Airport Master Plan (2002) • Waimea-Kohala Airport Master Plan (1999) • Upolu Airport Master Plan (1999) • Hakalau Forest National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment (Ongoing) • Ala Kahakai National Historic Trail (2009) • County of Hawaii Transportation/Capital Improvement Plan Capital Budget and Six-Year Capital Improvements Program FY 2010-2011
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Planning Factors

The Plan is developed around a set of eight federal planning factors that are intended to address transportation comprehensively.

The goals and objectives are aligned with each of the factors and reflect the desired outcome of the Plan. Planning factors and general criteria are described on Exhibit 2-2.

Stakeholder Input

For the regional and statewide plans, the TAC developed goal statements for each of the planning factor categories. The planning team worked extensively with the stakeholders to craft and refine these goal statements until they accurately reflected the various desires of each stakeholder group. Objectives and specific strategies were also discussed and refined.

The resulting goals and objectives are consistent with the federal goals found in 23 USC 135. The planning team included a ninth category to encompass goals that are not directly associated with the federal planning factors. This coordination and process provided consistency across the regional and statewide plans while also allowing goal priorities to vary by region to reflect each district's values. Appendix C contains the Goals, Objectives, and Strategies memorandum.

Weighting Goals for Hawaii District

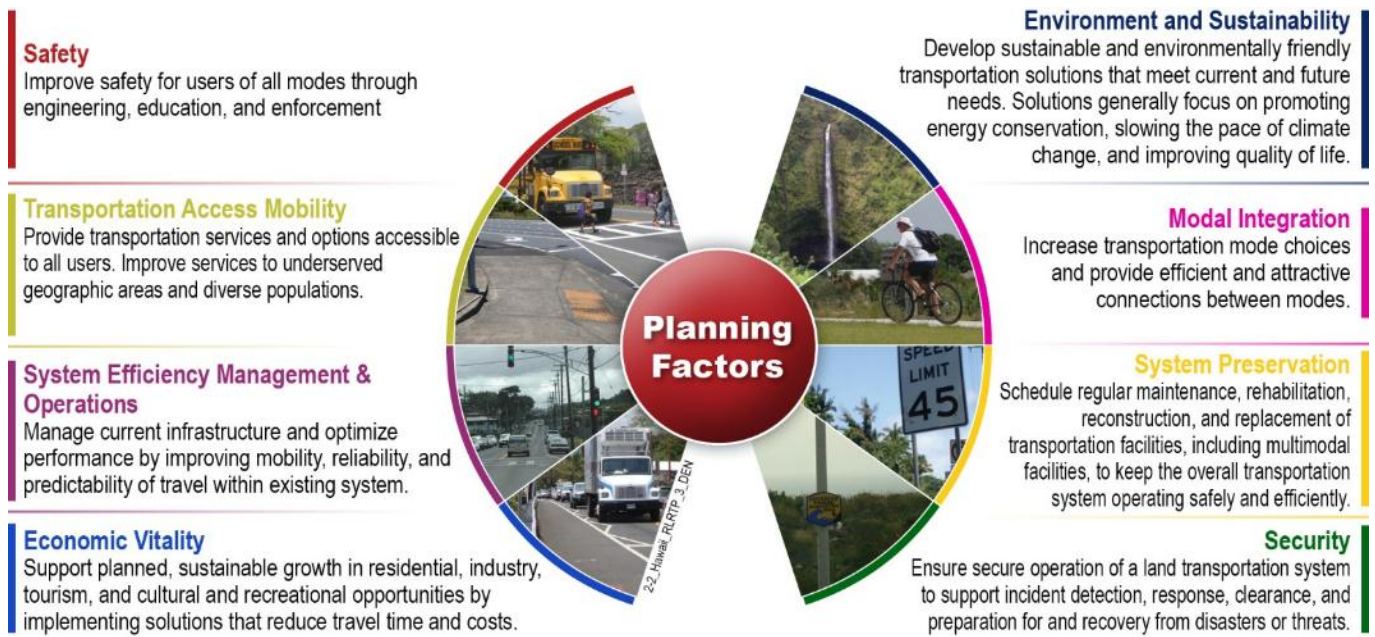
It was critical for the Plan to be specific to the District of Hawaii, as the district's needs and priorities are unique from the rest of the state. The regionally specific goal weighting process and outcomes help tell the story of what is important specifically to Hawaii District, and how best to prioritize potential recommendations to meet these goals. Exhibit 2-3 shows the goals and priorities for Hawaii that will help decision-makers determine programming priorities.

The Hawaii TAC weighted the goals to reflect Hawaii's regional priorities. They assigned weights to the 22 goals on a scale of 100 (the total weightings must add up to 100). The individual input from all participants was averaged.

Stakeholders completed goal weighting before developing recommended solutions to create an objective process. The weights provided insight into the most important values and helped to shape recommended priorities to ensure limited transportation funds are spent on projects that most accurately reflect Hawaii's specific land transportation system goals.



Exhibit 2-2. Planning Factors



As shown on Exhibit 2-3, the more important goals for Hawaii, based on their higher relative weights as assigned by the stakeholders, are:

- Improve capacity and system efficiency by addressing congestion – **Goal 6.1**
- Maintain and improve safety for all modes – **Goal 8.1**
- Expand and increase Hawaii’s economic vitality through the efficient movement of people, goods, and services – **Goal 5.1**
- Preserve and maintain the existing transportation system – **Goal 3.2**
- Provide modal integration (complete streets) and improve transit service – **Goal 2.1**
- Support evacuation and emergency access/egress during incidents – **Goal 4.1**



Exhibit 2-3. Hawaii District Goal Priority Weights

Planning Factor	Plan Goal	Goal Priority Weight
1. Environment and Sustainability	1.1 Preserve and enhance the natural environment, including biological and aesthetic resources.	3%
	1.2 Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.	3%
	1.3 Meet the relevant environmental regulations and standards set by federal, state, and county/city agencies. Maintain collaborative working relationships with agencies and comply with goals of their relevant plans and policies.	1%
	1.4 Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	3%
	1.5 Promote long-term resiliency relative to all hazards mitigation, namely global climate change, with considerations to reducing contributions to climate change from transportation facilities, and reducing the future impacts of climate change on the transportation system.	5%
2. Modal Integration	2.1 Provide a Complete Streets transportation system of motorized and nonmotorized options.	7%
	2.2 Promote efficient travel between modes by creating connections and removing barriers.	4%
	2.3 Promote safe connections between modal alternatives.	3%
3. System Preservation	3.1 Manage transportation assets and optimize investments.	4%
	3.2 Maintain a safe, efficient, complete transportation system for the long term.	7%
4. Security	4.1 Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.	6%
	4.2 Improve resiliency of the state through the transportation system.	3%
5. Economic Vitality	5.1 Promote the expansion and diversification of Hawaii's economy through the efficient and effective use of transportation facilities including movement of people, goods, and services in a safe, energy efficient, and environmentally sound manner.	8%
6. System Efficiency Management and Operations	6.1 Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.	10%
7. Transportation Access Mobility	7.1 Provide appropriate and reliable transportation access options statewide to all users.	4%
	7.2 Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves environmental populations).	4%
8. Safety	8.1 Maintain a safe transportation system for all land transportation modes.	9%
	8.2 Improve safety of the community through connectivity of the transportation infrastructure.	5%
9. Additional Goals	9.1 Obtain sufficient and specific transportation funding.	5%
	9.2 Optimize project delivery.	2%
	9.3 Provide ongoing planning to assess and address statewide needs.	3%
	9.4 Coordinate use of public right-of-way with other public service providers.	1%
		100%





Chapter III

Hawaii District's Transportation Context and Needs

III. Hawaii's Transportation Context and Needs

Hawaii District's land transportation system is critical in supporting the movement of its people and goods throughout the island.

The roadway system is the backbone for moving people and goods around the Island of Hawaii. All modes of land transportation use the roadway system daily, including passenger vehicles, buses, trucks, bicyclists, and pedestrians. The transportation network connects communities and allows people to live, work, and play. It supports the economy and freight transport, sightseeing, and the military. It also supports emergency services and provides a lifeline for residents during natural disasters.

As the island's population grows and its economy evolves, the needs of the transportation system will change. Future development will increase the load on the regions roads. To plan for the future, current conditions must be assessed with the input and involvement of stakeholders. Assessing current and future conditions helps identify needs and deficiencies, and will guide adjustments to the transportation system so it can continue to serve the people on the Island of Hawaii.

This section begins with a description of the work already done in previous plans and policies that lay the foundation of the Plan. Existing socioeconomic characteristics and current land transportation network operating conditions are also summarized.

It then provides a glimpse into the future of transportation on the Island of Hawaii by describing regional forecasted travel demands and system performance. Along with reviews of the existing plans and policies and input from stakeholders, this future condition assessment provides a basis for identifying land transportation needs for Hawaii District.

Plans, Policies, and Programs

Relevant plans, policies, and programs were reviewed to build effectively upon previously adopted work and maintain consistency in needs identification moving

forward. In addition to federal and state plans, the Hawaii County General Plan and Community Development Plans for Kona, North Kohala, South Kohala, and Puna were reviewed. These plans provide policy guidance to address issues related to growth and land use development, while recognizing the assets of the island's towns and communities. Exhibit 3-1 shows the Hilo land use map from the Hawaii County General Plan.



Hawaii Belt Road is used by all modes of land transportation.

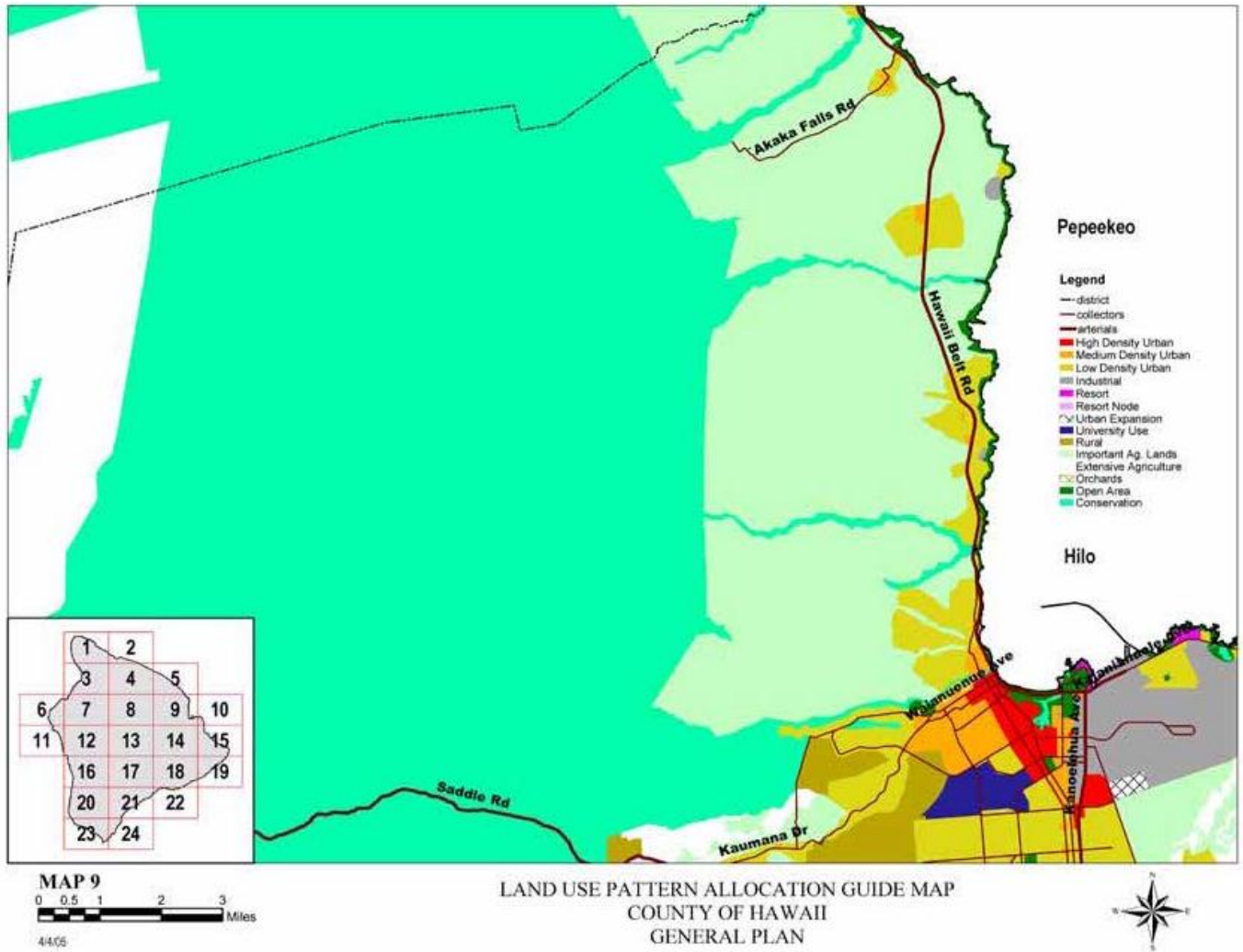
Land use policies are important to transportation planning because the road system and the types of facilities are often driven by the uses. Through planning, the transportation network can be developed to provide adequate mobility while appropriately supporting adjacent land uses. Policies related to land use aim to concentrate future growth in developed urban areas such as Pahoia or Volcano while maintaining more rural characteristics in other areas. Land use considerations in the Hawaii County General Plan were also given to preserve open spaces and encourage efficient, environmentally sustainable land use patterns to combat sprawl developments.

Policies related to transportation include providing appropriate facilities to support developments. Facilities include not just roads and bridges, but also networks of pedestrian and bicycle facilities. As referred to in Chapter 2, see Appendix B for a summary of additional plans, policies, and programs consulted.



Exhibit 3-1. Hilo Land Use Allocation

Source: County of Hawaii General Plan (2005)



Socioeconomic Conditions

Socioeconomic characteristics influence transportation demands and need to be considered in the provision of transportation infrastructure and services. Population, household, and employment information is grouped into geographical traffic analysis zones (TAZs). These zones provide a general picture of where people live and work on the island by geographical area boundary, rather than by street location. Forecasted socioeconomic data are important because they show where growth is programmed to occur, and where the transportation system could experience an increase in demand. For additional information on the socioeconomic conditions, distribution into TAZs, and the travel demand model, see Appendix D.

Population

More than half of Hawaii District's current population resides on the east side of the island in the Hilo and Puna areas. Approximately one-quarter of the population resides on the west side of the island in and around Kona. The Kau and Puna areas, including the towns of Naalehu and Pahoa, have the highest percentage of the population that are considered low-income and living below the poverty line. Up to 40 percent of the population along the southeast coast of the island is categorized as low income. This is an important distinction because this subset of the population typically relies on transit and nonmotorized modes more than other income levels.

By 2035, the overall population on the Island of Hawaii is expected to grow by over 60 percent. The most significant growth is expected in Kohala in the communities of Waikoloa and Waimea, as well as in north Kohala. Puna and south Kona are also expected to see large increases in population.

Households

The existing distribution of households on the island is similar to the population distribution with the majority of households located in the south Hilo or Puna areas. The area along the Hamakua coast and the north Kohala communities currently contain the fewest number of households compared to other populated areas on the island.

Exhibits 3-2a and 3-2b show the concentration of households in 2007 and in 2035 by TAZ. Distribution of households within TAZs is not shown. Areas that become darker in color between the two maps indicate growth in the number of households. By 2035, the number of households island-wide is expected to increase by nearly 70 percent. While households will increase all along the east side of the island, the most significant growth is expected in the Puna and Volcano areas south of Hilo as households more than double. On the west side of the island, the Kohala area and communities in south Kona are also expected to see significant growth in the number of households.

Employment

Hilo is the primary employment center with over 40 percent of jobs located within this area. The majority of jobs on the island are related to the service industry or retail. Military employment on the island (active duty, reservist, and civilian employees) accounts for less than 1 percent of the island's total employment positions.

As the population grows, the number of jobs on the island is also expected to increase. But employment growth will be less geographically dispersed than population or household growth, and anticipated to total around 50 percent island-wide. Most of the future employment opportunities are anticipated in Kona and Hilo. Exhibits 3-3a and 3-3b show the changes in employment between 2007 and 2035.



Exhibit 3-2a. 2007 Household Forecast

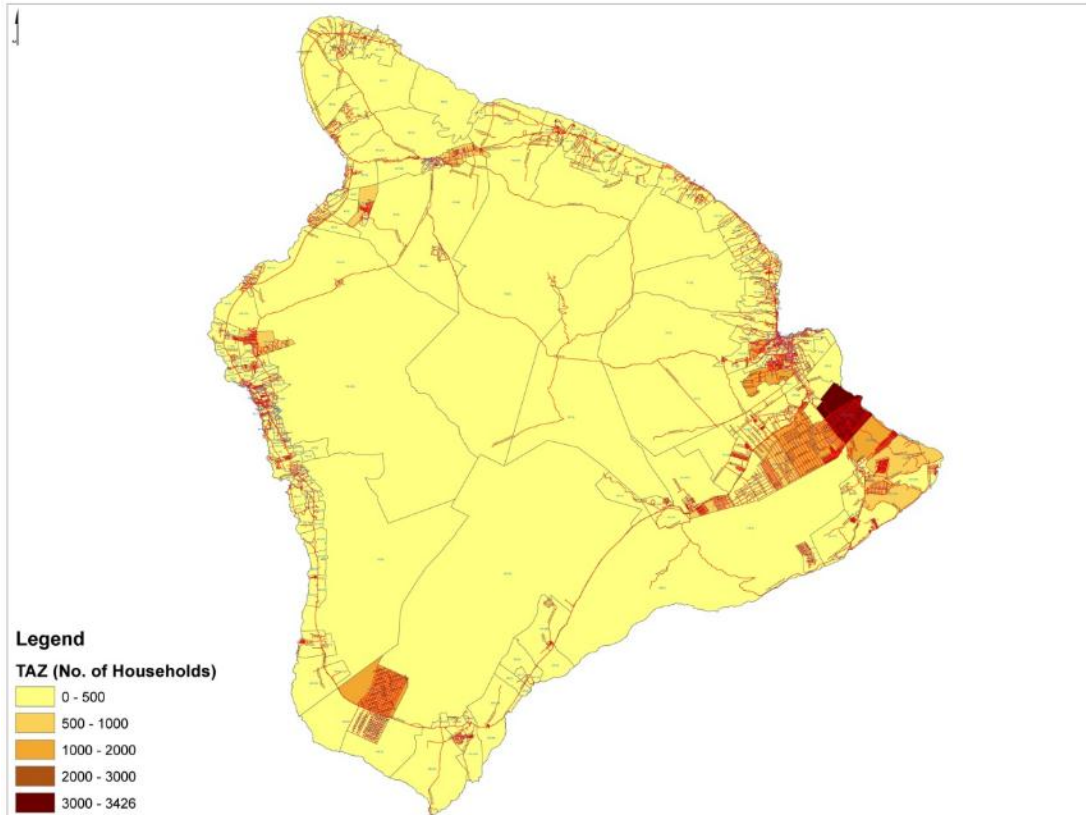


Exhibit 3-2b. 2035 Household Forecast

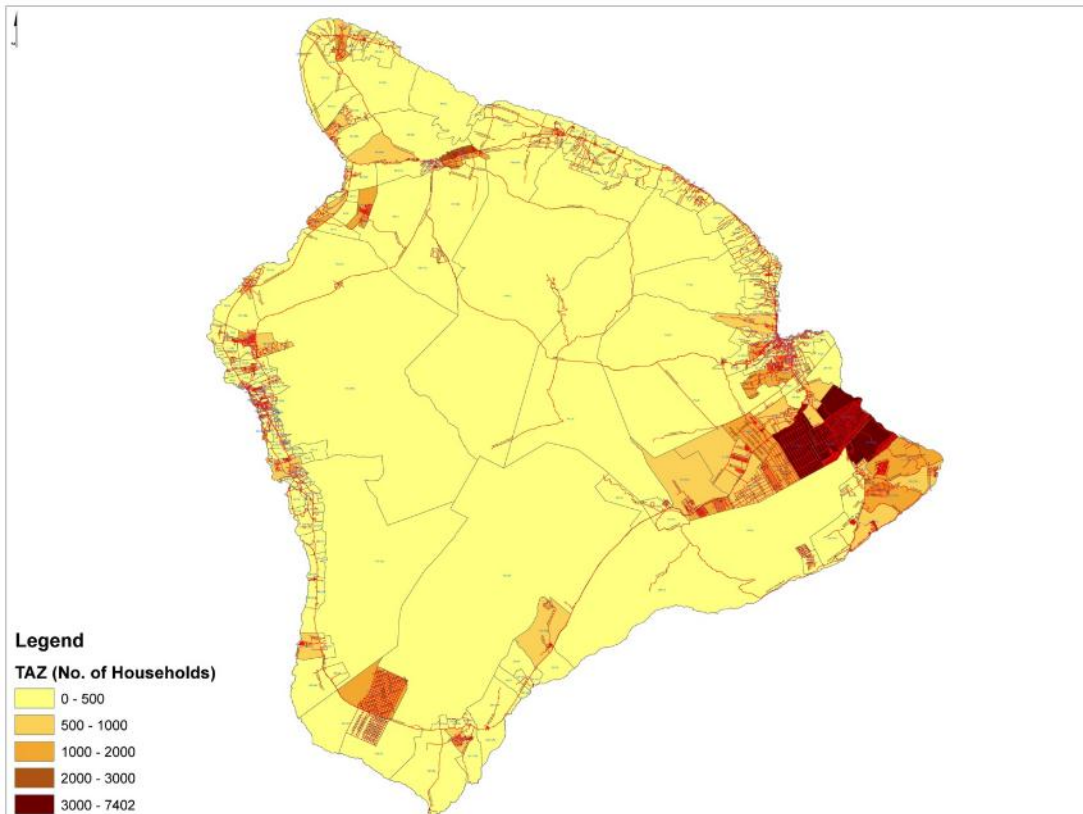


Exhibit 3-3a. 2007 Employment Forecast

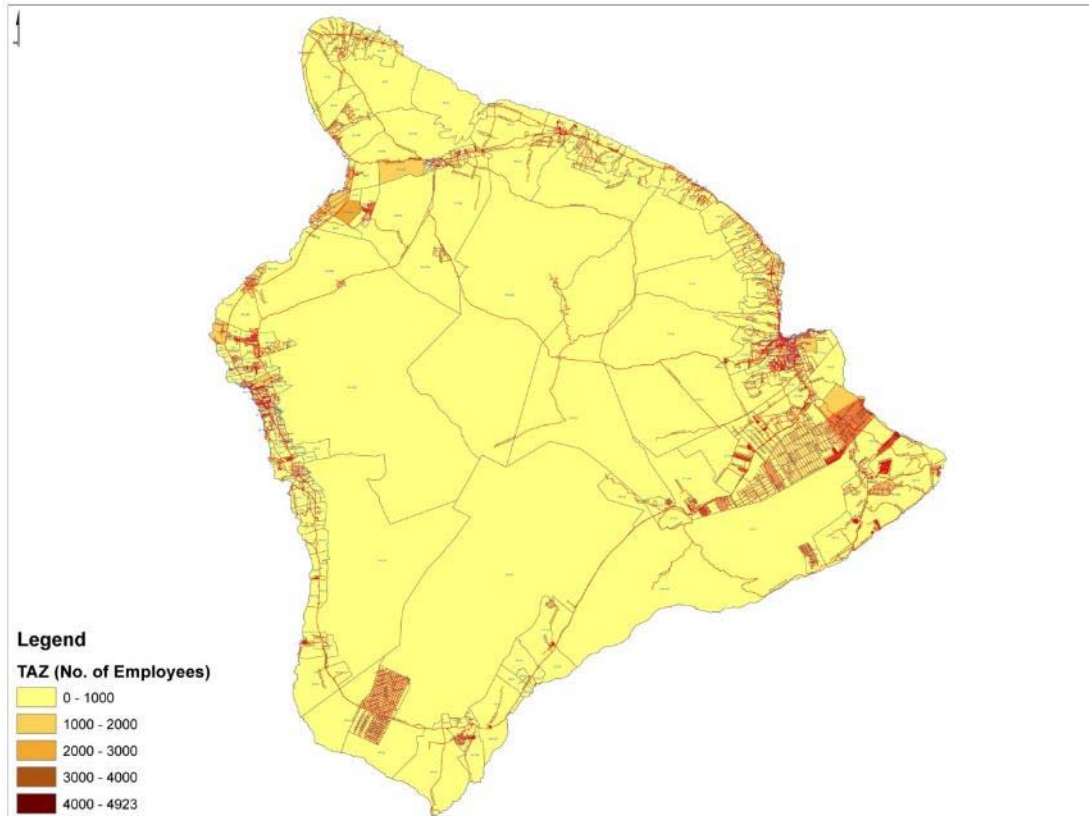
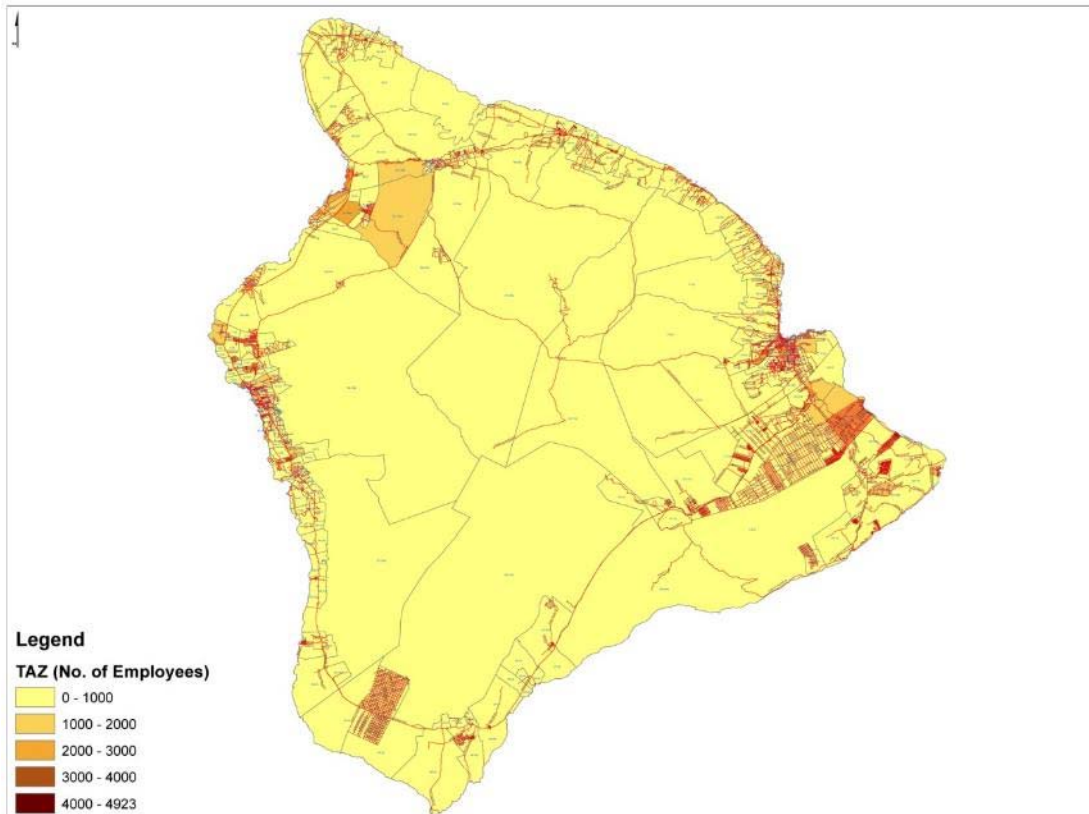


Exhibit 3-3b. 2035 Employment Forecast



Visitor Industry

According to the Hawaii County General Plan, the visitor industry is the island’s leading economic sector, and will continue to be so in the future. In 2007, approximately 28,000 visitors were on the island on an average day. Nearly all visitors to the island arrive at Kona and Hilo International Airports, which served 3.2 and 1.7 million annual passengers, respectively. Hilo Harbor also accommodates nearly half a million cruise ship passengers annually. Visitor accommodations are primarily located in Kona and the Kohala coast/Waimea/Kawaihae area.



Historical Hilo Town appeals to both residents and visitors.

By 2035, air and harbor passenger arrivals to the island could increase by approximately 24 percent compared to today’s visitors. Exhibit 3-4 shows the expected increases in population, households, and employment on the Island of Hawaii by Year 2035.

The growth in annual visitors to the island is also shown. This growth in residents and tourists, and the anticipated increase in accommodations to support them, will result in more vehicles on the island’s roadways as visitors use state highways and arterials to travel between the airports, harbor, and accommodation/tourist areas.

Exhibit 3-4. Forecast Socioeconomic Conditions

Characteristic	2007	2035	Difference	Percent Growth
Population (persons)	173,000	280,100	107,100	62%
Households (units)	62,900	106,300	43,400	69%
Employment (positions)	68,400	102,700	34,300	50%
Annual Visitors (million persons)	1.62	2.01	0.39	24%

Roadway System

Hawaii District’s roadway network connects residents and communities located on the perimeter of the island via a belt road that circles the island and comprises primary and minor arterial segments. This belt road connects to collector roads and minor arterials that provide local access. Due to the island’s geography, there is little access across or through the island.

The Plan encompasses solutions that are on the federal-aid highway network as shown in Chapter 1. Federal-aid roadways include both state and county facilities classified as collectors and arterials.

On the north side of the island, between south Kona and south Hilo, Highway 11 (Hawaii Belt Road) and Highway 19 (Hawaii Belt Road and Queen Kaahumanu Highway) are the main east-west connectors. These primary arterials connect to minor arterials and collector roadways, including Akoni Pule Highway and Kohala Mountain Road, to provide access to more rural areas of the island, such as Hawi on the northern tip of the island.

An alternative, Saddle Road is a rural minor arterial between the island’s two major volcanoes, and provides access between Hilo and the north Kona/Waimea area. This road is the sole alternative to the belt road system. Because there is little access through the island, vehicle trips on the island between major centers such as Hilo and Kona tend to be long (greater than 2 hours on average).





Akoni Pule Highway is a minor arterial.

On the south side of the island between Kona and Hilo, Highway 11 (Hawaii Belt Road) is the sole access to rural communities such as Pahala, Naalehu, and Ocean View.

Within Kona, Highways 19 (Queen Kaahumanu Highway), 180 (Mamalaho Highway), and 190 (Hawaii Belt Road) are the principal and main arterials and provide local circulation to businesses, retail, and the airport. Similarly, within Hilo, Highways 19 (Mamalaho Highway), and 11 (Hawaii Belt Road) provide access.

Travel Demand

With the projected growth in population and employment, and the anticipated increase in land development, the demand for space on roadways will increase in the future.

The federal-aid highway system supports all modes of travel, so the impact of higher demand is likely to affect motorized modes such as general traffic, freight vehicles, and transit as well as nonmotorized modes such as bicyclists and pedestrians.

Existing and future travel demand and the changing conditions of each travel mode are discussed in this section. Competing needs of the various travel modes are also identified as they share the same roadway.

Vehicular Volumes

Traffic operations can be described by volume-to-capacity (V/C) ratios and level of service (LOS). The V/C measurement quantifies the relative vehicle demand versus the capacity of a facility. The capacity of a facility depends on a variety of factors including the number of lanes, the operating speed, and the number of driveways or intersections on a roadway. A V/C ratio of 1.0 indicates that vehicle demand is equal to the capacity of the facility, and generally correlates to LOS F.

The LOS generally describes operating conditions in 6 letter-grade categories. LOS A typically represents conditions with little or no delay, while LOS F indicates poor operations with long wait times or extreme congestion.

Currently, the average daily traffic volumes around the island are highest in and around Hilo. As one of the central hubs of the island, vehicles travel to and from this location for work and play. Keaau-Paho Road (Highway 130) southeast of Hilo carries over 40,000 vehicles per day (in both directions), while the Hawaii Belt Road south of Hilo approaching Keaau carries around 50,000 vehicles per day. Traffic volumes decrease as the highway moves further away from Hilo. Both of these segments have a V/C of 1.0 or greater and operate at LOS F.



Mamalaho Highway is part of the Hawaii Belt Road.



South of Kona, average daily traffic on Hawaii Belt Road (Highway 11) is around 27,000 vehicles per day. North of Kona, towards the Kona International Airport, traffic volumes on Queen Kaahumanu Highway (Highway 19) are around 21,000 per day. Due to the high volumes, traffic signals, and turning movements to and from the roadway, Hawaii Belt Road through most of Kona has a V/C of 1.0 or greater and operates at LOS F. Traffic volumes on Queen Kaahumanu Highway (Highway 19) increase to around 23,000 per day near the Kohala Coast resorts, and then begin to reduce in the vicinity of Waimea and Honokaa.

In the future, traffic is expected to increase due to larger population, more jobs, and new land developments on the island. Volumes on Keaau-Pahoa Road (Highway 130) near Hilo are forecast to double by Year 2035, and volumes on Hawaii Belt Road west of Hilo would likely see modest increases in 2035 due to the availability of parallel facilities. The already congested roads near Kona would also see increases, resulting in worse operating conditions compared to today. Travel times between communities would increase, and vehicles on those highways could experience long delays and slow travel times. Because these facilities would not be able to handle the forecasted traffic, they are identified as a transportation deficiency. Exhibits 3-5 and 3-6 illustrate the V/C ratios.

A	Free flow operation, vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.
B	Reasonably free flow, vehicles ability to maneuver within the traffic stream is only slightly restricted.
C	Freedom to maneuver within the traffic stream is noticeably restricted.
D	Freedom to maneuver within the traffic stream is more noticeably limited and the driver experiences reduced physical and psychological comfort level.
E	Vehicles are closely spaced, leaving little room to maneuver within the traffic stream.
F	Breakdowns in vehicular flow.

3-12_Hawaii_RLTP_2_DEN



Exhibit 3-5. 2007 Volume-to-Capacity Ratio

Source: CH2M HILL (2012a)



Exhibit 3-6. 2035 Volume-to-Capacity Ratio (No Build)

Source: CH2M HILL (2012a)



Freight System

Freight mobility is critical to the economic vitality of the island. Although there are no specified freight routes on the Island of Hawaii, freight activities are concentrated around the commercial harbors and airports and cargo vehicles use the same arterial roadways as general traffic to transport goods to market throughout the island. Freight cargo is accommodated at both Hilo and Kona International Airports and two commercial harbors; Hilo Harbor on Kuhio Bay in Hilo, and Kawaihae Harbor on the northern end of the Kohala Coast.

Currently, Hilo Harbor handles 1.7 million tons, or approximately 144,800 twenty-foot equivalent units (TEUs), of cargo. Kawaihae Harbor handles 1.0 million tons, or roughly 85,800 TEUs of cargo. Kona and Hilo International Airports accommodate 22,300 tons and 24,100 tons respectively.



Freight vehicles use the same roadways as all other modes of land transportation.

Freight vehicles use arterial and local roadways to distribute goods to communities around the island, potentially adding to congestion due to the lack of parallel or alternative routes along much of the island. As the economy grows, cargo into and out of the island is expected to increase. In the future, freight is expected to increase by 47 percent. The airports are anticipated to handle nearly 70,000 tons of cargo, while the commercial harbors would process over 4 million tons (or approximately 339,600 TEUs) of cargo by 2035.

Compared to current conditions, a significant number of additional freight vehicles would be on the roadway system to deliver goods in the future. This increase in freight operations would likely worsen congestion on highways near the airports and harbors, and traffic operations need to be improved in order to avoid costly delays and adverse impacts to the economy.

Exhibits 3-7 and 3-8 show the current and anticipated distribution of freight vehicles on the island's highways.



Exhibit 3-7. 2007 Freight Distribution
 Source: CH2M HILL (2012b)

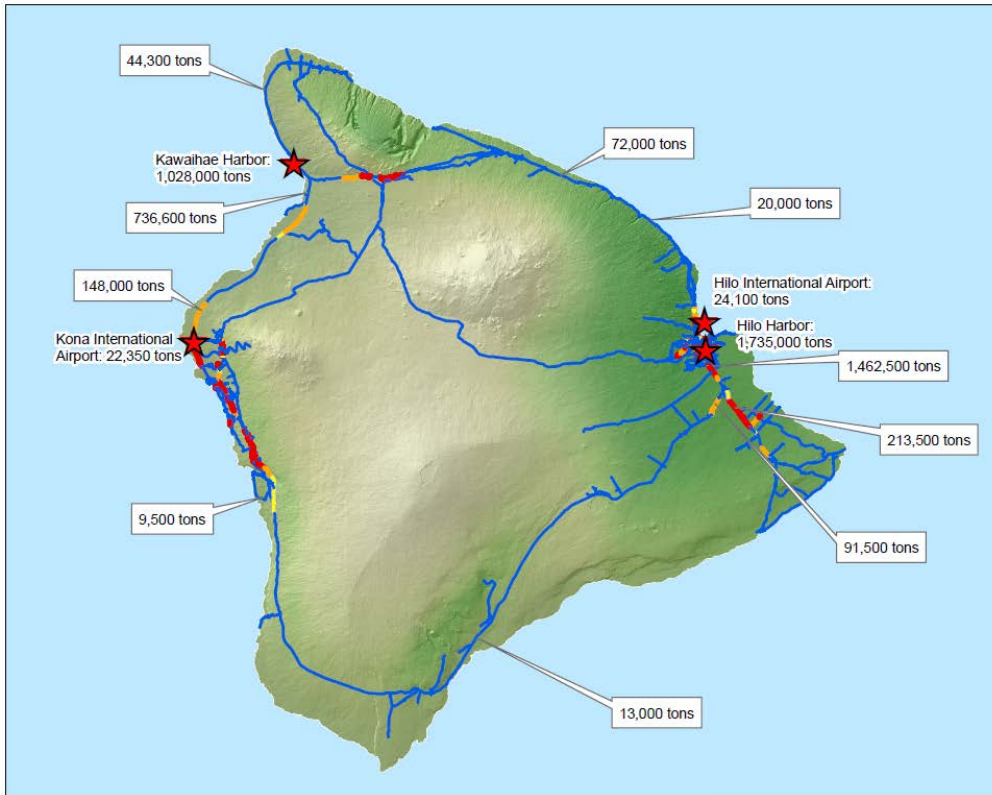
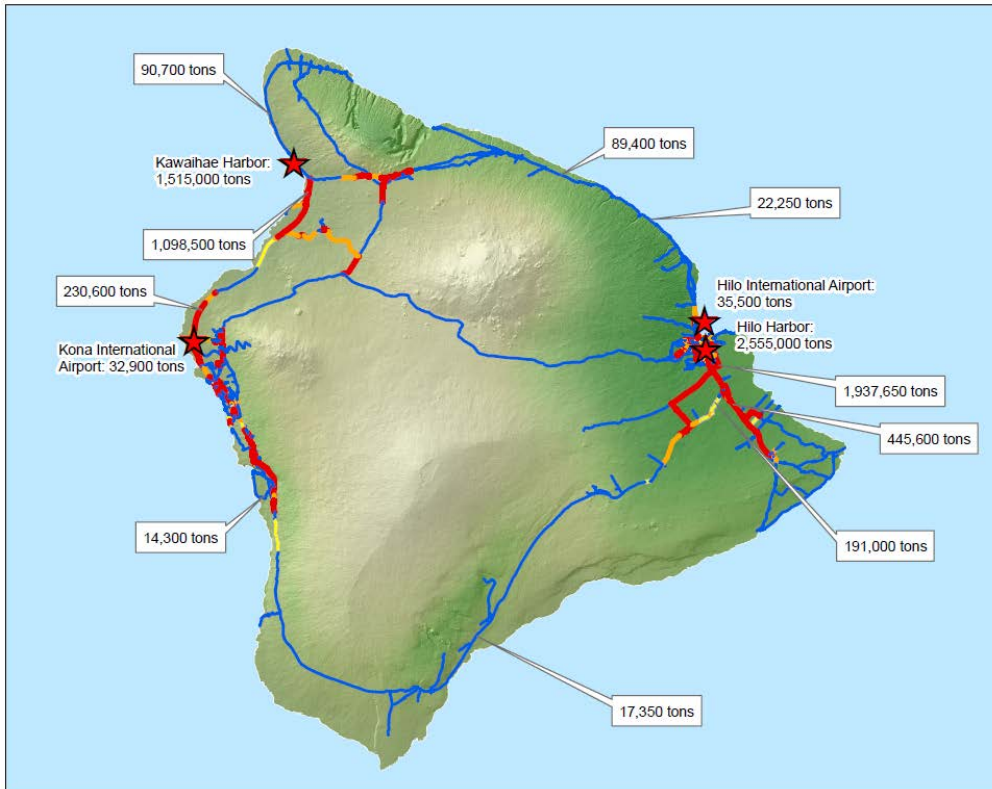


Exhibit 3-8. 2035 Freight Distribution
 Source: CH2M HILL (2012b)



Public Transit System

Public transit provides an option and opportunity for personal mobility for anyone, regardless of age, income, social or physical status. Additionally, public transit benefits overall quality of life through reduced traffic congestion and improved air quality. It also provides a modal alternative for those who are unable to, or choose not to drive.

The Hawaii County Mass Transit Agency currently provides public transportation via ten different general service routes to all areas along the Hawaii Belt Road highway system via the Hele-On Bus. Transit service is also provided along the Kohala coast on Queen Kaahumanu Highway, up to Hawi on Akoni Pule Highway, and south to Kalapana on Keaau-Pahoa Road. Currently, service is not provided on the Saddle Road, but transit users can travel between the Kohala resorts and Hilo via a transit route through Waimea.

Commuter service is also provided once in the morning and once in the evening in the peak commute direction for the major job areas of Hilo, Kona, and the Kohala coast.

In addition to scheduled service, the transit agency offers paratransit service and a shared ride taxi program which provides door to door transportation service within 9 miles of the urbanized areas of Hilo and Kona. Exhibit 3-9 shows the existing service route areas.

Existing public transit infrastructure includes bus stops and park-and-ride facilities. Transit will become increasingly important to travelers in the future. Ridership is expected to increase, as will the number of buses necessary to carry passengers. In addition to the number of buses, the size of transit vehicles is also likely to increase.

Regional transit service relies on the highway system to operate and maintain schedules. Because buses, passenger vehicles, and freight all must share the same road, congestion or delay on the highways would have a negative impact on transit service in terms of reliability. Transit operations will have to be coordinated with planned infrastructure and improvements to optimize future shared roadway performance. Improved traffic operations on these shared roadways is necessary in order to provide efficient transit service if future anticipated demand is to be accommodated.



Hilo transit users wait at the bus stop.



Bikeway System

Bicycles are increasingly being recognized not only as a recreational activity, but as a viable transportation mode. Bike Plan Hawaii summarizes the multifaceted benefits of bicycling, not only as a means of transportation, but also related to health, economics, community, and the environment.

Hawaii District has nearly 27 miles of designated bicycle facilities, which are made up of three types: paths, bike lanes, and signed shared roadways. These facilities are illustrated on Exhibit 3-10.



A roadway sign informs motorists of the designated bike lane.

The American Association of State Highway and Transportation Officials (1999) define these facilities as:

- **Paths or Shared-use Paths** – a bikeway that is physically separated from motorized vehicular traffic by an open space or barrier. Shared-use paths may also be used by pedestrians and other nonmotorized users.
- **Bike Lanes** – a portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.
- **Signed Shared Roadways** – a shared roadway that has been designated by signing as a preferred route for bicycle use. This may be an existing roadway with wide curb lanes, or paved shoulders.

Bike Plan Hawaii provides an inventory of the existing bicycle system on Hawaii. Exhibit 3-11 shares the benefits of biking from Bike Plan Hawaii and Exhibit 3-12 shows these facilities.

Future needs for bicycle facilities have also been identified in Bike Plan Hawaii. To accommodate bicyclists, paths and shared facilities are proposed on most of the major highways and arterials throughout the island. These shared roadways are intended to accommodate both bicycles and motorized vehicles on the same road.

Exhibit 3-10. Bike Facility Types

Source: *Bike Plan Hawaii, Hawaii Department of Transportation (2003)*



Exhibit 3-11. Benefits of Biking

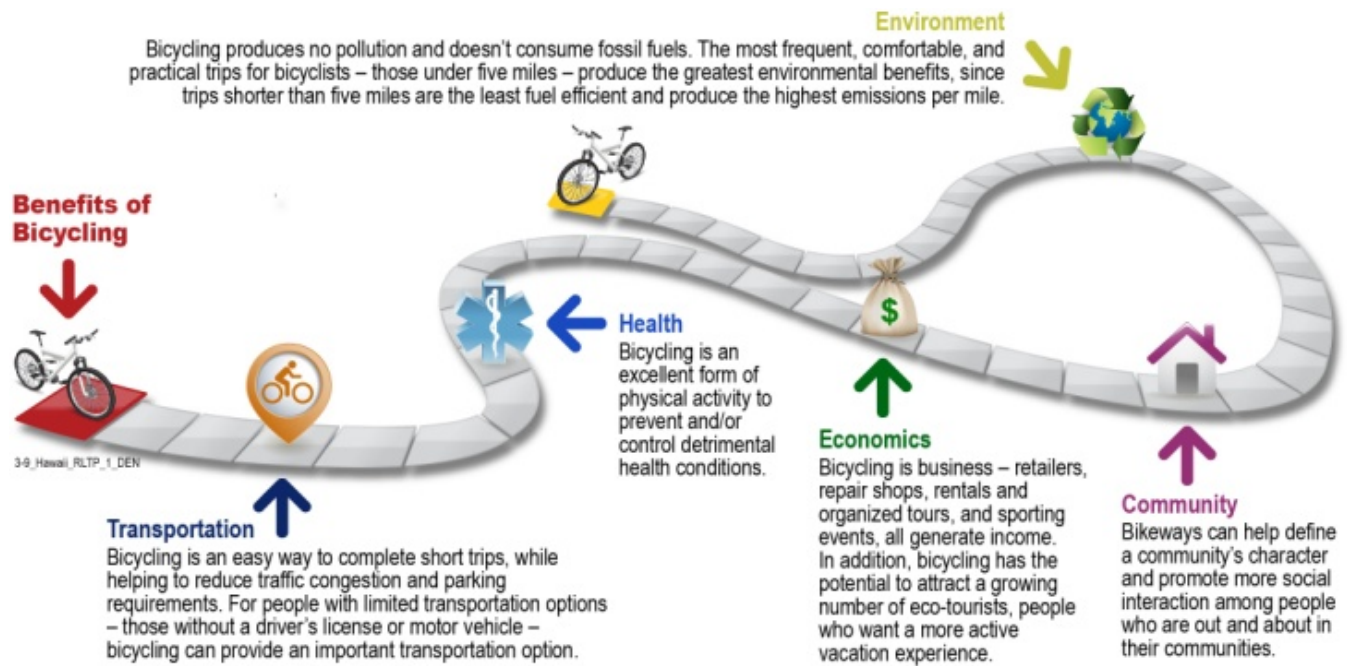
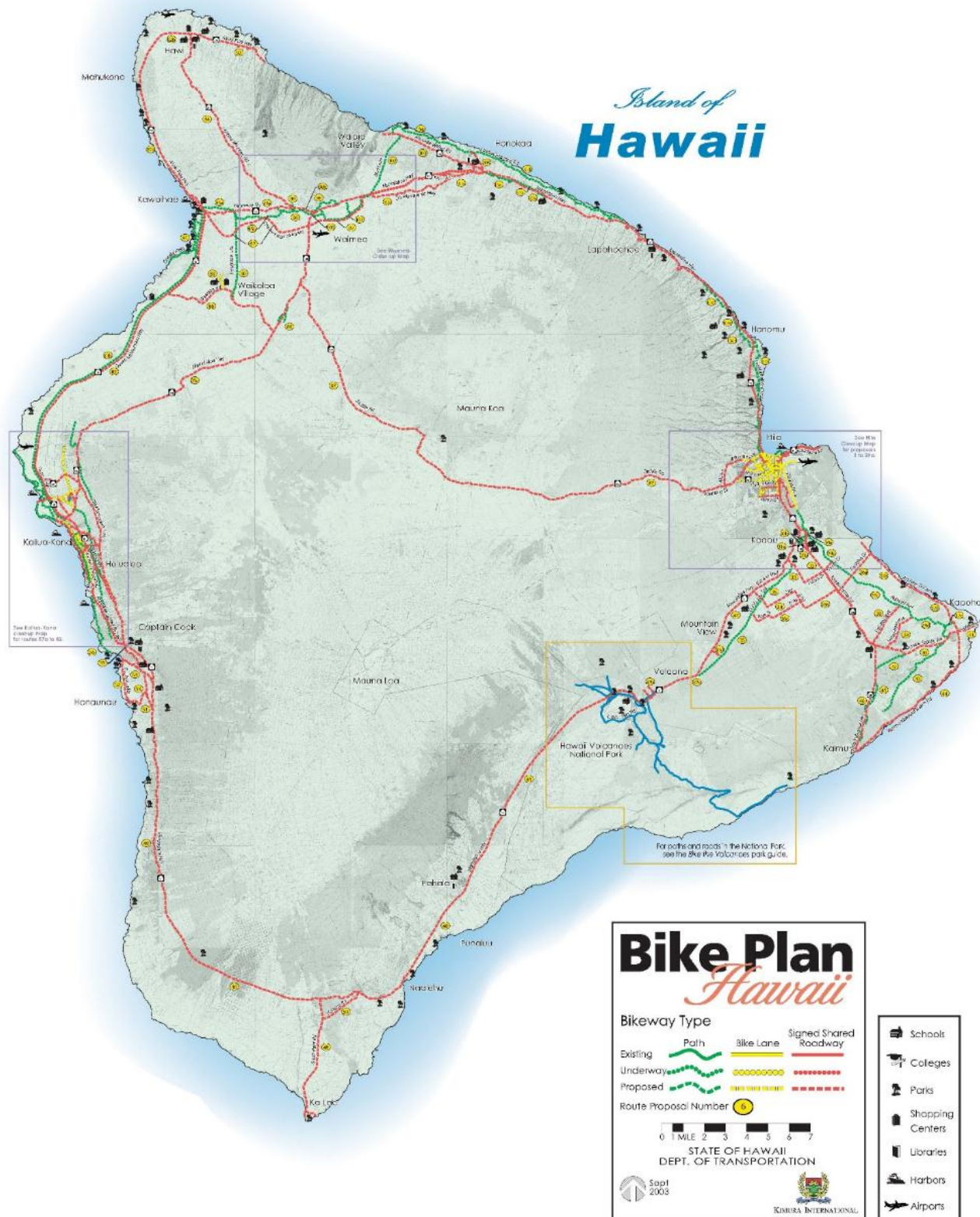


Exhibit 3-12. Existing and Planned Bicycle System
 Source: *Bike Plan Hawaii, Hawaii Department of Transportation (2003)*



Pedestrian System

Pedestrian facilities are a critical part of the transportation system. For every trip that is made, a portion occurs as pedestrian travel. The benefits of walking are similar to those noted for bicycling; transportation, health, economics, community, and the environment.

Pedestrian facilities can generally be described as any infrastructure that is designed specifically for use by a pedestrian. These include sidewalks, crosswalks, and paths.

The Statewide Pedestrian Master Plan provides information on the existing pedestrian system, shown on Exhibit 3-13, and identifies future areas of concern. There are very few sidewalks on the federal-aid highways in the Hawaii District, because they pass through predominantly rural areas. Within Hilo and Kailua-Kona, there are sidewalks along sections of one side of the state highways. Gaps in sidewalks, narrow shoulders, and lack of crosswalks on roadways meant to be shared with pedestrians are a few examples of needs/deficiencies identified.



Highly visible crosswalks provide pedestrians safe access to the Hilo Farmers Market.

VISION



Hawaii's integrated and multi-modal transportation system provides a safe and well-connected pedestrian network that encourages walking among all ages and abilities. The system promotes a positive pedestrian experience; promotes environmental, economic and social sustainability; fosters healthy lifestyles; and conserves energy.

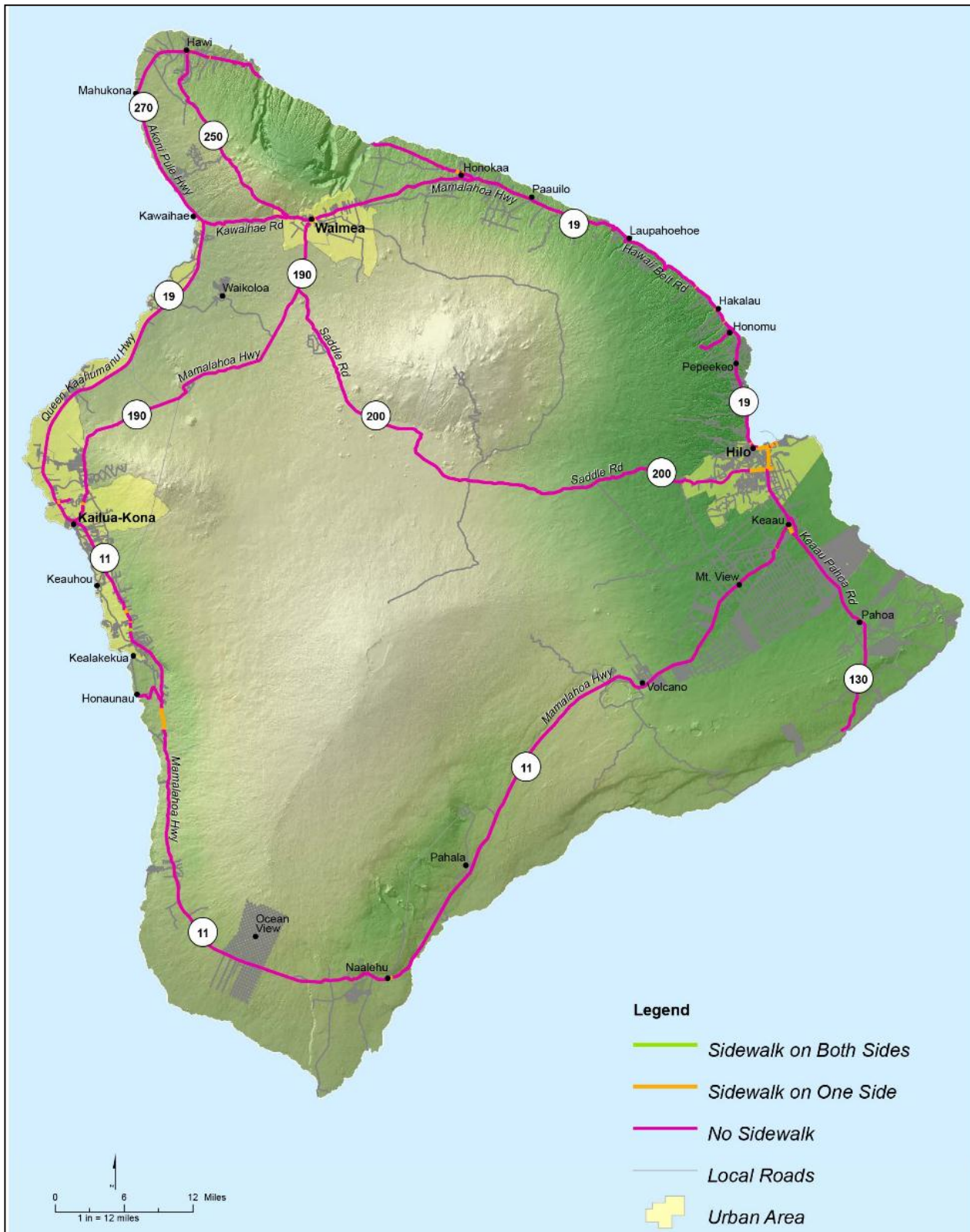
More people in Hawaii choose to walk for both transportation and recreation as a result of enhanced walking environments, mobility, accessibility, safety, and connectivity throughout the transportation system.

Source: Statewide Pedestrian Master Plan



Exhibit 3-13. Existing State Pedestrian System

Source: *Statewide Pedestrian Master Plan, Hawaii Department of Transportation (2013)*



Emergency Response System

The land transportation system is very important for emergency operations during any type of disaster, and for providing relief, response, and recovery. Weaknesses in the land transportation system could be a great impediment to dealing with the impacts of a major hazard.

The purpose of the Hawaii County Multi-Hazard Mitigation Plan is to protect people and property from destruction caused by natural hazards. It focuses on assessing risk of these potential natural hazards, identifying potential strategies to address them, and coordinating technical and financial resources to help respond to them.

Major goals of the mitigation plan include ensuring that critical emergency response facilities are functional and operational during events and lifeline infrastructure is able to withstand events. The plan also considers managing future development and retrofitting or reinforcing existing structures to minimize loss.

Due to its unique geography, many of the communities located around the island have limited roadway choices for evacuation or emergency response. For the majority of residents, the Hawaii Belt Road is the sole option for reaching other parts of the island. For people residing in more isolated communities such as Hawi on the north or Kalapana on the east coast, access to the belt road is extremely crucial.



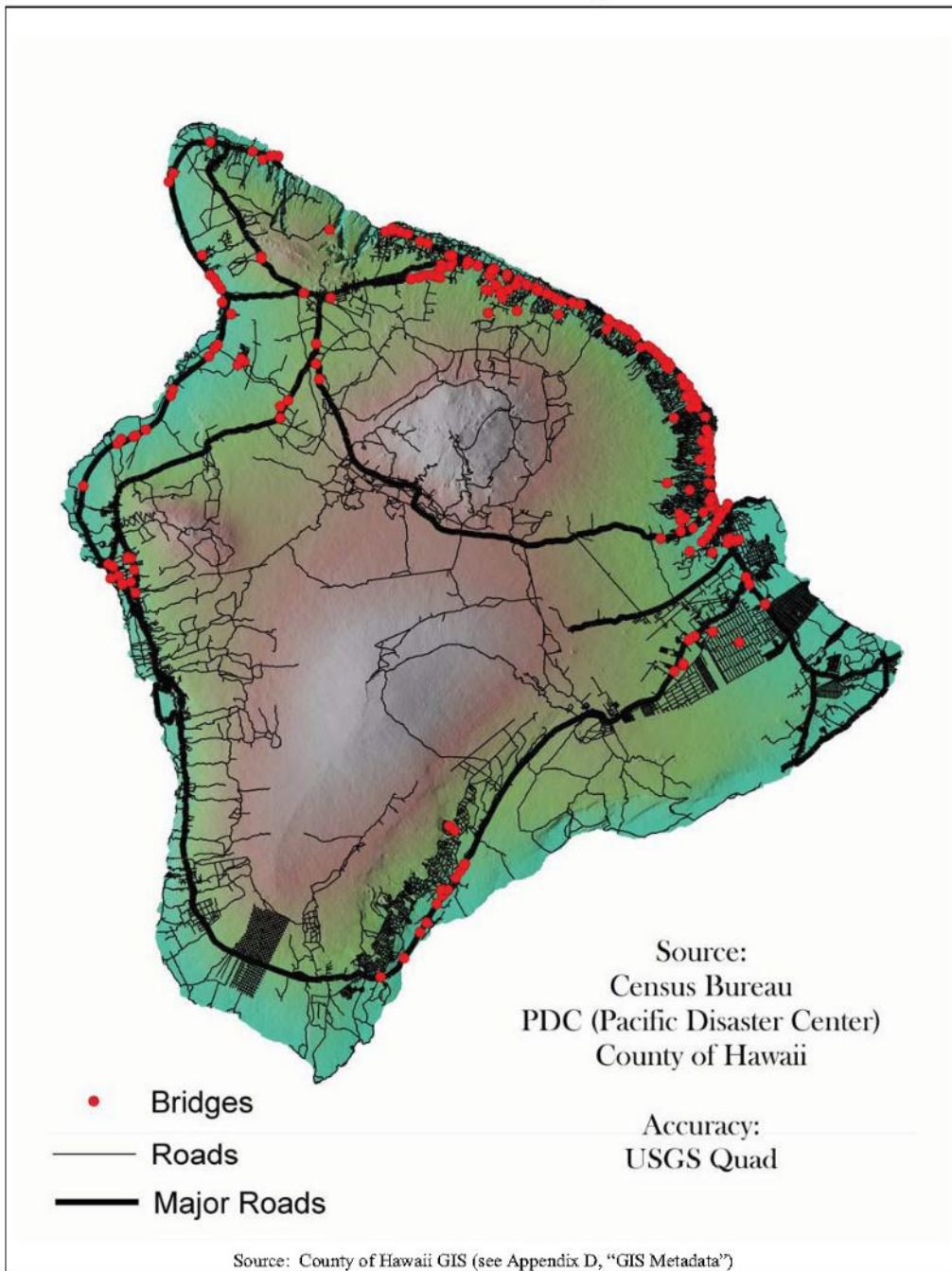
Ninole Bridge, Naalehu, is a crucial link along Mamalaloha Highway, which is the only road around the southeastern side of the island.

When these highways are congested, emergency response times would be affected and residents could be impacted. Exhibit 3-14 reflects the numerous critical emergency facilities on the island.

Future highway operations need to be improved in order to provide viable access routes during emergencies and hazard events. The condition of the roadways and bridges also need to be preserved and maintained in order to support efficient recovery or evacuation.



Exhibit 3-14. Critical Emergency Facilities
Source: *Hawaii County Multi-Hazard Mitigation Plan (2007)*



Land Transportation Needs

Needs and deficiencies of Hawaii District's land transportation system were identified through various methods. As previously mentioned, relevant plans and policies were reviewed and future forecast demand was assessed against the transportation infrastructure.

An equally important contributor to the identification of transportation needs and deficiencies were the discussions with stakeholder groups. Stakeholder groups identified regional system needs that aligned with the eight planning factors and the final goals and objectives of the Plan. This approach was used to identify the root of the issues, and allowed for deficiencies to be addressed in multiple ways. A summary of the public involvement process is included in Appendix E.

Stakeholder Input

Stakeholder groups represented various cross-sections of the community. Agency and user perspectives of comprehensive land transportation needs were captured through facilitated discussions.



Stakeholders discussed the needs for Hawaii District's land transportation system.

During these discussions, stakeholders were given maps of the island's transportation network. These maps included the existing roadway network, as well as potential locations of solutions that were previously identified through relevant plans and policies. Potential solutions were shown to focus the workshop

on new locations and areas of concern to develop a comprehensive list of needs and deficiencies.

The stakeholders were asked to identify needs as they related to the specific group they represented, and as they related to the planning factors. Workshop participants worked together to mark up the transportation network maps with their ideas and concerns, using different colors to differentiate between needs for each of the various planning factors.

Stakeholders were also encouraged to share background knowledge and describe experiences at these locations to help support and explain the system need.

Stakeholders and the planning team also examined the existing and future roadway conditions maps (Exhibits 3-5 and 3-6) to identify specific needs related to roadway capacity. Where the anticipated volume of trips met or exceeded a particular roadway's capacity (V/C of 1.0 or greater), a capacity deficiency was identified. Congestion and connectivity or access needs were also identified using the roadway V/C conditions maps.

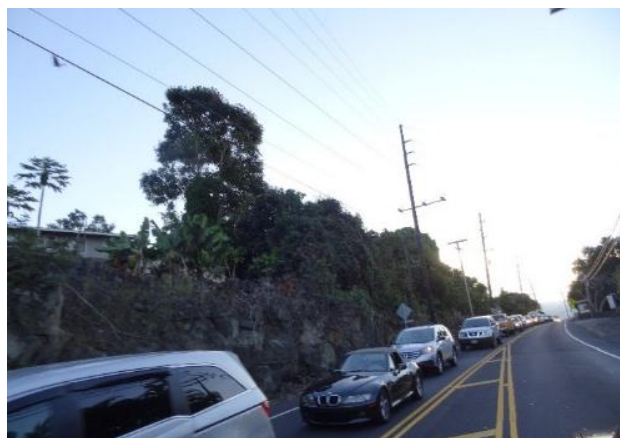
Alignment with Goals and Objectives

Identified needs and deficiencies were evaluated with respect to the overall planning factors and the goals and objectives specific to this Plan. This ensured that the recommendations from the Plan would be consistent with statewide and federal planning regulations and the stakeholder visions and values for Hawaii District and could guide the development of effective potential solutions. These solutions will then address specific identified issues and fulfill the purpose of the Plan. Identifying needs in terms of the goals and objectives ensures that the transportation system is reviewed comprehensively.

Recurring discussions related to its transportation system needs and deficiencies are listed below along with their alignment to specific planning factors:



Addressing capacity and congestion – In certain areas of the island, the belt highway bisects communities and becomes congested with local traffic and vehicles just passing through. This congestion affects residents and visitors alike, and impacts cars, freight vehicles, and transit because they share the same roadway. Developing solutions such as additional lanes to existing travelways and alternate circulation options could address Hawaii District’s congestion deficiencies. These capacity and congestion needs align with the Environment and Sustainability, System Preservation, Economic Vitality, and System Efficiency Management and Operations planning factors.



Motorists queue along Mamalahoa Highway.

Providing emergency access/egress to communities – Many communities are located on the island’s perimeter and solely connected by the belt highway. Other communities are further isolated by single access roads that extend from the belt highway. Emergency access would be impacted if these roadways or any bridges along it are affected by erosion, rockfalls, flooding, or slides. Constructing secondary access roads or by-pass roads that provide alternate paths for rescue and recovery during emergencies would improve the safety and security of these communities. Solutions that help maintain operations during emergencies and natural events align with the System Preservation, Security, and Safety planning factors.



A guardrail is in need of repair.

Improving highway safety – A recurring need identified by stakeholders is safer roadways. Hawaii Belt Road is the primary highway connection for people and goods around the island, and many more arterials provide regional access. To improve safety, the island’s roads could benefit from improvements such as wider shoulders, more locations with guardrail, increased hillside, or slope protection, and increased visibility. Improving roadway facilities for users aligns with the Environment and Sustainability, Efficiency Management and Operations, and Safety planning factors.



Bike lanes provide bicyclists a safe, separated path from pedestrians and motorists.



Providing facilities for nonmotorized modes –

Stakeholders have expressed a strong need for more pedestrian and bicycle facilities island-wide. Bicycle lanes, shared-use paths, complete sidewalks, and trails would increase the nonmotorized network. Providing new facilities, improving existing facilities, and increasing visibility for users align with the Environment and Sustainability, Modal Integration, and Safety planning factors.

Improving transit service – Increasing transit service and improving facilities on which transit travels has been identified as a future need. Modifying existing routes to improve reliability, as well as increasing or expanding service areas, could address anticipated future transit needs. Making transit accessible to all populations aligns with the Modal Integration and Transportation Access Mobility planning factors.



The Hele-On bus provides residents a transit option for transportation.





Chapter IV

Potential Solutions

IV. Potential Solutions

Stakeholders and the planning team developed potential solutions to address the recognized needs and issues for the District of Hawaii. The planning team then evaluated the potential solutions against the Plan goals and objectives to prioritize program recommendations.

Solution Development

After understanding the transportation issues and needs unique to Hawaii District, the planning team developed potential solutions using a similar method to how they identified needs. The planning team drew on a number of sources to develop the list of potential solutions:

- Plan, policy, and programs review provided potential solutions to address previously identified deficiencies.
- Travel demand model forecasts for the future baseline years of 2020 and 2035 identified capacity or congestion issues to help guide potential solutions.
- Stakeholders provided input on capacity deficiencies to identify areas to develop congestion-focused solutions.

Stakeholders provided input, reflecting the knowledge of the groups represented, on solutions for non-capacity related needs and issues.



Stakeholders were engaged throughout the plan development process.

To generate a diverse range of potential solutions, stakeholders were asked to work in small groups and mark up roadway maps with their ideas. The interactive format encouraged stakeholders to weigh the benefits of particular solutions against impacts on their island environment. These inputs enabled the planning team to develop a broad range of potential solutions that would potentially address identified needs.



Stakeholders provided comments by marking up maps.



Potential solutions were identified for the list of needs.



Solution Evaluation Process

A two-tier process was used to ensure that potential solutions are appropriate for the Plan and to narrow the list of solutions to a set of manageable options.

Tier 1

In Tier 1, each potential solution was evaluated against a set of six high-level criteria shown on Exhibit 4-1. These criteria were intended to eliminate potential solutions that were inconsistent with the fundamental goals and objectives of the Plan, conflicted with the overarching the HDOT Highways District mission statement, or were outside the scope and jurisdiction of the Plan.

As a potential solution was assessed for each of the six Tier 1 criteria, it was determined to “pass” or “fail.” Any solution that failed at least one criterion did not advance to the Tier 2 evaluation process, and was removed from further recommendation.

Tier 2

During the Tier 2 evaluation process, the planning team developed specific evaluation criteria for each Plan

goal. The criteria were based on documented data sources, and were specifically crafted to assess a potential solution’s effectiveness in meeting the Plan’s defined goals.

For example, Chapter 2 revealed that Goal 6.1 (to improve capacity and overall system efficiency by reducing congestion within the existing system) is relatively important to the District of Hawaii. To evaluate potential solutions against this goal, specific criteria related to maintaining efficiency were developed. Potential solutions were graded on how well they support or encourage traffic operations to be consistent with the designated functional classification. Solutions that were aligned with maintaining appropriate levels of traffic, through access management or efficient design would meet multiple criteria. Meeting these criteria would indicate that the potential solution supports the goal of improved system efficiency and reduced congestion.

Exhibit 4-1. Tier 1 Evaluation Criteria



4-1_Hawaii_RLTP_1_DEN



Goal 8.1 (to maintain a safe transportation system for all modes) is also important to the District of Hawaii. To measure potential solutions against this goal, evaluation criteria were developed based on the Complete Streets principle of providing transportation facilities that reduce risk and support safe movement of people and goods by all modes, and on the Hawaii Strategic Highway Safety Plan’s recommended strategies. These strategic actions were directly translated into criteria, which included increased visibility, separated directional traffic, minimized or reduced potential vehicle conflicts on roadways, and removal of fixed objects and steep grades from roadsides. Potential solutions that met one or more of these criteria were aligned with the Plan goal of safety for all land transportation modes.

The potential solutions were evaluated for each of the criteria and assigned a grade between -2 and +2. Detailed descriptions of the Tier 2 evaluation criteria and grade definitions may be found in Appendix F.

The grades assigned in Tier 2 evaluation measured how well a solution meets or addresses a specific Plan goal. The grades also showed the advantages and disadvantages of one solution relative to another. For stakeholders, the grades provided a means of seeing tradeoffs among solutions, thereby making the comparative function of the grades more important than the actual grades per se.

The Tier 2 evaluation criteria grades were as follows:

- **1, 2:** The potential solution supports realization of the Plan goal
- **0:** The potential solution is not directly related or does not impact the Plan goal
- **-2, -1:** The potential solution is contrary to the Plan goal

After the planning team assigned Tier 2 evaluation grades for each goal, the team multiplied the grades by two weights: (1) the regional goal priority weight (described in Chapter 2), and (2) the relevant planning factor weight developed by the HDOT program managers. The planning factor weights reflected state priorities based on staff’s understanding of particular HDOT program needs and the ability to fund that

program based on historical expenditures. Appendix F explains the planning factor weights.

Each of the potential solutions received a series of



ratings corresponding to the individual goals of the Plan. Exhibit 4-2 shows an example of the Tier 2 evaluation worksheet.

When summed, the goal ratings produced a composite solution rating, which indicated how well the particular solution would meet the goals of the Plan. The planning team then compared the solution ratings across the pool of potential solutions.

Solution Prioritization

The planning process for the Plan requires solutions be prioritized using a logical process for two reasons:

- (1) Ensure that the priorities reflect a combination of community, local agency, state agency, and other stakeholder input.
- (2) Help allocate limited transportation funds to the high-priority solutions, providing implementing agencies with a “road map” of which projects or programs to implement first.



Exhibit 4-2. Tier 2 Evaluation Worksheet

Project Number:	Total Solution Rating:	0.000			
Project Name:	Cost Estimate:	\$0.000			
Project Location:					
Project Type:					
Project Description:					
Goal Rating is calculated by the formula: (Goal Priority Weight X Planning Factor Weight) X Evaluation Grade = Goal Rating					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
1.1	Protect and enhance the natural environment, including biological and aesthetic resources.	4%			0.000
1.2	Protect and enhance Hawaii's cultural resource environment, including archaeological and historical sites.	3%			0.000
1.3	Meet the relevant environmental regulations and standards set by Federal, State, and County/City agencies. Maintain collaborative working relationships with agencies and comply with goals of their relevant plans and policies.	4%	4%		0.000
1.4	Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	3%			0.000
1.5	Promote long-term resiliency relative to all hazards mitigation, namely global climate change, with considerations to reducing contributions to climate change from transportation facilities, and reducing the future impacts of climate change on the transportation system.	6%			0.000
2. Modal Integration					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
2.1	Promote a complete (connects transportation system of motorized and non-motorized modes).	7%			0.000
2.2	Promote efficient travel between modes by creating connections and removing barriers.	3%	7%		0.000
2.3	Promote safe modal connections between transportation alternatives.	3%			0.000
3. System Preservation					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
3.1	Manage transportation assets and optimize investments.	2%			0.000
3.2	Maintain safe, efficient, complete transportation system for the long-term.	3%	31%		0.000
4. Safety					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
4.1	Plan, maintain and operate a transportation system that supports evacuation, response and recovery for incidents.	4%	1%		0.000
4.2	Promote long-term resiliency of the State through the transportation system.	4%			0.000
5. Economic Viability					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
5.1	Promote the expansion and diversification of Hawaii's economy through the efficient and effective use of transportation facilities including movement of people, goods, and services in a safe, energy efficient, and environmentally sound manner.	4%	17%		0.000
6. System Efficiency Measurement and Operations					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
6.1	Improve capacity and efficiency of the existing transportation system for long-term benefits.	7%	18%		0.000
7. Transportation Access/Availability					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
7.1	Provide appropriate and reliable transportation access options statewide to all users.	4%			0.000
7.2	Ensure transportation investments in programs and prioritization processes are balanced (across modes and demographics (i.e. serve all populations)).	3%	2%		0.000
8. Safety					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
8.1	Maintain a safe transportation system for all modes.	8%			0.000
8.2	Improve safety of the community through connectivity of the transportation infrastructure.	4%	10%		0.000
9. Additional Goals, Objectives and Strategies					
Goal Number	Goal Description	Island Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
9.1	Obtain sufficient and specific transportation funding.	3%			0.000
9.2	Expedite project delivery.	3%	1%		0.000
9.3	Promote on-going planning to assess and address statewide needs.	3%			0.000
9.4	Coordinate use of public right-of-way with other public service providers.	3%			0.000
		100%	100%	Total Rating =	0.000

The planning team reviewed projects in order from highest to lowest based on the overall solution rating. Solutions that met the Plan goal criteria better than others were listed near the top with relatively high scores. Lower ranking solutions indicated that the solution may not have met the priority goals for Hawaii District as well as other evaluated solutions.

Solution ratings also helped prioritize or identify a preferred solution when there were multiple solutions that addressed the same need. The planning team considered specific solutions, or groups of solutions, that directly addressed the set of recurring identified needs and deficiencies described in Chapter 3.

Evaluation Outcomes

The two-tier screening process evaluated potential solutions in terms of meeting Plan goals. The weighting process factored in regional and HDOT priorities. The evaluation process thereby yielded outcomes – the ordering of potential solutions – based on their ability to meet the goals and needs of Hawaii District’s federal-aid highways. The types of potential solutions relating to each of Hawaii’s priority goals are described below.

- **Capacity projects** that improve efficiency and

circulation and expand the capacity of transportation facilities to accommodate additional users were a priority. These types of solutions can include additional lanes or new roadways to increase travel options for vehicles. They can also include multimodal capacity with the addition of bike lanes and sidewalks. Capacity projects can support economic vitality, an important goal for Hawaii District, by reducing congestion near the major airports and harbors and potentially providing more reliable travel times for freight vehicles around the island. Roadway and nonmotorized capacity projects would benefit freight, tourists and residents alike by providing reduced congestion and travel route alternatives.

Capacity solutions can also involve system management projects that improve capacity within the existing infrastructure. System management projects could be those that improve reliability by consolidating access to roads that are functionally classified to carry high volumes of traffic. Roadway infrastructure capacity solutions that ranked relatively high in Tier 2 evaluation involved additional lanes on existing highways, constructing new highways, and realigning or improving facilities for nonmotorized modes on shared roadways. Capacity solutions may also include a bypass road or alternate route for resiliency. These potential solutions are shown on Exhibit 4-4 and are organized by State Route number where applicable.



Kanoelehua Avenue is one of the busiest roads in Hilo.



Based on the Tier 2 evaluation scores, the potential capacity solutions represent a “prioritized short list” that address the needs of the region and meet the roadway infrastructure goals of the Plan most effectively. These infrastructure solutions serve as input to the state’s existing capacity program. They should be considered, in addition to nonmotorized and safety capacity solutions, to address roadway deficiencies through 2035.

- **Safety projects** include both infrastructure and non-infrastructure projects and would benefit both vehicular and nonmotorized modes. Infrastructure project examples include installing lighting or guardrail along highways, considering truck runaway ramps, maintaining the integrity of roadway features like embankments, slopes, and retaining walls, and reconfiguring intersections or roadways where high numbers of documented accidents have occurred. These types of projects would not only protect human life by providing greater visibility and awareness between travel modes, but would also preserve the integrity and operations of the traveled roadway.

Maintenance of slopes is critical to preventing rockslides, which could damage vehicles and put drivers at risk, as well as block traffic and cause congestion. Providing rockfall protection would prevent erosion and may protect against potential road failures caused by heavy rains.

Potential non-infrastructure safety projects include investigating lower speed limits and educational/enforcement campaigns or programs to share safety-related information and the benefits of safe driving. These often require multiagency coordination and are supportive of multimodal integration. These types of safety solutions have been evaluated as part of this Plan, but not prioritized as a finite list. Both the state and county have procedures within their transportation safety programs to establish projects. Rather than duplicate that effort, this Plan is a source of additional guidance on Hawaii District’s safety needs based on input that surfaced through the planning process.

Existing state and county safety programs have specific subprograms that are responsible for

prioritizing and implementing potential solutions. Examples of these safety subprograms are rockfall and slope stabilization, pedestrian and bicycle needs, and guardrail and shoulder improvements. These particular subprograms align with the types of identified needs and potential solutions described above.



Hillside erosion control prevents road failures caused by heavy rains.

Another subprogram of the Safety program is the Highway Safety Improvement Program, which is responsible for addressing areas where the number of accidents is higher than average and reducing the number of serious accidents. The Highway Safety Improvement Program subprogram evaluates solutions and prioritizes them based on a benefit/cost ranking system. After a project is implemented, the subprogram monitors performance to further improve safety conditions.

The safety guidance provided in this Plan will serve as input to the HDOT and county safety programs and subprograms.

- **System preservation and maintenance projects** maintain the overall operations of the transportation system. These solutions include regular maintenance operations such as pavement resurfacing, rehabilitation, or reconstruction; bridge replacement or rehabilitation; guardrail repairs; sidewalk repairs; and vegetation clearing. System preservation solutions also include drainage improvements and erosion control measures to maintain roadway operations.

Maintaining the region’s infrastructure and assets is important because the roadway network is the



lifeline of the island. Keeping roadways and bridges in optimal form is a key factor in helping Hawaii District to build its economy and progress towards its transportation goals. System preservation projects are also designated priorities for selection to the STIP for implementation.



Pavement resurfacing will be required along Kawaihae Road.

Preserving the island's transportation system supports fiscal responsibility. The transportation network is an asset, and limited resources have been spent over the years to maintain and improve this investment. By preserving the investments already made and maintaining the upkeep of current facilities, the need for new construction may be managed.

Although the potential solutions developed to address system preservation needs were evaluated in Tier 2, specific project definitions or exact locations are not all identified or prioritized in this Plan. The HDOT and Hawaii County already have system preservation programs in place to review and prioritize preservation solutions.

Within these programs, multiple subprograms are structured to prioritize and implement projects that are related to specific assets, such as pavement or bridges. The HDOT pavement subprograms keep track of roadway conditions on Hawaii District, and strive to extend the life of those roadways through various preservation actions.

Specific subprograms that address pavement needs include:

- Resurfacing
- Rehabilitation and repairs

- Reconstruction and replacement
- Preventative maintenance subprograms

Bridges are also important assets and can be critical infrastructures on the island. Multiple subprograms are in place to manage and maintain the island's bridge inventory. Bridge needs can arise when a specific facility is found to be structurally deficient, or when a bridge requires attention through its regular maintenance cycle. When bridge needs are identified, system preservation solutions are addressed through one of the specific subprograms that manage:

- Bridge replacement
- Rehabilitation
- Preventative maintenance
- Seismic retrofit

The potential solutions developed and evaluated as part of this Plan will serve as input to state and county system preservation programs and subprograms.

- **Modal integration/Complete Streets projects** guide development of a travel way that is balanced and provides transportation options for all users (bicyclists, pedestrians, vehicles, freight, and transit).



Pedestrians safely cross Kamehameha Avenue to the transit station, Hilo.

A continuous, safe network of nonmotorized facilities considers the needs of populations that may not have the means to drive or may not be able to drive. These populations could include youth, elderly, or lower-income citizens. Improving the connectivity of nonmotorized facilities would



benefit all users and could encourage a shift towards walking or bicycling as an attractive travel alternative to driving.

Examples of modal integration projects include roads with new bicycle lanes or shared paths exclusively meant for nonmotorized modes. Multimodal projects also involve connections between different modes of travel, such as a providing a walking path between pedestrian attractors, or improving access to transit from bicycle lanes or pedestrian trails. These types of projects are integrated into and implemented by other existing programs such as state or county system preservation, safety, and capacity programs. These programs or subprograms are responsible for prioritizing and implementing multimodal projects.

- **Security and resiliency projects** improve the roadways' ability to provide reliable operations during threats or emergencies, and to support response or evacuation during natural disasters. Improving and maintaining roadways to provide continual emergency access is especially important to Hawaii District because of the limited availability of parallel or alternate routes. Topography could present an obstacle to responding to catastrophic events such as lava flows, tsunamis, and earthquakes.



Hilea Bridge along Mamalahoa Highway is over 50 years old and needs to be rehabilitated or replaced.

Emergency access needs are addressed by projects implemented by state and county system

preservation, safety, and capacity program categories.

- **Transit projects** are key contributors to helping HDOT achieve its future multimodal goals. Transit projects support objectives such as increasing capacity by reducing the number of private vehicles on roadways, realizing safety benefits from reduced congestion. Fewer vehicles, increasing transportation access and mobility for people who are unable or choose not to drive, integrating modes to increase transportation choice, and supporting economic vitality. Expanded and comprehensive transit systems can extend the length of bicyclist and pedestrian trips, opening up more destinations for those modes. Transit vehicles can also accommodate more people per vehicle than private vehicles, potentially reducing future congestion. Fewer vehicles and less congestion can lead to improved safety on roadways.

Examples of transit solutions could include additional or more frequent routes, expanded service to rural areas of the island, and better integration with bicycle routes or pedestrian paths. Additional transit infrastructure projects to address future ridership include upgraded, well lit bus stops, new bus shelters, improved amenities, improved sidewalk and bicycle connections to transit stops and major hubs from residential and commercial areas, or way finding signage for transit users.

Transit service and transit-related projects are implemented by the Hawaii County Mass Transit Agency (also known as Hele-On Bus). Coordination between the transit agency and the state's existing programs occurs during planning, implementation, and operation of transit services to ensure that roadway facilities adequately support transit vehicles and amenities. By closely coordinating resources and planning efforts, an effective intermodal transportation system can be provided.

Transit projects and services are funded in part by the County and by the Federal Transit Authority. Additional funds are collected at the farebox. Even though rides are \$2.00, farebox revenues are unlikely to cover much of the funding needs.



These funds support transit service operations and maintenance of transit vehicles, and are tracked separately from the state's funding mechanisms. Transit funds are accounted for separately because they primarily support the operations and maintenance of transit (verses infrastructure).



Transit shelter along Mamalahoa Highway.

The county is responsible for Hele-On Bus, and project priorities are set by the Transit agency. The HDOT does not fund or set their priorities. Future plans for the Hawaii Mass Transit Agency include purchasing new buses, increasing service and routes, and providing service to specific destinations. Currently, the Hele-On fleet has 18 transit routes served by 51 buses and carries 1.2 million passengers a year. In 2012, Hawaii County received \$1.2 million in Federal Transit Authority funding to purchase three new buses for its Hele-On fleet. The new buses will be wheelchair accessible, air-conditioned, and equipped with bicycle racks.

While transit can support other goals of the Plan, addressing Plan goals can also support transit operations: system preservation can reduce transit travel time, reducing costs for the agency, and making transit a competitive travel option to private vehicles. Capacity and congestion projects also reduce transit vehicle travel times and help maintain schedules, as buses are currently subject to the same congestion that affects cars.

Cost Estimates

The planning team developed planning level cost estimates for all Tier 2 potential solutions. Cost estimates were based on conceptual drawings, preliminary project descriptions, bid tabulations, typical contingencies, and average construction costs per vehicular lane mile. The team used current prices to develop estimates. Due to relatively flat growth in the State of Hawaii in recent years, these estimates reflect fiscal year 2011 prices.

Estimated planning level costs are important variables for each solution because they allow the solution to be evaluated against fiscal constraints, another tool that decision-makers can use to determine which projects move forward. Prior to being able to implement any range of solutions, the state and county must logically plan and program individual transportation improvements to address priority deficiencies and maximize investments.

Recommendations

Based on the identified needs and deficiencies, the planning team reviewed potential solutions with the highest Tier 2 evaluation ranking. The team also considered cost estimates and the degree of benefit (certain solutions may impact more users or address a more defined need compared to other solutions).

The outcome was a list of potential solutions that reflects Hawaii District's unique needs and priorities. It is important to note that this list is one tool for decision-makers to use when allocating funding for transportation projects. Many of the high-ranking projects meet all of Hawaii District's priority goals, but may be very expensive or complex to implement. They may not be feasible to implement in the next STIP or Mid-Range Plan (described in Chapter 5), but remain on the list so that the Plan can be used as a guide to thoughtfully and deliberately apply future transportation funding and provide a long-term vision of the future of transportation on the island.



Based on current dollars, implementing the recommended list of long-range potential solutions would cost approximately \$7.4 billion. This long-range set of solutions includes projects to address system preservation, safety, capacity, and congestion needs as well as multimodal infrastructure solutions. Both the HDOT and the County have funding programs that can help address these priorities.

The \$7.4 billion total cost is unconstrained, meaning that potential solutions are recommended based on need and the ability to meet Plan goals, as opposed to fiscal limitations. Also, because this is a long-range plan many of the potential solutions have not been planned or designed yet, and therefore do not currently have identified or committed funding sources. The next section addresses how to use this unconstrained list to move projects forward into implementation.

The total cost of the Tier 2 solutions by funding program for projects in this Plan is included on Exhibit 4-3. System preservation projects would cost roughly \$1.1 billion, or approximately 15 percent of the total unconstrained cost, while safety related projects for all modes would cost \$960 million, or roughly 13 percent of the total. Capacity projects include facilities for bicycles and pedestrians, as well as large-scale roadway infrastructure solutions. These roadway infrastructure projects often provide benefits to circulation or alternate access in addition to capacity. Unconstrained capacity solutions would cost \$4.1 billion in current year dollars, or over 55 percent of the total cost. Potential solutions to address congestion would cost around \$405 million, while other solutions, such as circulation or access studies and landscaping or aesthetic projects, would cost \$795 million.

Exhibit 4-3. Plan Cost Estimates by Funding Program

Funding Program	Plan Cost Estimates
System Preservation	\$1.1 B
Safety	\$960 M
Capacity (non-constrained)	\$4.1 B
Congestion	\$405 M
Other	\$795 M
TOTAL	\$7.4 B

Implementing the potential capacity solutions on the short list shown on Exhibit 4-4 would require over \$1.6 billion in current year dollars. These potential solutions are identified separately due to their relatively large scale. In addition, these potential solutions usually cost more and take longer to implement than other capacity projects and projects in other programs.

These potential capacity solutions do not represent the only priority capacity solutions for the district. Capacity solutions to address bicycle and pedestrian needs and safety deficiencies are also included in this Plan and considered necessary for optimal operation of the island’s transportation system. As shown on Exhibit 4-3, the cost of implementing the full array of capacity solutions to address anticipated deficiencies would be approximately \$4.1 billion through Year 2035.

Based on the high estimated cost of addressing Hawaii District’s priority transportation needs, the region will need to make hard decisions about where to invest and where to allocate funding. The reality of limited funding with competing needs must be examined closely so that dollars are effectively spent to best meet the identified goals and objectives while addressing transportation system deficiencies.



Exhibit 4-4. Potential Long-Range Capacity Solutions

Route Number	Jurisdiction	Project Title	Project Description	Estimated Cost FY 2011 (\$)
11	State	Mamalahoa Highway - Mountain View to Keaau	Improve/provide additional 2 travel lanes with turn lanes at major intersections	\$173,001,000
11	State	Mamalahoa Highway - Keaau to Makalika Street	Improve/provide additional 2 travel lanes between Makalika Street and Keaau-Pahoa Bypass Road	\$89,292,000
11	State	Kanoelehua Avenue - Makalika Street to Kalaniana'ole Avenue	Improve/provide additional 2 travel lanes with turn lanes at major intersections, bicycle facilities and sidewalks	\$120,718,000
19	State	Kawaihae Road - Kohala Mountain Road to Mamalahoa Highway	Improve/provide additional 2 travel lanes with turn lanes at major intersections	\$69,113,000
19	County	Mamalahoa Highway - Mud Lane to the North Hawaii Community Hospital	Improve highway to include bicycle facilities, shoulders, and turn lanes	\$34,000,000
130	State	Keaau-Pahoa Road	Improve/provide additional 2 travel lanes between Keaau-Pahoa Bypass Road and Kapoho Road	\$172,499,000
1100	State	Kuakini Highway - Henry Street to Kamehameha III Road	Improve/ provide additional 2 travel lanes and include bicycle facilities and sidewalks	\$83,276,000
1370	State/County	Kalaniana'ole Avenue - Kanoelehua Avenue to Hilo Harbor	Improve/provide additional 2 travel lanes with turn lanes at major intersections, bicycle facilities and sidewalks	\$28,026,000
1880	County	Ane Keohokalole Highway - Hina Lani Street to Kealakehe Parkway	Improve existing roadway to include bicycle lanes and intersection upgrades	\$8,879,000
2000	State	Puainako Street - Kanoelehua Avenue to Komohana Street	Realign/provide additional 2 travel lanes between Kanoelehua Avenue and Komohana Street to include sidewalks	\$65,000,000
2790	County	Mohouli Street - Komohana Street to Kilauea Avenue	Improve/provide additional 2 travel lanes between Komohana Street and Kilauea Avenue	\$28,165,000
N/A	County	Alii Highway - Kamehameha III Road to Queen Kaahumanu Highway	Construct a new 2-lane roadway between Kamehameha III Road and Queen Kaahumanu Highway	\$105,000,000
N/A	County	Ane Keohokalole Highway - Hina Lani Street to Kaiminani Drive	Construct a new 2-lane highway between Hina Lani Street and Kaiminani Drive with bicycle facilities and sidewalks	\$35,937,000
N/A	State	Kealakehe Parkway - Keanalehu Drive to Kealakaa Street	Construct a 2-lane roadway extension between Keanalehu Drive and Kealakaa Street	\$20,712,000
N/A	County	Nani Kailua Drive - Hualalai Road to Alii Drive	Construct a new 2-lane connector roadway between Hualalai Road and Alii Drive	\$9,619,000
N/A	County	Mid-Level Road (Puna Makai Alternate Route)	Construct a new 2-lane connector roadway makai of Keaau-Pahoa Road between Hilo and Pahoa	\$288,536,000
N/A	State	Kawaihae Bypass - Mamalahoa Highway to Akoni Pule Highway	Construct a new 2-lane highway with turn lanes at major intersections	\$264,702,000
N/A	County	Alii Highway Extension (Hokulia Bypass) - Halekii Street to Napoopoo Road/Mamalahoa Highway	Construct a new 2-lane roadway between Halekii Street and Napoopoo Road/Mamalahoa Highway	\$20,417,000
N/A	State	Saddle Road Extension – Mamalahoa Highway to Queen Kaahumanu Highway	Construct a new 2-lane road between the western terminus of the Saddle Road realignment and Queen Kaahumanu Highway	\$180,000,000

Note: This list is organized by State Route number and not by priority. Although not listed here, capacity solutions also include safety improvements and multimodal facilities. This list is not fiscally constrained and these solutions would have to be compared against those of other necessary programs, such as system preservation and safety, when decision-makers make funding recommendations.





Chapter V

Implementation

V. Implementation

This Plan is the vision of what the 2035 transportation system would be absent any financial constraints over the 20-year planning horizon. How do we move forward from today to 2035?

Connecting this Long-Range Plan and the Statewide Transportation Improvement Program

As mentioned earlier, this Plan sets the transportation vision and long-term land transportation plan for the District of Hawaii. The STIP is a set of identified improvements that can be reasonably expected to be completed with available funds over a 4-year period. It is one mechanism for implementing this long-range plan.

With short-range planning focused on financial necessity and long-range planning focused on system need, it is critical to provide a bridge between the two to ensure that current investment decisions are helping the region move towards its long-range goals. The Mid-Range Plan provides the link between the long-range plan and the STIP, and helps the state and the regions make difficult funding decisions using an objective and transparent method.

Mid-Range Plan

Solutions considered in the Plan are focused on meeting identified deficiencies by program category and are not based on fiscal constraints. It is known that available transportation resources over the planning horizon of the long-range plan will only cover approximately 16 percent of the identified needs for the District of Hawaii. This does not even include the needs of transit programs which are funded out of other transportation revenue sources. With limited funds available, it is critical to identify the high-priority programs and projects to aid in effective decision-making.

Prior to implementing the full range of solutions, the state and region need to logically plan and program

individual transportation improvements to address priority deficiencies to maximize investments. The Mid-Range Plan is the link between this 20+ year long-range plan and the four-year STIP and is intended to assist the HDOT Highways Division in meeting its long-range goals as efficiently as possible. By planning two biennia beyond the adopted STIP, the Mid-Range Plan provides a roadmap to the future that is consistent with the region's long-range plan. The Mid-Range Plan can also serve as an opportunity to make any necessary course corrections in funding priorities in the STIP needed to achieve the long-range plan objectives.

The Mid-Range Plan can be updated as forecasts for transportation revenue change due to changing economic conditions or new transportation resources. As revenue projections change, projects can move in or out of the plan based on the overall ranking amongst all the other projects in the plan. The project list that has been created using a transparent and repeatable process that ranks solutions based on a standard set of criteria that incorporate economic, environmental, and social objectives will ensure that the mid-range plan can be adjusted readily and in a reasonable and transparent fashion.

The mid-range set of project solutions is fiscally constrained, acknowledging the limited amount of transportation funds and responsibly allocating or assigning funds to priority projects. Although financial resources are limited, funds have been set aside or programmed for implementing mid-range projects. Recognizing fiscal constraints is a critical step in converting a long-range plan into a set of implementable projects—the long-range plan can be seen as the transportation “wish list,” and the mid-range plan is what is achievable given current funding within an 8- to 10-year horizon. The fiscally constrained mid-range plan will ensure that the



Highways Division has a clear set of priorities to make informed decisions with limited funding. The Mid-Range Plan will be updated more often than the long-range plan, and allow the HDOT to plan, identify, and commit to projects earlier than the STIP process. It also allows more flexibility if expected funding is above or below anticipated levels, providing a venue to adjust project lists prior to STIP development.

The combination of a long-range plan based purely on need and a mid-range plan that is fiscally constrained is an important prioritization and communication tool for transportation planning. By clearly establishing a baseline of available resources for transportation investment while understanding the long-term needs of the system, data can inform discussions of future transportation resources and where they should be spent. This helps the community understand the trade-offs of investing more or less in certain transportation programs and can lead to better informed transportation investment decisions that are fully understood by a wide variety of stakeholders.

To bridge the gap between the current transportation system and the future 2035 long-range system, the state will develop a mid-range set of solutions over an 8 to 10-year period.

STIP

The district long-range Plan and mid-range plans provide guidance to and feed projects into the STIP. The STIP connects the projects with the specific funding programs and allocates funds to implement project solutions for a 4-year period. As projects are programmed and budgeted, they move into the project

delivery stage. During the project delivery stage, a more thorough engineering analysis will be conducted on the project’s feasibility and an environmental assessment of environmental impacts will be prepared. During this time, the project will further evolve and may change from the initial analysis conducted in this Plan.

Exhibit 5-1 shows the progression of solutions through the long-range Plan, Mid-Range Plan, and STIP. It also shows how projects are narrowed from the long, aspirational list in the long-range plan, to the shorter, fiscally constrained list in the Mid-Range Plan, and finally the list of projects that can be implemented and are able to be funded given existing revenues in the STIP. The integrated statewide long-range planning processes guide the development of a priority plan where the state and regions look at how to fund solutions. The STIP and program management is where the projects are further developed through environmental, preliminary engineering, design, and move into construction.

Creating a policy framework for roadway project prioritization is geared towards preserving the National Highway System and existing federal-aid highways. MAP-21 includes provisions to support the condition and performance of the NHS to ensure that investments in highway construction help achieve performance standards and state goals including infrastructure condition, safety, mobility, or freight movement. Similarly, the Federal Transit Authority prioritizes maintaining and operating the existing public transportation facilities and vehicles efficiently.

Exhibit 5-1. Implementation from Long-Range Plan to STIP



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Funding

Identifying and matching funding to projects is a crucial step in implementing the Plan. The Hawaii Statewide Transportation Planning Process requires coordination between policy and planning activities and funding and implementation activities.

Transportation funding in the State of Hawaii comes from a combination of federal and state funds, and Hawaii, like many other states does not have unlimited transportation funding to meet all operations and maintenance costs and capital improvement costs.

There is a gap in the anticipated funding and the list of needed transportation projects. The Plan is one tool to identify regional priorities that help Hawaii District meet state and regional transportation goals and focuses project efforts with limited resources. The Plan also provides the basis for future transportation improvement decisions as the HDOT completes projects, identifies new needs, and develops additional projects.

The following section summarizes expected future state and federal funding sources for the State of Hawaii's Highway Fund through 2035 as well as Hawaii District fund allocations from Highways Division Programs, potential funding shortfalls, and possible contingency measures to mitigate funding gaps.

Federal Funding

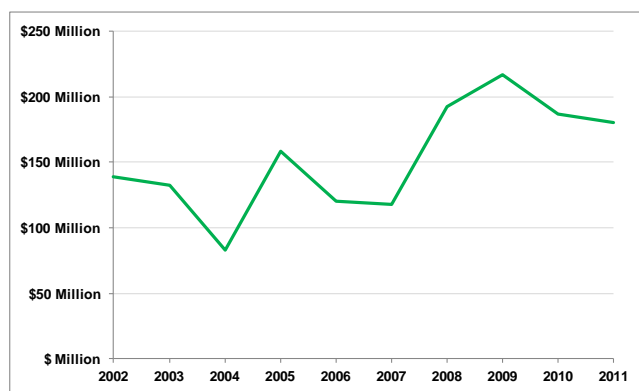
Historical Funding Levels

Federal funds come from the Highway Trust Fund and are raised primarily through the federal gas tax. The United States federal excise tax is 18.4 cents per gallon on gasoline and 24.4 cents per gallon for diesel fuel. Federal funding is intended for the maintenance and construction of the federal highway system and for major arterials and collectors that feed into the highway system. Over the past decade, annual federal funding has ranged from a low of \$82 million in Fiscal Year (FY) 04 to a high of \$217 million in FY09. From FY02 through FY11 the average annual federal contribution to transportation revenue in the State of Hawaii has been approximately \$152 million. This is reflected on Exhibit 5-2.

MAP-21

The adoption of MAP-21 in July 2012 changed federal funding methods for future fiscal years. MAP-21 changes the way program funding is distributed to individual states. Previously, core federal highway programs were able to distribute funds to states using individual formulas. With new legislation, a lump sum is distributed to states proportionally (based on 2012 distributions received under SAFETEA-LU), and states are able to distribute funds internally to their core programs, with flexibility to transfer funds from one program to another.

Exhibit 5-2. Federal Contribution to State of Hawaii's Transportation Funding



With MAP-21, funding methods and amounts through FY14 may not be aligned with the historic trend of the last decade and beyond FY14 the amount of future federal dollars that Hawaii District will receive for the highway system is unknown. Therefore, in order to present a conservative estimate of available federal funds, the Plan assumes a constant average amount of approximately \$152 million annually through the long-range planning period.

The Highway Trust Fund, dependent upon the gas tax, has been decreasing for all states over the past few years as the vehicle fleet becomes more fuel efficient and per capita vehicle miles traveled continues to decrease nationwide. The Congressional Budget Office estimates that the Highway Trust Fund will not be able to sustain current levels of expenditure before the end of FY14 without additional funding.



State Funding

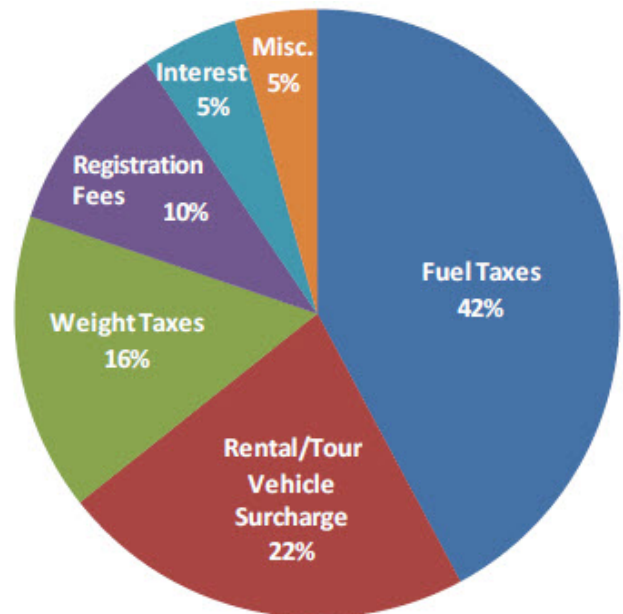
State funds come from six primary sources: fuel taxes, rental/tour vehicle surcharges, weight taxes, vehicle registration fees, miscellaneous fees, and interest from invested highway funds.

- **Highway Fuel License Tax** – Currently, the highway fuel tax is \$0.17 per gallon of gasoline and diesel oil for highway use and \$0.02 per gallon of gasoline, diesel oil, and liquid petroleum gas for non-highway use. The fuel taxes are collected by the Department of Taxation and transferred to the State Highway Fund. In FY11, the highway fuel tax contributed approximately \$89.0 million to the State Highway Fund.
- **Vehicle Registration Fees** – The State vehicle registration fee increased from \$25 per vehicle to \$45 per vehicle in 2011. In FY11, the registration fees contributed approximately \$20.8 million to the State Highway Fund.
- **Weight Taxes** – All vehicles, including motor vehicles, are assessed an annual state vehicle weight tax. The tax increased in 2011 to \$0.0175 per pound. The maximum charge for a vehicle increased to \$300 per vehicle. The additional weight tax is expected to result in an increase in net revenues of nearly \$33.0 million in FY13. In FY11, weight taxes contributed approximately \$33.4 million in revenues to the State Highway Fund.
- **Rental/Tour Vehicle Surcharge** – The rental/tour vehicle surcharge imposes a daily tax on the rental of all motor vehicles and tour vehicles. In FY11, the rental and tour vehicle surcharge contributed approximately \$43.9 million to the State Highway Fund.
- **Interest** – This is income derived from the investment of Highway Special fund money held by the State. In FY11, interest income was approximately \$4.0 million.
- **Miscellaneous** – Miscellaneous revenues include permit fees, driver license fees, inspection fees, rental fees, and other miscellaneous revenues.

Over the past decade of transportation funding, more than 60 percent of all state revenues have been generated from fuel taxes and rental/tour vehicle surcharges. Even after factoring in the impacts of the 2007-2009 recession on fuel and rental surcharges in FY09-FY10, revenue from fuel taxes, rental surcharges and registration fees have increased approximately 2 percent per year over the past decade. Exhibit 5-3 represents the breakdown of revenues by sources for FY11.

While federal funding is projected to remain constant, state funding revenues are expected to grow on an annual basis of approximately 1 percent per year. This growth rate is consistent with growth rates presented in the 2011 Highway Revenue Bonds Official Statement. The Expenditure and Funding Summary memorandum in Appendix G includes a detailed description of both state and federal revenue sources.

Exhibit 5-3. FY11 Breakdown of Revenues by Source



Based on estimated federal funding and state revenues, the total combined transportation funding for the State of Hawaii could be expected to increase to nearly \$495 million annually by 2035 (FY11 total is approximately \$400 million). This results in cumulative total estimated revenue of \$11.10 billion from 2011 through 2035. These values are not adjusted for inflation.



Inflation

Per HDOT policy (Memorandum 2.6453, dated December 8, 2007), an inflation rate must be used when developing financial plans that include projects funded by federal dollars in the STIP. The HDOT has developed a methodology that uses the average inflation rate as reported by Consumer Price Index data to estimate a constant inflation rate for all financial planning. Based on inflation data from 2003 to 2006, a constant inflation rate of 4 percent per year was calculated and assumed for project costs in this Plan. The Highways Division Staff Services Office is responsible for validating and updating the inflation rate each budget cycle.

With project costs escalating at a constant 4 percent per year and state revenue sources increasing at 1.3 percent per year while federal sources stay flat, the buying power of the transportation revenue sources will decrease in real terms between now and 2035.

When adjusted for inflation, real federal and state revenues available for transportation projects between FY11-FY35 would total approximately \$7.01 billion.

An annual revenue stream of \$495 million dollars in FY35 is worth \$193 million dollars in FY11 dollars. This is approximately 55% of the \$350 million dollars that the State had to spend on transportation in FY11.

Future Funding

Historically, Hawaii District has received approximately 17 percent of the State's Highways Division funds. Based on historic distributions, Hawaii District could expect to receive approximately \$1.2 billion dollars (adjusted for inflation and expressed in FY11 dollars) for transportation projects between FY11-FY35. As shown on Exhibit 5-4 and shared in Chapter 4, there is a \$7.4 billion cost to implement all the solutions needed to address future transportation deficiencies.

Exhibit 5-4. Plan Cost Estimates by Funding Program

Funding Program	Plan Cost Estimates
System Preservation	\$1.1 B
Safety	\$960 M
Capacity (non-constrained)	\$4.1 B
Congestion	\$405 M
Other	\$795 M
TOTAL	\$7.4 B

By defining the goals and objectives early on and using the seven-step process for solution evaluation, the highest priorities for the District of Hawaii can be implemented.

The current outlook indicates a significant funding gap, and based on historical trends this gap is not expected to close as time passes. While funding gaps may narrow slightly, shortfalls in available dollars will likely always be a key factor in planning and prioritizing for the future. With this in mind, a sound prioritization process must be the tool to help decision-makers work through difficult choices.

The evaluation and prioritization processes used in this Plan look at the transportation system comprehensively and incorporate goals and values that were agreed upon at inception. It provides a strategy for moving forward with implementation, which will effectively use the funds available for addressing the needs of the transportation system. Key decision-makers continuing to use these processes should feel comfortable knowing that the community's values are being represented in the program priorities. According to past program distributions and the Plan's goal weighting priorities, Exhibit 5-5 below shows the planned future funding distribution.

Exhibit 5-5. Future Funding Distribution by Program

Funding Programs	Distribution Percentages
System Preservation	45%
Safety	18%
Capacity	25%
Congestion	10%
Other	2%
Total	100%



This planned distribution of future funds is consistent with the stakeholder goals mentioned in Chapter 2 to:

- Improve capacity and system efficiency by addressing congestion.
- Maintain and improve safety for all modes.
- Expand and increase Hawaii District's economic vitality.
- Preserve and maintain the existing transportation system.
- Provide modal integration and improve transit service.
- Support evacuation and emergency access/egress during incidents.

Future distribution of funds is also consistent with MAP-21. While investing in the transportation system could involve new facilities, MAP-21 guidance is largely focused on improving or enhancing current assets, and preserving and maintaining the condition of existing infrastructure.

The majority of MAP-21 federal highway funds are dedicated to strengthening the National Highway System, which includes key principal arterials, through preservation and improvement of priority roadways in the existing federal-aid network. Additional information regarding MAP-21's performance goals are shared later in this section.

Supplemental Funding and Non-Funding Strategies

State and federal funding sources have not kept up with the demands of the highway transportation system. The fuel tax, which is the largest contributor to the state's transportation budget, is levied based on fuel consumption and is subject to volatility in usage patterns. Consumption patterns can be impacted by improved vehicle efficiency and overall economic conditions. Other tax based revenue streams are subject to legislative approval and are not modified on a regular basis to keep pace with increasing needs and costs.

This shortfall between anticipated funding levels and funding needs is not unique to Hawaii; a consortium of states is studying alternatives to the gas tax to fund

highways, and there are a number of pilot projects throughout the nation looking into road usage charges, where drivers pay based on the miles they drive. In 2015 the state of Oregon will start a pilot program of 5,000 drivers to test a number of data collection methods and fee structures.

The state is not expected to have the funding available to implement all of the solutions recommended in the Plan. A funding shortage will likely mean deferral of needed projects and may delay improvements to safety, congestion relief, and infrastructure preservation. Unpredictability in funding sources for transportation projects makes it difficult to plan for future facilities. Delays to improvements in the transportation system lead to frustration among the taxpaying citizens who expect the highway infrastructure to keep up with the growing demand.

While this Plan provides critical guidance for decision-makers, especially during times when needs exceed available funding, the state may also consider a variety of methods and potential alternative revenue sources to continue to fund the needs of the transportation system. Appendix H summarizes potential future funding strategies and other revenue sources that could be considered by the Legislature and other governing bodies, including:

- **Mileage-based user fees** – Drivers pay a fee based on the number of miles traveled on public roadways. Private roadways would be excluded. Mileage could be tracked through various methods, and prices could be set based on congestion, location of travel, type of road, or a flat fee per mile. A number of states are implementing pilot programs to study this as a viable alternative to the gas tax.
- **Special general excise tax on automotive parts and services** – Taxes would be collected through the performance of specific services (such as vehicle inspections or repairs) and the sale of equipment related to motorized vehicles.
- **General excise tax increase** – A portion of revenue from an increase in the general sales tax could be allocated to transportation improvements and projects.



- **Public/private partnerships** – An agreement between a private entity and a public agency to deliver transportation projects, typically with greater involvement and risk taken by the private entity.
- **Impact fees on new development** – Private developers pay a predetermined fee per development unit. This fee is based on the number of vehicle trips expected to be generated by the potential development.
- **Bicycle registration** – A bicycle licensing system could be developed, and user fees could be collected based on the type of bicycle registered. Fees could support maintenance and upkeep of bicycle lanes and shared roadways.
- **Carbon tax/cap** – A fee or tax could be imposed on producers of large amounts of carbon. These producers would pay a fee to ‘offset’ their carbon production.
- **Increase current funding sources** – Because new sources of funding are difficult to identify, increasing the existing mechanisms – such as raising the rental/tour vehicle surcharge or vehicle weight tax – could generate additional revenue.
- **Tolls** – Drivers pay a fee each time a specific public roadway is used or a certain bridge is crossed. Toll fees may change based on the time of day. Tolling in Hawaii would require Legislature to change the current laws that prohibit toll charges.
- **Grant anticipation borrowing** – This strategy allows public agencies to borrow against anticipated future federal and/or state revenues to fund capital projects that require large upfront expenditures. Existing programs include Grant Anticipation Revenue Vehicle bonds for highways and Grant Anticipation Note bonds for transit.
- **State infrastructure banks and other revolving loan funds** – These are lending organizations initially funded with federal grants and/or state funds and operated at the state level. These funds leverage federal and state resources by lending rather than granting federal-aid funds, and can attract nonfederal public and private investment.
- **Bonds** – Bonds are issued by the state or other agency to finance assets with long useful lives (such as transportation projects). The administering entity issues bonds with a set return on investment, and investors purchase the bonds to help fund transportation projects. Bonds help smooth the impact of large expensive projects by providing upfront capital, and allowing the state or county to repay over a set amount of time.
- **Land swaps and donated lands** – This strategy is not a funding source per se, however, right-of-way costs can be a large portion of total transportation project costs. Working with land owners to either swap land for right-of-way or to donate land for a project could be a way to reduce project costs. Donated land could also be used as a local match to leverage federal funding.

Reducing Transportation Infrastructure Funding Needs

In addition to identifying and implementing transportation projects to address identified needs, there are a number of other strategies to reduce the demand on the transportation system and meeting future needs without investing directly into the vehicle transportation network. The two main strategies are described below.

Land Use Planning

Transportation and land use are closely linked. Transportation demand is derived from surrounding land uses, where certain types of land uses and more intensive development are known to generate greater travel demand. The demand for auto-based travel—and the concomitant need for roadway investment—can be influenced through land use decisions and urban design. For example, the development of denser, mixed-use areas or “20-Minute Neighborhoods” often leads to greater travel options for community members. Private auto use declines when the environment is attractive to pedestrians, bicyclists, and transit users. But achieving land use changes requires zoning codes and regulations that allow for mixed uses and flexible design.



Transportation Demand Management Strategies

Another way to reduce the need for transportation infrastructure funding is to reduce the vehicle demand on roadways. There are a number of strategies that states and counties can implement to help manage travel demand. Most strategies aim to change the mode of travel, the time of travel, or to replace the trip with other options, as described below:

- **Make bicycling attractive** – Require bicycle-friendly facilities, such as easily accessed and secure bike parking and storage, showers at destination locations (including employers), and other amenities.
- **Make walking attractive** – Require sidewalks and pedestrian infrastructure such as mid-block crossings, pedestrian activated signals, and shaded routes. Change land use patterns or zoning codes to create more walkable districts and improve connectivity among pedestrian destinations.
- **Make transit attractive** – Increase the number of transit routes, expand service hours, and shorten headways to improve the overall transit network. Create a transit pass program with large employers, subsidize passes for employees or residents, and create transit priority corridors to ensure transit is an attractive option to the single-occupancy vehicle.
- **Make ridesharing attractive** – Implement education and ride-matching programs to increase the number of people per vehicle, and reduce single-occupancy vehicles on the roadway. Work with employers and high-volume destinations to implement ridesharing programs through incentives such as preferential parking. Explore social media and mobile apps to facilitate connections between program participants.
- **Make parking more expensive** – Implement parking pricing in high-demand areas to increase the cost of driving alone.
- **Change travel times** – Work with employers to implement flexible work schedules to reduce congestion during peak travel times.

- **Reduce potential trips** – Work with employers to implement teleworking to reduce the amount of trips employees take to work.

Performance Goals

Measuring the performance of the roadway system after projects are implemented is an important part of the overall long-range planning process. Once in place, individual projects or systemwide improvements should help to maintain or enhance operations by addressing identified needs and deficiencies. To evaluate how well a particular project is performing, the transportation system should be monitored and results should be measured against a set of predetermined performance goals or targets.

Meeting these targets would mean that the implemented project was appropriate, and value has accrued from the dollars invested; in theory, the transportation system is better because the project was constructed. If targets are not met, further changes should be investigated to continue striving towards the goal. Ongoing tracking of system performance would provide valuable information to guide future planning for evolving needs.

MAP-21 legislation supports a performance and outcome-based state highway program, and provides a set of broad national transportation performance goals intended to help states invest their limited funds efficiently.

To supplement this focus, MAP-21 performance goals include:

- **Safety** – Significantly reduce traffic fatalities and serious injuries on all public roads.
- **Infrastructure condition** – Maintain highway infrastructure assets in state of good repair.
- **Congestion reduction** – Significantly reduce congestion on the National Highway System.
- **System reliability** – Improve the efficiency of the surface transportation system.
- **Freight movement and economic vitality** – Improve freight networks, strengthen the ability of



rural communities to access national and international trade markets, and support regional economic development.

- **Environmental sustainability** – Enhance transportation system performance while protecting and enhancing the natural environment.
- **Reduce project delivery delays** – Reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies’ work practices.

The MAP-21 performance goals align with the planning factors of this Plan, as shown on Exhibit 5-6.

The planning factors have been the framework of the Plan from the start, and have guided the creation of the goals and objectives, identification of needs, and the development of prioritized potential solutions.

The HDOT programs currently collect data for use in maintenance cycles and priority setting. Each program will set up performance measures that are consistent with their program’s goals and objectives and MAP-21.

With limited funding for state highway programs, it is critical that investments provide value and work towards achieving the desired outcome. Because the potential solutions have been shaped around the planning factors, the investments made to implement these solutions are aligned with the MAP-21 national performance goals.

Exhibit 5-6. Planning Factors and MAP-21 Performance Goals

Federal Planning Factors	MAP-21 Performance Goals
<p>Environment and Sustainability – Develop solutions that meet our transportation needs without compromising the ability of future generations to meet their own needs; develop solutions that promote energy conservation, improve the quality of life, and address climate change.</p> <p>Modal Integration – Expand transportation options and make connections between modes such as public transit, automobile, bicycle, and pedestrian.</p>	<p>Environmental Sustainability – Enhance transportation system performance while protecting and enhancing the environment.</p>
<p>System Preservation – Maintain a regular schedule of rehabilitation, reconstruction, and replacement to keep the multimodal system operating safely and efficiently.</p>	<p>Infrastructure Condition – Maintain highway infrastructure assets in state of good repair.</p> <p>System Reliability – Improve the efficiency of the surface transportation system.</p>
<p>Security – Ensure the secure operation of the land transportation system by involving multiple agencies to work together to achieve common goals of risk management, incident detection, response, clearance, and preparation for and recovery from disasters.</p>	<p>System Reliability – Improve the efficiency of the surface transportation system.</p>
<p>Economic Vitality – Support industry, tourism, cultural, and recreational opportunities by reducing travel time, operating costs, travel distance, crashes, and logistics inefficiencies.</p>	<p>Freight Movement and Economic Vitality – Improve freight networks, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.</p>
<p>System Efficiency Management and Operations – Optimize the performance of existing infrastructure; provide reliability and predictability within the transportation system and between modal choices.</p>	<p>Congestion Reduction – Reduce congestion on the National Highway System.</p> <p>System Reliability – Improve the efficiency of the surface transportation system.</p>
<p>Transportation Access Mobility – Enhance both infrastructure and services to improve mobility, consistency, and equity.</p>	
<p>Safety – Increase traveler safety through engineering, education, and enforcement programs and campaigns, and improve regulations and research efforts.</p>	<p>Safety – Reduce fatalities and serious injuries on all public roads.</p>



Additional Strategies

This Plan provides the framework to prepare Hawaii District's land transportation system to meet the needs of its residents and visitors by 2035. In addition to prioritization processes and funding mechanisms, this Plan includes additional strategies that could provide further benefit to Hawaii District's land transportation system. These strategies include:

- Improve coordination between jurisdictions and align efforts earlier in planning processes. By sharing information on future infrastructure or facilities well in advance, state and county funds may be identified or set aside earlier to ensure they are there for the highest priority needs.
- Incorporate policies through legislation to require planning of balanced, integrated transportation systems throughout Hawaii District's communities.
- Promote transit options and increase visibility of available transit infrastructure and service. Strive to effectively link customers and transportation services.
- Incorporate policies to designate freight routes or truck routes on roadways adjacent to airports and harbors. Provide optimum travel paths for freight vehicles to distribute cargo efficiently.
- Emphasize the functional classification of roadways and ensure that transportation facilities are appropriately sized and located. Ensure a land transportation system which allows local trips to be conducted primarily on the local roadway system in urbanized areas.
- Accelerate delivery of transportation projects and gain benefit from time and cost savings through design-build or construction-contractor partnerships. This is consistent with the FHWA's Every Day Counts Initiative and MAP-21's performance goal of reduced project delivery delays.





Chapter VI

References

VI. References

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Appendix A

Highway Functional Classification Maps

Highway Functional Classification: Island of Hawaii

ROUTE	ROADWAY NAME AND EXTENT	BEGIN MP	END MP	HPMS Code	RURAL/ URBAN/ NHS	MILEAGE BY FUNCTIONAL CLASSIFICATION					
						INTERSTATE	FREEWAY & EXPRESSWAY	ARTERIAL		COLLECTOR	
								PRINCIPAL	MINOR	MAJOR	MINOR
11	Kanoelehua Avenue/Volcano Road : Kamehameha Avenue (Route 19) > Old Keaau-Paho Road (Route 139)	0.00	7.30	3	Urban NHS			7.30			
11	Volcano Road/Mamalahoa Highway : Old Keaau-Paho Road (Route 139) > 0.01 miles past Capt. Cook Village Road	7.30	109.22	4	Rural				101.92		
11	Mamalahoa Highway/Kuakini Highway/Queen Kaahumanu Highway : 0.01 miles past Capt. Cook Village Road (end of state highway) > Palani Road (Route 190)	109.22	122.08	3	Urban NHS			12.86			
19	Kuhio Street/Kalaniana'ole Street/Kamehameha Avenue/Pauahi Street/Bay Front Highway/Hawaii Belt Road : entrance to Kuhio Wharf > 00.13 miles before Hau Street	0.00	3.09	3	Urban NHS			3.09			
19	Hawaii Belt Road : 0.13 miles before Hau Street > Mud Lane (Route 19)	3.09	51.82	3	Rural NHS			48.73			
19	Hawaii Belt Road/Mamalahoa Highway/Lindsey Road/Kawaihae Road/Queen Kaahumanu Highway : Mud Lane (Route 19) > Palani Road (Route 190)	51.82	99.59	3	Urban NHS			47.77			
121	North Kulani Road : Volcano Road (Route 11) > Huina Road	0.00	1.60	6	Rural						1.60
122	Wright Road : Kilinoe Road > Volcano Road (Route 11)	0.00	1.22	6	Rural						1.22
130	Keaau-Paho Road : Volcano Road (Route 11) > Paho-Kapoho Road (Route 132)	0.00	12.14	4	Urban				12.14		
130	Paho-Kalapana Road/Kaimu-Chain of Craters Road : Paho-Kapoho Road (Route 132) > end of route (0.83 miles past Royal Palm Drive)	12.14	25.32	5	Rural					13.18	
132	Paho-Kapoho Road : Paho-Keeau Road (Route 130) > Kaimu-Kapoho Road	0.00	7.73	5	Rural					7.73	
134	Paho Village Road : Keaau-Paho Road (Route 130) > Paho Kalapana-Road [through Paho town] (Route 130)	0.00	1.49	5	Rural					1.49	
135	Pohoiki Road : Paho-Kapoho Road (Route 132) > Kalapana Road-Kapoho Road (Route 137)	0.00	4.56	6	Rural						4.56
137	Kapoho Kalapana Road : Paho-Kapoho Road (Route 132) > Paho-Kalapana Road (Route 130)	0.00	15.06	6	Rural						15.06
138	Kahakai Boulevard : Keaau-Paho Road (Route 130) > Papio Street	0.00	5.90	5	Urban					5.90	
139	Old Keaau-Paho Road : Volcano Road (Route 11) > Keaau-Paho Road (Route 130)	0.00	1.19	5	Rural					1.19	
145	Kamani Street : Pikake Street > Mamalahoa Highway (Route 11)	0.00	0.50	6	Rural						0.50
155	Kamaoa Road : South Point Access Road (Route 150) > Mamalahoa Highway (Route 11)	0.00	3.98	6	Rural						3.98
160	Ke Ala O Keawe Road : Mamalahoa Highway (Route 11) > end of route	0.00	3.82	5	Rural					3.82	
161	Napoopoo Road : Puuhonua Road > Mamalahoa Highway (Route 11)	0.00	4.40	5	Urban					4.40	
163	Ke Ala O Keawe Road (City of Refuge spur) : Ke Ala O Keawe Road > parking lot entrance	0.00	0.13	5	Rural					0.13	
164	Halekii Street : Mamao Street > Mamalahoa Highway (Route 11)	0.00	0.26	5	Urban					0.26	

Highway Functional Classification: Island of Hawaii

ROUTE	ROADWAY NAME AND EXTENT	BEGIN MP	END MP	HPMS Code	RURAL/ URBAN/ NHS	MILEAGE BY FUNCTIONAL CLASSIFICATION					
						INTERSTATE	FREEWAY & EXPRESSWAY	ARTERIAL		COLLECTOR	
								PRINCIPAL	MINOR	MAJOR	MINOR
180	Haawina Street/Mamalahoa Highway : Kuakini Highway (Route 11) > Mamalahoa Highway (Route 190)	0.00	9.14	4	Urban				9.14		
182	Lako Street : Kuakini Highway (Route 11) > end of route (future connection to Alii Drive)	0.00	0.49	6	Urban						0.49
184	Sunset Drive : Marlin Road > Kuakini Highway (Route 11)	0.00	0.32	6	Urban						0.32
185	Kamehameha III Road : Kuakini Highway (Route 11) > Manukai Street	0.00	1.76	5	Urban					1.76	
186	Palani Road/ Alii Drive: Kuakini Highway (Route 11) > Mamalahoa Bypass	0.00	7.06	5	Urban					7.06	
187	Walua Road : Akoni Drive > Kuakini Highway (Route 11)	0.00	0.60	6	Rural						0.60
188	Hualalai Road : Alii Drive (Route 186) > Queen Kaahumanu Highway (Route 11)	0.00	1.30	5	Urban					1.30	
189	Kaleiopapa Road : Ehukai Street > Alii Drive (Route 186)	0.00	0.25	6	Urban						0.25
190	Mamalahoa Highway : Lindsey Road (Route 19) > 0.31 miles after Waimea-Kohala Airport Road	0.00	2.02	4	Urban				2.02		
190	Mamalahoa Highway : 0.31 miles after Waimea-Kohala Airport Road > Makalei Golf Club	2.02	31.31	4	Rural				29.29		
190	Mamalahoa Highway : Makalei Golf Club > 0.06 Miles after Mamalahoa Highway (Route 180)	31.31	35.30	4	Urban				3.99		
190	Palani Road : 0.06 Miles after Mamalahoa Highway (Route 180) > Kuakini Highway (Route 1100)	35.30	38.99	5	Urban					3.69	
191	Waikoloa Road : Mamalahoa Highway (Route 190) > Queen Kaahumanu Highway (Route 19)	0.00	11.93	4	Urban				11.93		
192	Hina Lani Street : Queen Kaahumanu Highway (Route 19) > Mamalahoa Highway (Route 190)	0.00	3.60	5	Urban					3.60	
196	Paniolo Avenue : Waikoloa Road (Route 191) > Hooke Street	0.00	1.64	5	Urban					1.64	
197	Kealakehe Parkway : Queen Kaahumanu Highway (Route 19) > Palani Road (Route 190)	0.00	3.10	4	Urban				3.10		
198	Kaiminani Drive : Mamalahoa Highway (Route 190) > Queen Kaahumanu Highway (Route 19)	0.00	3.62	5	Urban					3.62	
200	Saddle Road : Hilo urban boundary (0.16 miles before Ua Nahele St) > Queen Kaahumanu Highway (Route 19)	0.00	54.00	4	Rural				54.00		
220	Hononu Road/Old Mamalahoa Highway/Akaka Falls Road: Hawaii Belt Road (Route 19) > Akaka Falls entrance	0.00	3.77	6	Rural						3.77
222	Old Mamalahoa Highway : Hawaii Belt Road (NW junction) (Route 19) > Hawaii Belt Road (SE junction) (Route 19)	0.00	0.80	6	Rural						0.80
227	Lehua Street/Plumeria Street : Mamane Street (Route 240) > Hawaii Belt Road (Route 19)	0.00	0.66	5	Rural					0.66	
228	Pikake Street : Ohia Street > Hawaii Belt Road (Route 19)	0.00	0.41	6	Rural						0.41

Highway Functional Classification: Island of Hawaii

ROUTE	ROADWAY NAME AND EXTENT	BEGIN MP	END MP	HPMS Code	RURAL/ URBAN/ NHS	MILEAGE BY FUNCTIONAL CLASSIFICATION					
						INTERSTATE	FREEWAY & EXPRESSWAY	ARTERIAL		COLLECTOR	
								PRINCIPAL	MINOR	MAJOR	MINOR
240	Honokaa-Waipio Road/Mamane Street : Hawaii Belt Road (Route 19) > Lehua Street/Plumeria Street (Route 227)	0.00	1.50	5	Rural					1.50	
240	Honokaa-Waipio Road : Lehua Street/Plumeria Street (Route 227) > Waipio Valley lookout	1.50	9.62	6	Rural						8.12
250	Kohala Mountain Road : Kawaihae Road (Route 19) > beginning of rural boundary	0.00	1.77	5	Urban					1.77	
250	Kohala Mountain Road/Hawi Road : beginning of rural boundary > Akoni Pule Highway (Route 270)	1.77	19.28	5	Rural					17.51	
270	Kawaihae Road : Queen Kaahumanu Highway (Route 19) > Kawaihae Bridge (#001000270300326)	0.00	1.36	3	Urban NHS			1.36			
270	Kawaihae Road/Akoni Pule Highway : Kawaihae Bridge (#001000270300326) > Maluokalani Street	1.36	2.44	4	Urban NHS				1.08		
270	Akoni Pule Highway : Maluokalani Street > Niulii Bridge (#001002700502390)	2.44	25.39	4	Rural				22.95		
270	Akoni Pule Highway : Niulii Bridge (#001002700502390) > Pololu Valley entrance	25.39	27.02	5	Rural					1.63	
272	Kynnersley Road : Kohala Mountain Road (Route 250) > Akoni Pule Highway (Route 270)	0.00	2.32	6	Rural						2.32
1100	Kuakini Highway : Kaiwi Street (Route 1835) > Queen Kaahumanu Highway (Route 11)	0.00	3.08	5	Urban					3.08	
1110	Alii Highway/Parkway : Alii Drive (Route 186) > Queen Kaahumanu Highway (Route 11)	0.00	4.44	5	Urban					4.44	
1370	Kalaniana'ole Avenue : Kuhio Street > Pua Avenue	0.00	0.48	3	Urban NHS			0.48			
1370	Kalaniana'ole Avenue : Pua Avenue > Lelewi Street	0.48	2.98	5	Urban					2.50	
1810	Nani Kailua Drive : Hienaloli Road > Queen Kaahumanu Highway (Route 11)	0.00	0.83	6	Urban						0.83
1830	Henry Street : Kuakini Highway (Route 1100) > Queen Kaahumanu Highway (Route 11)	0.00	0.35	5	Urban					0.35	
1835	Kaiwi Street : Queen Kaahumanu Highway (Route 19) > Kuakini Highway (Route 1100)	0.00	0.52	5	Urban					0.52	
1880	Ane Keohokalole Highway : Palani Road (Route 190) > Kaiminani Drive (Route 198)	0.00	5.65	5	Urban					5.65	
1905	Kealakaa Street : Uluaoa Street > Palani Road (Route 190)	0.00	0.54	6	Urban						0.54
1910	Kamehameha Avenue : Waianuenue Avenue (Route 1950) > Pauahi Street (Route 19)	0.00	0.66	4	Urban				0.66		
1920	Kilauea Avenue : Ponahawai Street (Route 2730)> Kanoelehua Avenue (Route 11)	0.00	4.08	4	Urban				4.08		
1921	Kilauea Avenue : Ponahawai Street (Route 2730) > Keawe Street	0.00	0.07	4	Urban				0.07		
1921	Keawe Street : Kilauea Avenue (Route 1921) > Waianuenue Avenue (Route 1950)	0.07	0.35	6	Urban						0.28

Highway Functional Classification: Island of Hawaii

ROUTE	ROADWAY NAME AND EXTENT	BEGIN MP	END MP	HPMS Code	RURAL/ URBAN/ NHS	MILEAGE BY FUNCTIONAL CLASSIFICATION					
						INTERSTATE	FREEWAY & EXPRESSWAY	ARTERIAL		COLLECTOR	
								PRINCIPAL	MINOR	MAJOR	MINOR
1925	Pauahi Street : Kamehameha Avenue (Route 19) > Kilauea Avenue (Route 1920)	0.00	0.30	5	Urban					0.30	
1930	Kinoole Street : Wailuku Drive (Route 2860) > Haihai Street (Route 2740)	0.00	3.91	4	Urban				3.91		
1940	Komohana Street : Waianuenue Avenue (Route 1950) > Ainaola Drive (Route 2750)	0.00	3.00	5	Urban					3.00	
1950	Waianuenue Avenue/Kaumana Drive/Saddle Road : Kamehameha Avenue (Route 1910) > Hilo urban boundary (0.16 miles before Ua Nahele St)	0.00	7.84	5	Urban					7.84	
1960	Railroad Avenue : Leilani Street > Kahaopea Street	0.00	1.35	6	Urban						1.35
1970	Kamehameha Avenue/Silva Street : Railroad Avenue > Kalaniana'ole Street (Route 19)	0.00	0.93	6	Urban						0.93
2000	Puainako Street : Railroad Avenue (Route 1960) > Komohana Street (Route 1940)	0.00	2.18	5	Urban					2.18	
2000	Komohana Street/Puainako Street Extension: Puainako Street (Route 2000) > Kaumana Drive (Route 1950)	2.18	6.87	6	Urban						4.69
2460	Kamamalu Street : Mamalahoa Highway (Route 19) > Hiiaka Street	0.00	0.68	6	Urban						0.68
2470	Lindsey Road : Hokuula Road > Kawaihae Road (Route 19)	0.00	0.29	6	Urban						0.29
2710	Stainback Highway : Hilo south urban boundary > Volcano Road (Route 11)	0.00	1.49	6	Urban						1.49
2720	Waianuenue Avenue : Kaumana Drive (Route 1950) > Akolea Road (Route 2850)	0.00	2.11	5	Urban					2.11	
2730	Ponahawai Street : Komohana Street (Route 1940) > Kamehameha Avenue (Route 1910)	0.00	1.11	6	Urban						1.11
2740	Haihai Street : Kilauea Avenue (Route 1920) > Kupulau Road	0.00	2.55	5	Urban					2.55	
2750	Ainaola Drive : Kawaihina Street (Route 2760)> Kupulau Road	0.00	2.15	5	Urban					2.15	
2760	Kawaihina Street/Kupulau Place : Kanoelehua Avenue (Route 11) > Kupulau Road	0.00	2.70	5	Urban					2.70	
2760	Kupulau Road: Kupulau Place (Route 2760) > Ainaola Drive (Route 2750)	2.70	3.90	6	Urban						1.20
2770	Iwalani Street : Haihai Street (Route 2740)> Puainako Street (Route 2000)	0.00	1.40	6	Urban						1.40
2770	Kawili Street/Manono Street : Puainako Street (Route 2000) > Kamehameha Avenue (Route 19)	1.40	3.75	5	Urban					2.35	
2790	Mohouli Street : Kilauea Avenue (Route 1920) > Komohana Street (Route 1940)	0.00	1.14	5	Urban					1.14	
2810	Kekuana'oa Street : Kanoelehua Avenue (Route 11) > Kilauea Avenue (Route 1920)	0.00	0.81	5	Urban					0.81	
2820	Lanikaula Street/Kumukoa Street : Kanoelehua Avenue (Route 11) > Mohouli Street (Route 2790)	0.00	1.81	5	Urban					1.81	

Highway Functional Classification: Island of Hawaii

ROUTE	ROADWAY NAME AND EXTENT	BEGIN MP	END MP	HPMS Code	RURAL/ URBAN/ NHS	MILEAGE BY FUNCTIONAL CLASSIFICATION					
						INTERSTATE	FREEWAY & EXPRESSWAY	ARTERIAL		COLLECTOR	
								PRINCIPAL	MINOR	MAJOR	MINOR
2840	Ainako Avenue/Lahi Street : Kaumana Drive (Route 1950) > Waianuenue Avenue (Route 2720)	0.00	1.50	6	Urban						1.50
2850	Akolea Road : Wainuenue Avenue (Route 2720) > Kaumana Drive (Route 1950)	0.00	1.88	6	Urban						1.88
2860	Wainaku Avenue/Wailuku Drive : Mamalahoa Highway (Route 19) > Kinoole Street (Route 1930)	0.00	1.80	5	Urban					1.80	



Appendix B

Plan and Policy Review

Statewide Federal-Aid Highways 2035 Transportation Plan and Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai

Plan, Policy, and Program Review (Federal and Statewide)

TO: State of Hawaii Department of Transportation (HDOT)
FROM: CH2M HILL
DATE: February 11, 2013

Introduction

The planning team reviewed federal and state policies, plans, and programs relevant to development of the Statewide Federal-Aid Highways 2035 Transportation Plan (Plan). These reviews captured major components related to and aligned with the federal planning factors defined in the United States Code (USC) and ensured the Plan addressed modes and users comprehensively.

In addition to federal and state guidance, regional and local plans and policies were also reviewed for the districts of Maui, Hawaii, and Kauai as part of the development of the Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai. Along with plan and policy reviews for the District of Oahu, these regional reviews were intended to ensure the statewide Plan considered regional policies. This comprehensive approach emphasized addressing community needs and values.

The following summary of federal and state plans, policies, and programs was an important first step to ensure that the Statewide Federal-Aid Highways 2035 Transportation Plan:

- Built effectively on previously adopted plans, policies, and programs
- Complied with federal and state requirements, and considered local policies
- Had guidance and structure for the development of potential solutions

The plan, policy, and program summaries helped to shape the Plan goals and the definition of potential solutions.

Federal Plans, Policies, and Programs

Federal transportation policy and planning programs generally provide direction and funding mechanisms for statewide or regional plans or programs. Federal transportation planning policies are intentionally broad to allow states and regions the flexibility to tailor policy implementation that works for their geography and population.

The following plans, policies and programs were examined:

- Moving Ahead for Progress in the 21st Century (MAP-21), Federal Transportation Bill
- USC, Title 23, *Highways*, Section 134, *Metropolitan Transportation Planning*
- USC, Title 23, *Highways*, Section 135, *Statewide Transportation Planning*
- Code of Federal Regulations (CFR), Title 23, *Highways*, Part 450, Subpart B, *Statewide Transportation Planning*
- *National Response Framework*, United States (US) Department of Homeland Security
- *Bicycle Resolutions*, 110th Congress US Conference of Mayors

Moving Ahead for Progress in the 21st Century

Purpose and Content

MAP-21 is the current federal transportation legislation, adopted in July 2012. It is a long-term highway authorization act and guides transportation policy at the federal level. The act includes funding for fiscal years 2013 and 2014, and outlines national goals and transportation performance targets. MAP-21 also condenses and streamlines transportation funding programs from the previous 90 into roughly 30. The act builds on and refines many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

MAP-21 represents a transition to a performance and outcome-based state highway program. Performance measures in MAP-21 provide guidance for states to most efficiently invest federal funds. These measures refocus investments to align with national transportation goals, increasing the accountability and transparency of the federal-aid highway program and improving project decision-making.

States shall establish performance targets in coordination with metropolitan planning organizations (MPOs) and public transit operators (in areas not represented by MPOs). States may also develop targets specific to urbanized areas or rural areas.

State and metropolitan plans, including long-range plans, must describe these performance measures and targets used to assess system performance. Plans must also include how program and project selection will help achieve targets, once they are set (expected in fall 2014) by the United States Department of Transportation. MAP-21 includes the following national performance goals for system management:

- **Safety** – significantly reduce traffic fatalities and serious injuries on all public roads
- **Infrastructure Condition** – maintain highway infrastructure assets in state of good repair
- **Congestion Reduction** – significantly reduce congestion on the National Highway System
- **System Reliability** – improve the efficiency of the surface transportation system
- **Freight Movement and Economic Vitality** – improve freight networks, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- **Environmental Sustainability** – enhance transportation system performance while protecting and enhancing the natural environment
- **Reduce Project Delivery Delays** – reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

MAP-21 changes the way program funding is distributed to individual states. Previously, core highway programs were able to distribute funds to states using different individual formulas. With new legislation, formulas have been eliminated and a lump sum has been authorized to fund the core programs including the National Highway Performance

Program, the Surface Transportation Program, the Highway Safety Improvement Program including Rail-Highway Crossings, Congestion Mitigation and Air Quality Improvement Program, and Metropolitan Planning.

A lump sum is then distributed to states proportionally (based on 2012 distributions received under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users). States are able to distribute funds internally (using MAP-21 guidance on the percentage distribution) to core programs. States also have the flexibility to transfer up to 50 percent of funds from one program to another (exceptions include no transfers of Metropolitan Planning funds or funds allocated to areas based on population) to make progress towards achieving performance target goals.

Findings Related to the Plan

MAP-21 makes modifications to the statewide long range planning process. Related to the shift to performance and outcome-based planning:

- The statewide planning process will establish and use a performance-based approach to transportation decision making to support the national goals.
- Each state will establish performance targets that address the performance measures, where applicable, to use in tracking progress toward attainment of critical outcomes for the State.
- The state will select performance targets in coordination with the relevant MPOs to ensure consistency, to the maximum extent practicable.
- In urbanized areas not represented by an MPO, the state will select performance targets in coordination with the providers of public transportation, to the maximum extent practicable.
- States will integrate into the statewide transportation planning process other performance-based plans and processes.
- The Secretary of Transportation shall establish criteria for the evaluation of the new performance-based planning processes.

Related to statewide long-range plans:

- The long-range plan should include a description of the performance measures and targets used in assessing system performance.
- The long-range plan should include a system performance report and subsequent updates evaluating the condition and performance of the transportation system in relation to the performance targets.

The Statewide Federal-Aid Highways 2035 Transportation Plan will support and be aligned with the new performance-based guidance outlined in MAP-21.

The Statewide Federal-Aid Highways 2035 Transportation Plan is framed around eight federal planning factors: Environment and Sustainability, Modal Integration, System Preservation, Security, Economic Vitality, System Efficiency Management and Operations, Transportation Access Mobility, and Safety. These planning factors are related to and can be aligned with the new national performance goals established by MAP-21.

Alignment with the Planning Factors

MAP-21 is in alignment with the federal planning factors as shown in the table below. Certain national goals (such as Environmental Sustainability and Safety) can be aligned directly with existing planning factors, while the goal of System Reliability can be aligned with multiple planning factors.

The national goal of System Reliability aims to improve the general efficiency of the surface transportation system. Elements of the System Preservation, System Efficiency Management and Operations, and even Security planning factors would contribute to achievement of this national goal.

Federal Planning Factors	MAP-21 Performance Goals
Environment and Sustainability - Develop solutions that meet transportation needs without compromising the ability of future generations to meet their own needs; develop solutions that promote energy conservation, improve the quality of life, and address climate change.	Environmental Sustainability – enhance transportation system performance while protecting and enhancing the environment
Modal Integration - Expand transportation options and make connections between modes such as public transit, automobile, bicycle, and pedestrian.	
System Preservation - Maintain a regular schedule of rehabilitation, reconstruction, and replacement to keep the multimodal system operating safely and efficiently.	Infrastructure Condition – maintain highway infrastructure assets in state of good repair System Reliability – Improve the efficiency of the surface transportation system
Security - Ensure the secure operation of the land transportation system by involving multiple agencies to work together to achieve common goals of risk management, incident detection, response, clearance, and preparation for and recovery from disasters.	System Reliability – Improve the efficiency of the surface transportation system
Economic Vitality - Support industry, tourism, cultural, and recreational opportunities by reducing travel time, operating costs, travel distance, crashes and logistics inefficiencies.	Freight Movement and Economic Vitality – Improve freight networks, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
System Efficiency Management and Operations - Optimize the performance of existing infrastructure; provide reliability and predictability within the transportation system and between modal choices.	Congestion Reduction – reduce congestion on the National Highway System System Reliability – Improve the efficiency of the surface transportation system
Transportation Access Mobility - Enhance both infrastructure and services to improve mobility, consistency, and equity.	
Safety - Increase traveler safety through engineering, education, and enforcement programs and campaigns, and improve regulations and research efforts.	Safety – reduce fatalities and serious injuries on all public roads

USC Title 23, Section 134, *Metropolitan Transportation Planning*

Purpose and Content

USC Section 134 defines the designation, authority and responsibilities of MPOs. The general requirements of an MPO include development and updates of long-range plans and transportation improvement programs within their defined boundaries as follows:

Long-range Plans

- Shall provide for consideration of projects and strategies that will address the planning factors.
- Shall provide for the development, integrated management and operation of transportation systems.
- Shall provide for consideration of all modes of transportation and shall be continuing, cooperative, and comprehensive to the degree appropriate.
- The plan and plan process shall include identification of multi modal transportation facilities, mitigation activities, financial plan, operational and management strategies, capital investment and other strategies, transportation and transit enhancement activities, consultation and participation by interested parties, methods and selection of projects.

Transportation Improvement Programs

- Shall be developed in cooperation with the state and any affected public transportation operator and shall provide opportunities for interested parties to participate in the development.
- Shall provide funding estimates that are reasonable to support implementation.
- Shall include a priority list of proposed federally supported projects and strategies.
- Shall include a financial plan.
- Shall include descriptions of each project.
- Shall have consistency with long-range transportation plans.

Metropolitan transportation planning policy as defined by Section 134 encompasses the following goals:

- Encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and between states and urbanized areas, while minimizing transportation related fuel consumption and air pollution through metropolitan and statewide transportation planning processes.
- Encourage the continued improvement and evolution of the metropolitan and statewide transportation planning processes by metropolitan planning organizations, state departments of transportation and public transit operators as guided by the planning factors.

Findings Related to the Plan

The Statewide Federal-Aid Highways 2035 Transportation Plan will be developed in alignment with the federal regulations outlined in Section 134 of the USC and will coordinate statewide efforts with the Oahu MPO’s long-range planning efforts and TIP development.

Planning Factors

USC Section 134 defines planning factors that are the framework for the long-range planning goals.

Planning Factors
Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
Increase the safety of the transportation system for motorized and nonmotorized users.
Increase the security of the transportation system for motorized and nonmotorized users.
Increase the accessibility and mobility of people and for freight.
Protect and enhance the environment , promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
Promote efficient system management and operation.
Emphasize the preservation of the existing transportation system.

USC Title 23, Section 135, *Statewide Transportation Planning*

Purpose and Content

USC Section 135 defines the responsibilities of the state and their requirements for statewide transportation planning. The general requirements of the state include development of a statewide transportation plan and statewide transportation improvement program for areas subject to USC Section 135 and nonmetropolitan areas within the state.

Statewide Long-range Plans

- Shall provide for the development, integrated management and operation of transportation systems.
- Shall consider all modes of transportation and shall be continuing, cooperative, and comprehensive to the degree appropriate.
- Shall be coordinated with plans and transportation improvement programs of MPOs as well as stakeholders and agencies with jurisdictions in nonmetropolitan areas.
- Shall provide for consideration of projects, strategies and services that will address the planning factors.
- The plan and plan process shall include a minimum 20-year forecast period, mitigation activities, financial plan, operational and management strategies, capital investment and other strategies, transportation enhancement activities, consultation, and participation by interested parties and methods.
- The statewide transportation plan should include capital, operations and management strategies, investments, procedures and other measures to ensure the preservation and most efficient use of the existing transportation system.

Statewide Transportation Improvement Programs

- Shall be developed in cooperation with the MPOs as well as stakeholders and agencies with jurisdictions in non-metropolitan areas and shall provide opportunities for interested parties to participate in the development.
- Shall include federally supported surface transportation expenditures.
- Shall include regionally significant and other projects.
- Shall have consistency with the statewide and MPO long-range transportation plans.
- Shall include projects only if full funding can reasonably be anticipated.
- Shall include a financial plan.

Findings Related to the Plan

The Plan will be developed in alignment with the federal regulations outlined in USC Section 135 and will coordinate statewide efforts with the Oahu MPO's long-range planning efforts and the counties.

Planning Factors

USC Section 135 defines planning factors that shall be the framework for the long-range planning goals:

Planning Factors
Support the economic vitality of the US, states, nonmetropolitan areas, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.
Increase the safety of the transportation system for motorized and nonmotorized users.
Increase the security of the transportation system for motorized and nonmotorized users.
Increase the accessibility and mobility of people and for freight.
Protect and enhance the environment , promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
Promote efficient system management and operation.
Emphasize the preservation of the existing transportation system.

23 CFR 450, *Planning Assistance and Standards*

Purpose and Content

The purpose of 23 CFR 450 is to define the implementation of USC 134 and 135.

Subpart B relates to the statewide transportation planning process:

- Shall, at a minimum, explicitly address noted factors, including transportation management system efficiencies and needs, energy use goals, water pollution/coastal zone requirements, intermodal transportation facilities, sub-area connectivity, recreation travel needs, congestion management, socioeconomic consistency and effects, transportation system preservation, financing mechanisms, lifecycle costs and investment strategies.
- Shall be done in cooperation with participating organizations (agencies and transportation operators), including coordination of: data and analyses, programs and priorities, multi-jurisdictional intermodal connections and land use/transportation planning and public involvement.
- Public involvement shall be explicit, proactive, and provide for early and continuous involvement. Periodic review of the effectiveness of the public involvement process shall be performed and necessary revisions made.
- The Statewide Transportation Plan shall be intermodal, cover at least a 20-year period, reference applicable planning studies/policies and be coordinated with MPOs, transportation agencies, operators, stakeholders and the public.
- The Statewide Transportation Improvement Program (STIP) shall include a list of priority projects for 3 years (MPO transportation improvement program priorities remain intact), projects beyond the 3 years will be considered informational only. The STIP shall be consistent with the statewide transportation plan. The STIP must be financially constrained by year and must be approved every 2 years.

Findings Related to the Plan

The content of and process of developing the Statewide Federal-Aid Highways 2035 Transportation Plan will be implemented consistently with the federal regulations outlined in 23 CFR 450. A comprehensive approach and outreach effort will be performed to ensure alignment with these regulations.

Alignment with the Planning Factors

23 CFR 450 defines the implementation of the statewide and metropolitan planning processes which considers and addresses all of the planning factors.

National Response Framework, US Department of Homeland Security, January 2008

Purpose and Content

The National Response Framework (NRF) is a guide that details how the nation conducts all-hazards response at various scales of incidents. This document establishes a comprehensive, national, all-hazards approach to domestic incident response. The Framework identifies the key response principles, as well as the roles and structures that organize national response. It describes how communities, and various government and nongovernmental partners apply these principles for a coordinated, effective national response. In addition, it describes special circumstances where the federal government exercises a larger role, including incidents where federal interests are involved and catastrophic incidents where a state would require significant support. It lays the groundwork for first responders, decision-makers, and supporting entities to provide a unified national response.

Findings Related to the Plan

To strengthen response actions, the NRF describes three key phases: prepare, respond, and recover. Transportation is a vital component for all phases. Considerations include planning for transportation needs of incidents, especially interdependencies between key locations (that is, operational headquarters, emergency evacuation shelters, hospitals), and the ability to mobilize, activate and demobilize resources.

Alignment with the Planning Factors

The Security planning factor is in alignment with the overall framework of the NRF. Specifically, the alignment occurs with the establishment of processes, roles and responsibilities between multiple agencies working together to achieve transportation security, through preparation, response and recovery.

Bicycle Resolutions, 110th Congress, US Conference of Mayors, June 2008

Purpose and Content

The Congressional Resolution 305 and the US Conference of Mayors Resolutions in 2008 recognize that increased and safe bicycle use for transportation and recreation is in the national interest. They also support policies and programs that promote and protect bicycle use, and encourage the Department of Transportation and the Mayor's offices to provide leadership and coordination to make communities bicycle-friendly.

Findings Related to the Plan

The Congressional Resolution 305 support policies that:

- Establish national target levels for increased bicycle use, reduce the number of motor vehicle-miles traveled, improve bicycle safety to be achieved within a specific timeframe, and collect data needed to monitor progress.
- Increase intermodal travel between public transportation and bicycles.
- Provide incentives for state and local governments to adopt and implement complete street policies designed to accommodate all users, including motorists, pedestrians, bicyclists, transit riders, and people of all ages and abilities.
- Encourage bicycle use in communities where significant segments of the population do not drive and where short trips are most common.
- Expand funding for core federal transportation programs that support nonmotorized infrastructure, education, and encouragement programs by:
 - Safeguarding existing funding sources for nonmotorized transportation from inequitable treatment in the federal transportation funds rescission process;
 - Supporting funding for core federal transportation programs that support nonmotorized travel, including transportation enhancements, safe routes to school, and recreational trails; and
 - Ensuring that highway safety improvement program funds are spent in proportion to the percentage of bicyclist and pedestrian fatalities in each state.
- Facilitate the development of a coordinated system of US bicycle routes across the country that cross state borders and connect metropolitan regions.
- Create bicycle-friendly federal land protection legislation, such as national recreation areas, to encourage regulations and management practices for mountain biking as an environmentally friendly nonmotorized use of natural surface trails.
- Provide flexibility in federal transportation law that would speed up the delivery of nonmotorized infrastructure without sacrificing necessary environmental protections.
- Provide federal tax or funding incentives to:

- States that adopt motor vehicle laws that protect the rights of bicyclists to share the road.
- Businesses that expand bicycle-friendly programs for their employees.
- The health care industry to develop more member discount programs that target increased physical activity such as bicycling and walking.
- Provide bicycle commuters the transportation fringe benefits currently provided to people who commute by car or mass transit.
- Build upon the Green the Capitol Initiative as a model, create and provide an environmentally sustainable and healthy working environment for employees that includes the promotion of bicycling as a transportation alternative.

In addition to the policies supported by the Congress, the US Conference of Mayors also encourages the following actions to be taken:

- Even absent federal incentives, governors and state-level leadership should embrace Complete Streets policies that acknowledge the contributions of bicycles as a means to reduce vehicle miles by integrating bicycle use into standard street design;
- Calls on all mayors that sign onto the Climate Protection Agreement to develop and implement action plans to incorporate bicycling programs and policies as a key component in reducing greenhouse gas emissions 80 percent by 2050.
- Every mayor strives to make their city a bicycle-friendly community.

Alignment with the Planning Factors

The resolutions align with the Environment planning factor through encouraging bicycle use, which promotes energy conservation and improves the quality of life. They also align with the Modal Integration planning factor by supporting increasing intermodal travel between public transportation and bicycles. In addition, the resolutions align with the Safety planning factor by improving safety conditions for bicyclists and monitoring the progress through data collection.

Statewide Plans and Policies

Statewide transportation policy and planning documents primarily address statewide transportation networks, and some cover all modes. Statewide plans and policies provide a general policy framework for transportation planning and direction for project and program implementation (including guidelines and standards) for Hawaii state roadway facilities. These plans and policies can also serve as examples for counties to develop their own policies, guidelines and standards.

The following plans and policies were examined:

- HRS 279A Statewide Transportation Planning
- *Hawaii Statewide Transportation Plan* (2011)
- Disability and Communication Access Board Policy
- *Bike Plan Hawaii* (2003)
- *Statewide Pedestrian Master Plan* (2013)
- *Complete Streets Task Force* (2010)
- *Federal-Aid and State Highway Update: System Identification and Functional Classification* (2013)
- *Hawaii Strategic Highway Safety Plan 2007-2012*
- *State of Hawaii Multi-Hazard Mitigation Plan* (2007)
- *Coordinated Public Transit Human Services Transportation Plan* (2008)
- *State Comprehensive Outdoor Recreation Plan 2008 Update*
- National Wildlife Refuges
- National Parks
- Department of Health, Active Living Workshops
- *Hawaii 2050 Sustainability Plan* (2008)
- *Hawaii Tourism Authority Strategic Plan: 2010-2012*
- Coastal Storms Program
- Coastal Zone Management Program
- Hawaii Department of Transportation Statewide Transportation Improvement Program (Current Update, Fiscal Year 2011-2014 +2)
- *Report on the State of Physical Infrastructure in Hawaii* (July 2010)

HRS 279A, Statewide Transportation Planning

Purpose and Content

HRS 279A provides a means of coordinating the state's existing responsibilities for inter-island and major highway transportation planning/development with counties' responsibilities for intra-island surface transportation system planning/development, in order to facilitate the ultimate production of a statewide transportation plan which optimizes intra-island and inter-island system integration.

The statute establishes a comprehensive, multimodal statewide transportation planning process that involves all levels of government in a cooperative process to develop coordinated transportation plans.

The statute also establishes a Statewide Transportation Council and defines its roles and responsibilities.

Findings Related to the Plan

The statute requires the statewide transportation plan to develop a balanced, multimodal statewide transportation system that serves clearly identified social, economic and environmental objectives. The plan shall include, but not be limited to national system of interstate and defense highways and highways within the state highway system, airports, harbors, mass transit systems and county roads, with particular attention made to the interfacing of the various modes of transportation. It also requires that a financial plan be included, identifying both state and county system elements, noting the level of state financial assistance for the county elements.

Briefings will be given to the Statewide Transportation Council at defined points within the project development process.

Alignment with the Planning Factors

The HRS 279A requirements support enhancing the Integration and Connectivity of the transportation system between various travel modes for people and freight.

It also stresses a balanced system, in corresponding to support of the Environment and Economic Vitality planning factors.

Hawaii Statewide Transportation Plan, HDOT, May 2011

Purpose and Content

The *Hawaii Statewide Transportation Plan* (HSTP) links broad policy goals with specific action items. It provides the foundation that connects these action items with the transportation planning done at the statewide, regional and local levels. The HSTP is *not* a listing of specific transportation projects, but rather a policy document. Its main focus is to provide guidance to system level and master plans of the three primary modes of transportation used in Hawaii (the air, water, and land systems), as well as the nonmotorized modes and inter-modal connections. The plan provides the context for the development of transportation programs that, when implemented, will help achieve one or more of Hawaii’s transportation goals. It identifies transportation directions and the range of key elements to be considered in the development, management, and operation of Hawaii’s transportation systems. The primary purposes and utility of the HSTP are:

- Establish a framework for the development, integrated management and operation of Hawaii’s multimodal transportation systems, programs, and facilities.
- Provide a foundation and identify the parameters within which the search for solutions can begin.

Findings Related to the Plan

The policy direction set by the HSTP requires alignment of the goals, objectives, programs and ultimately potential solutions of the plan. The plan needs to be consistent with the statewide policy level transportation decisions. Consistency with the HSTP will best achieve the transportation system’s overall mission. The HSTP goals and objectives (May 2011) related to land transportation are listed below.

Goals	Objectives
<p>GOAL 1: Mobility and Accessibility</p> <p>Create and manage an integrated multimodal transportation system that provides mobility and accessibility for people and goods.</p>	<p>Objective 1:</p> <p>Preserve and maintain the existing air, water and land transportation systems, including motorized and nonmotorized modes and measures in good condition or better, and give comparable consideration to funding preservation capital projects as is given to expansion projects.</p> <p>Objective 2:</p> <p>Ensure the provision of essential and critical air, land, and water transportation operations and services for all communities throughout the islands.</p> <p>Objective 3:</p> <p>Ensure multimodal and inter-modal connections for passengers and commodities on the air, land and water systems; and formulate a program of multimodal and inter-modal projects, including bicycle and walking options.</p> <p>Objective 4:</p> <p>Address the special needs of Hawaii’s underserved populations, including the elderly, disabled and Title VI/Environmental Justice (T6/EJ) populations.</p> <p>Objective 5:</p> <p>Reduce congestion in the air, water and land transportation systems.</p>

Goals	Objectives
<p>GOAL 2: Safety</p> <p>Enhance the safety of the air, land and water transportation systems.</p>	<p>Objective 1:</p> <p>Enhance system and user safety at transportation facilities both motorized and nonmotorized, with the use of proper equipment, technology and physical hazard reduction; and implement priority safety projects for each mode.</p> <p>Objective 2:</p> <p>Support and collaborate with all levels of government to identify transportation routes and protocols for the safe movement of hazardous materials.</p> <p>Objective 3:</p> <p>Continuously conduct assessment, preparedness, and emergency response for natural disasters as part of all planning efforts.</p> <p>Objective 4:</p> <p>Use and consider a full range of transportation design techniques to improve personal safety for all travelers.</p>
<p>GOAL 3: Security</p> <p>Ensure the secure operation and use of the air, land and water transportation systems.</p>	<p>Objective 1:</p> <p>Minimize risks of disruption of transportation to, from and within Hawaii due to terrorism and other human security threats and events, as well as threats and events from natural causes.</p> <p>Objective 2:</p> <p>Work with federal, state, and county agencies as well as tenants to conduct vulnerability and risk assessments.</p> <p>Objective 3:</p> <p>Implement security policies and strategies to minimize risks and threats of disruption of or damage to the transportation systems while maintaining the intended function of the system.</p> <p>Objective 4:</p> <p>Provide continuous monitoring of critical infrastructure and communications systems to provide for appropriate emergency response capability.</p> <p>Objective 5:</p> <p>Develop a biosecurity plan and measures to protect against pests and disease.</p>
<p>GOAL 4: Environment</p> <p>Protect Hawaii's unique environment and quality of life and mitigate any negative impacts.</p>	<p>Objective 1:</p> <p>Ensure that the air, land, and water transportation systems respect environmental, natural, cultural and historic resources; and adopt guidelines to conserve natural resources and alleviate environmental degradation caused by motor vehicles.</p> <p>Objective 2:</p> <p>Implement sustainability and livability practices in existing and new facilities, with "sustainability" defined as: "Respect the culture, character, beauty, and history of our State's island communities; strike a balance among economic, social, and community, and environmental priorities; and meet the needs of the present without compromising the ability of future generations to meet their own needs."</p> <p>Objective 3:</p> <p>Assess sustainability and livability for air, land, and water transportation facilities and operation practices.</p> <p>Objective 4:</p> <p>Support the programs of state and federal natural resource agencies; and support ongoing lines of communication and coordination with these agencies.</p> <p>Objective 5:</p>

Goals	Objectives
	<p>Encourage transportation systems that improve the quality of life, public health, and welfare of Hawaii’s people, and that are consistent with land use plans.</p> <p>Objective 6:</p> <p>Assist with streamlining environmental process by identifying categories of environmental mitigation that include but are not limited to critical habitat, environmentally sensitive areas, noise, and pollution avoidance.</p> <p>Objective 7:</p> <p>Adapt to the effects of global climate change and build resilience in the transportation system. Address the effects of a one meter sea level rise and extreme weather events anticipated to occur during and by the end of the 21st century on Hawaii’s air, land and water transportation facilities and provide responses to this threat in modal facility plans.</p> <p>Objective 8:</p> <p>Prevent and minimize the transport of invasive species (pests and diseases).</p>
<p>GOAL 5: Economy</p> <p>Ensure that the air, land and water transportation facility systems support Hawaii’s economy and future growth objectives.</p>	<p>Objective 1:</p> <p>Support the multimodal transportation needs in the military, tourism, agriculture, health, education, energy, and technology sectors of Hawaii’s economy; and identify sector needs, current and projected, as they relate to movement of people and goods.</p> <p>Objective 2:</p> <p>Create a commodity flow and freight handling system that is dependable, efficient, economical, secure and rapid for connecting the ports, land transportation facilities, and industrial/commercial land use and storage areas.</p> <p>Objective 3:</p> <p>Provide reliability, dependability and redundancy for commerce in the import and export goods movement system including inspection facilities at ports; address actions for security of commerce.</p> <p>Objective 4:</p> <p>Create modern air, land and water transportation systems that are part of a positive visitor experience.</p>
<p>GOAL 6: Energy</p> <p>Support the state energy goal of 70% clean energy, which includes 40% produced by renewable energy and 30% from increased energy efficiency, enhancing the reliability and security of energy sources.</p>	<p>Objective 1:</p> <p>Support the national goal to reduce transportation-related greenhouse gas emissions and reliance on foreign oil.</p> <p>Objective 2:</p> <p>Actively pursue actions in transportation which help to achieve the State Clean Energy Goal of 40% renewable energy by 2030; and use integrated action plans from the Department of Business, Economic Development & Tourism’s Lead by Example Energy Initiatives with priority transportation actions that would support the Hawaii Clean Energy Initiative.</p> <p>Objective 3:</p> <p>Identify ways to increase energy efficiency by 30% at transportation facilities; and identify projects and programs for increased efficiency of energy in support of the Hawaii Clean Energy Initiative; Leadership in Energy and Environmental Design; and other green initiatives for more efficient use of energy.</p> <p>Objective 4:</p> <p>Expand the use of alternative fuel and electric vehicles; provide electric recharging at transportation facilities.</p> <p>Objective 5:</p>

Goals	Objectives
	<p>Use opportunities where and when practicable and available, to use solar (heating and photovoltaic), wind, geothermal and ocean resources to supply power to create electricity for transportation facilities.</p>
<p>GOAL 7: Funding</p> <p>Create secure, flexible and sustainable revenues and funding sources for transportation needs.</p>	<p>Objective 1:</p> <p>Develop a statewide framework for long-range financial forecasting; and within this framework, distinguish between system preservation, capacity enhancement, and modernization needs that are funded from user-financing (Harbors and Airports) and user-tax financing (Highways and Transit).</p> <p>Objective 2:</p> <p>Identify sources and develop and secure funding for the sustainable delivery, maintenance, operation, rehabilitation and replacement, and expansion of the state transportation systems.</p> <p>Objective 3:</p> <p>Ensure funding for the safety and security of the state transportation systems.</p> <p>Objective 4:</p> <p>Maximize the use of federal programs and funding for needed transportation infrastructure; use federal non-recurring initiatives and funding sources such as American Recovery and Reinvestment Act and report on project and program achievements.</p> <p>Objective 5:</p> <p>Study the reliability and viability of future transportation financing streams and funding and consider scenarios for innovative and nontraditional financing.</p> <p>Objective 6:</p> <p>Achieve project readiness in support of new funding sources as they become available; and report on achievements of project completion.</p>
<p>GOAL 8: Planning</p> <p>Implement a statewide planning process that correlates land use and transportation while supporting decision-making and programming for Hawaii's integrated, comprehensive, multimodal transportation systems.</p>	<p>Objective 1:</p> <p>Achieve the federal requirements for a comprehensive, cooperative and continuing (3C) transportation planning process; and continue to improve efficient and effective planning.</p> <p>Objective 2:</p> <p>Maintain a dynamic planning process that ensures coordination and cooperation between the state, federal, counties, private sector, and general public.</p> <p>Objective 3:</p> <p>Incorporate new and evolving methods of public involvement, communication and social networking to keep others informed of transportation planning efforts, opportunities for participation in decision-making and programming; continue to regularly update the DOT Public Involvement Policy.</p> <p>Objective 4:</p> <p>Create and implement an Integrated Subregional Area Planning initiative that links strategic planning to project implementation for all modes through a visioning process; and seek funding to begin the Integrated Subregional Area Planning for one or more areas of critical state importance.</p> <p>Objective 5:</p> <p>Keep abreast of current and evolving programs and regulations that affect transportation in Hawaii.</p> <p>Objective 6:</p> <p>Seek wider application of geospatial technologies, further develop the land use database development, and integrate visioning in transportation planning.</p>

Goals	Objectives
	<p>Objective 7: Develop performance measures to manage strategic goals and assets and to assist with better decision-making, communication, transparency, and accountability to stakeholders.</p>

Alignment with Planning Factors

The HSTP was developed within the same planning framework as the Statewide Federal-Aid Highways 2035 Transportation Plan. The focus of the goals and objectives for the HSTP is at a higher/policy level considering the air/water/land transportation modes. The land transportation plans will be in alignment with the HSTP transportation policy goals and will focus specifically on land transportation issues and needs.

Disability and Communication Access Board, State of Hawaii

Department of Health

Purpose and Content

The Disability and Communication Access Board (DCAB) is established under the State Department of Health. They perform the following duties and functions:

- Establish guidelines for the design of buildings and facilities by or on behalf of the state and counties.
- Provide review and recommendations on all state and county plans for buildings and facilities.
- Establish guidelines for the use of communication access services provided for persons who are deaf, hard-of-hearing, or deaf-blind in state programs and activities.
- Administer the statewide program for parking for disabled persons.
- Serve as public advocate of persons with disabilities by providing advice and recommendations on matters relating to access for persons with disabilities, with emphasis on legislative matters, administrative rules, policies, and procedures of the state and county governments.
- Review and assess the problems and needs relating to access for persons with disabilities in the state to provide recommendations in the improvement of laws and services.
- Serve as the designated state agency to coordinate the efforts of the state to comply with the requirements of the Americans with Disabilities Act for access to services, employment, telecommunications, and facility and site design.
- Provide technical assistance and guidance to, but not limited to, state and county entities in order to meet the requirements of state, federal, and county laws providing for access for persons with disabilities through public education programs and other voluntary compliance efforts.
- Administer funds allocated for its work, including disbursement and allocation of funds that may be available from public and private sources.

Findings Related to the Plan

Coordination with DCAB will occur throughout the development of the plan to address transportation needs and requirements of the disabled, compliance with Americans with Disabilities Act and address policy that prohibits discrimination on the basis of disability.

Alignment with the Planning Factors

The function of DCAB aligns with the Accessibility and Mobility planning factor, by supporting the enhancement of both infrastructure and services to improve mobility and equity.

***Bike Plan Hawaii*, HDOT, 2003**

Purpose and Content:

Bike Plan Hawaii is a tool to integrate bicycling into the state's transportation system. The plan outlines how the state intends to accommodate and promote bicycling. It draws on a combination of existing and future bicycle facilities, policies, and programs to ensure a successful bicycle network. The purpose of the bike plan is to establish a long-term strategy for bicycle facility improvements, enable better coordination between transportation and land-use planning, increase the ability to leverage funds for bicycle facilities, and provide a mechanism to achieve community consensus.

Findings Related to the Plan

Development of the Statewide Federal-Aid Highways 2035 Transportation Plan will take into account the objectives and goals of *Bike Plan Hawaii*, which include promoting bicycling as a convenient means of transportation by providing a safe, shared roadway system for all modes of travel.

Alignment with the Planning Factors

Bike Plan Hawaii aligns with the Environment and Sustainability and Safety planning factors through promotion of sustainable transportation mode choices by requiring safe and efficient bike routes. It also aligns with the Modal Integration planning factor by encouraging appropriately designed, safe, shared roadways for motor vehicles and bicycles.

The bike plan also aligns with the Economic Vitality planning factor because it recommends bicycle tourism and the idea that safe bike paths on scenic byways should be promoted to visitors to Hawaii through the tourism authority.

Statewide Pedestrian Master Plan, HDOT, 2013

Purpose and Content

The Statewide Pedestrian Master Plan is a current effort being developed to increase pedestrian safety and mobility and reduce pedestrian-related traffic fatalities within the state transportation system. The plan will identify the most critical needs of our highway system, including safety improvements or repairs, and will develop projects and programs to address the problems. A priority list of projects and programs will be developed to provide guidance on the most efficient and effective use of resources.

Findings Related to the Plan

The draft vision and goals for the Pedestrian Master Plan are listed below:

Draft Vision Statement

A vision statement describes the desired future condition—what will occur if implementation of the pedestrian master plan is effective and successful. A working vision is provided below. This vision will be further refined with additional input from HDOT and the advisory committees.

Hawaii's integrated and balanced transportation system provides a strong pedestrian network that encourages walking to reduce environmental impacts, foster healthy lifestyles and sustainable communities, strengthen economic development, and conserve energy. More people are choosing to walk in Hawaii as a result of enhanced mobility, accessibility, safety, and connectivity throughout the transportation system.

Draft Goals to Support the Vision

Draft goals have been developed to support the working vision. These goals relate to the Hawaii Statewide and Regional Long Range Land Transportation Plans. There are seven principal goals.

In order to support Hawaii's safe and integrated multi-modal transportation system:

1. Enhance overall pedestrian mobility and accessibility throughout Hawaii.
2. Improve pedestrian safety.
3. Increase pedestrian connectivity in communities and activity areas.

In order to protect and enhance Hawaii's unique environment and quality of life:

4. Promote walking as an option for reducing environmental impacts.
5. Encourage walking to foster healthy lifestyles and sustainable communities.

In order to encourage the transportation system's support of Hawaii's economy and future growth objectives:

6. Support smart growth and economic development by creating vibrant, pedestrian-oriented communities and activity areas.

In order to support the state's energy efficiency goals:

7. Promote and support walking as a viable transportation mode and enhance access to transit to reduce overall energy use.

Alignment with the Planning Factors

The Statewide Pedestrian Master Plan aligns with a number of the planning factors, including:

- Increasing Safety for nonmotorized users by enhancing overall pedestrian mobility and accessibility throughout Hawaii, improving pedestrian safety and increasing pedestrian connectivity in communities and activity areas.
- Increasing Accessibility and Mobility by enhancing overall pedestrian mobility and accessibility throughout Hawaii and increasing pedestrian access options in communities and activity areas.
- Enhancing the Environment by promoting walking as an option for reducing environmental impacts and encouraging walking to foster healthy lifestyles and sustainable communities.
- Enhancing Integration and Connectivity by enhancing overall pedestrian mobility and accessibility throughout Hawaii and increasing pedestrian connectivity in communities and activity areas.
- Supporting the Economic Vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency by supporting smart growth and economic development by creating vibrant, pedestrian-oriented communities and activity areas.

Complete Streets Task Force, HDOT, 2010

Purpose and Content

Act 54, SLH 2009 requires the HDOT and the county transportation departments to adopt a Complete Streets policy and establish a temporary Complete Streets Task Force (CSTF) consisting of representatives from Hawaii's transportation stakeholders. The Complete Streets policy seeks to reasonably accommodate convenient access and mobility for all users of the public highways, roadways, and streets statewide, including pedestrians, bicyclists, transit users, motorists, and persons of all ages and abilities while providing the safe and efficient movement of people and goods. The CSTF reviewed existing state and counties highways design standards and guidelines and made recommendations to the Complete Streets policy, Complete Streets framework, design standards, performance measures, implementation, and funding strategies. The Complete Streets Legislative Report, which documents the activities and recommendations of the CSTF, was submitted to the Legislature in November 2010.

Findings Related to the Plan

The CSTF recommended that Complete Streets principles shall be considered on all planning efforts, as well as development, capital improvement, and maintenance projects.

The Complete Streets principles include:

- **Safety** – Plan, design, and construct transportation facilities and land developments to create an environment that reduces risk and supports the safe movement of people and goods by all modes.
- **Flexible design (context-sensitive solutions)** – Design transportation facilities using best practices that integrate community values and recognize the importance of the surrounding context and environment.
- **Accessibility and mobility for all** – Plan and design transportation facilities for ease of use and access to destinations by providing an appropriate path of travel for all users, and enhance the ability to move people and goods throughout the state and its counties.
- **Use and comfort of all users** – Ensure all users of all abilities including bicyclists, pedestrians, transit riders, and drivers feel comfortable and safe using the transportation system.
- **Consistency of design standards and guidelines** – Encourage consistent use of national best practices to generate consistency in the application of striping and pavement markings for all users on all islands. References of national best practices include the *Manual on Uniform Traffic Control Devices and A Policy on Geometric Design of Highways and Streets (American Association of State Highway and Transportation Officials Green Book)*.
- **Energy efficiency** – Plan, design, and construct a transportation system that offers transportation choices for residents and visitors and reduces reliance on single-occupant vehicles to improve energy efficiency in travel, and mitigates vehicle emissions.
- **Health** – Recognize the health benefits in providing alternative mode choices, while acknowledging that some routes may be healthier than others.

- **Appropriate funding** – Support a jurisdiction’s ability to secure funding for multimodal facilities and provide a framework to consider and pursue funding sources and opportunities.
- **Building partnerships with organizations statewide** – Build partnerships among the HDOT, the counties, other governmental agencies, and stakeholders to implement complete streets throughout the state.
- **Green Infrastructure/Streets** – Use trees and landscaping as integral components of a Complete Street to provide both human and ecosystem benefits, such as shade, to reduce the urban heat island effect, vegetation for carbon sequestration, reducing/filtering non-point-source pollution and sediments, retaining stormwater, increasing groundwater recharge, and providing wildlife habitat.

Alignment with the Planning Factors

The Complete Streets policy will help to support the Economic Vitality, protect and enhance the Environment, as well as improve roadway Safety and increase Accessibility and Mobility for travelers.

Federal-Aid and State Highway Update: System Identification and Functional Classification, HDOT, 2013

Purpose and Content

The state highway system is an integrated network of federal-aid highways serving the land transportation needs of the State of Hawaii. The current functionally classified public roads was developed by HDOT and the counties (and concurred with) in 1993 by the Federal Highways Administration. Since then, each county has experienced substantial changes in population, density, land use boundary amendments, subdivisions, and resorts/commercial/industrial developments. Due to these changes, reevaluation and classifying of the entire state's public roads will be conducted.

Existing conditions and facilities will be analyzed and will include a review of current system maps, policies, regulations, and requirements and an identification of system gaps. Analysis will include an identification of current urban boundaries and recommended adjustment to the boundaries given the development and density changes since the last plan update.

Findings Related to the Plan

Needs and recommendations for revisions to the urban boundaries, federal aid system map and statewide highway system map will be developed and coordinated with plan development.

Alignment with the Planning Factors

Proper classification of areas and roadways based on the character of intended service or function addresses the planning factors at all levels of projects (planning, design, and operations and maintenance).

Hawaii Strategic Highway Safety Plan 2007-2012, HDOT

Purpose and Content

The *Hawaii Strategic Highway Safety Plan 2007-2012* addresses issues related to improving traffic safety data collection, increasing traffic safety awareness, and other crucial traffic safety issues. The vision of the plan is to have Hawaii's road users to arrive safely at their destinations. The goal of the plan is to reduce the number traffic-related fatalities from an average of 135 a year (from 2001 to 2005) to 100 or fewer by 2012. The safety plan identifies seven emphasis areas that are particularly pertinent and pressing in Hawaii, including: aggressive driving, impaired driving, occupant protection, pedestrians and bicyclists, motorcycle and moped safety, facility design (roadway and intersection operations), and data and safety management.

Findings Related to the Plan

The Safety Plan provides a background of these seven issues and suggests key policy strategies that address these issues through legislation and funding, enforcement, data needs, transportation and land use planning, education and community action, and engineering strategies. Strategies related to the Statewide Federal-Aid Highways 2035 Transportation Plan are summarized below:

Curbing Aggressive Driving

- Enact legislation that enables photo enforcement and earmarks traffic citation funding.
- Apply Intelligent Transportation Systems to improve traffic flow, evaluate speed limits, and conduct road safety audits.
- Use crash data to identify high-risk areas/areas to focus resources.

Combating Impaired Driving

- Enact legislation that obtains and reinvests dollars to support impaired driving programs.
- Develop a standardized accident report form, coordinated data collection and accessible crash database.

Protecting Vehicle Occupants

- Enact legislation that obtains and reinvests dollars to support impaired driving programs.

Safeguarding Pedestrians and Bicyclists

- Provide funding to address enforcement shortfall and increase enforcement.
- Improve and standardize data related to use and accidents.
- Update zoning codes, design standards.
- Prioritize nonmotorized needs.
- Provide infrastructure and coordination program support at the county level.

Ensuring Motorcycle and Moped Safety

- Increase funding for motorcycle/moped safety programs.
- Improve motorcycle crash data and use to identify high-risk areas/ areas to focus resources.

Building Safer Roads by Design

- Implement striping and signing management systems.
- Install more visible signs (letter size) and delineators, improve slopes/ditches and obstacles, create medians and add guardrails where needed.
- Develop streamlined process for delivery of local road projects.
- Implement road features/designs that reduce conflicts.
- Coordinate with Police to incorporate safe enforcement areas.
- Pursue projects on a priority basis where safety issues are known.
- Adopt rights of way and management policies that maintain clear zones as designed.
- Develop a coordinated transportation master plan that emphasizes safety and accommodates users.

Improving Data and Safety Management Systems

- Establish leadership towards long-term commitment to improve data and management systems.
- Assess existing data, needs, and linking/integration of data.
- Obtain funding needed to improve data, information flow, and create and maintain an effective safety management system.

Alignment with Planning Factors

The Hawaii Strategic Highway Safety Plan supports the **Safety** planning factor through setting policy and developing strategies to increase the safety of the transportation system for both motorized and nonmotorized users.

State of Hawaii Multi-Hazard Mitigation Plan, Hawaii State Civil Defense Agency, 2007

Purpose and Content

The purpose of the *State of Hawaii Multi-Hazard Mitigation Plan* is to protect human lives and reduce or minimize property loss during a natural hazard. Planning for hazard mitigation can also minimize economic disruption (by reducing the immediate costs of response and recovery) and ecosystem degradation caused by a natural disaster.

This update to the 2004 multihazard mitigation plan is generally based on the four county mitigation plans, and includes input from several agencies on gaps realized and lessons learned from recent natural disaster events. The plan focuses on assessing risk of certain types of natural hazards in the state, and identifying potential mitigation strategies to address these risks. Mitigation strategies should be integrated with other community needs and goals, and could include physical measures (such as improving warning systems and building structures that withstand hurricane forces) as well as regulatory measures (such as creating land planning guidelines to restrict development in high-risk hazard areas).

Findings Related to the Plan

Goals and objectives of the Multi-Hazard Mitigation Plan were developed by the state in order to provide a framework or foundation for developing mitigation strategies:

- **Goal 1** - Protect life and ensure safety of people in Hawaii.
- **Goal 2** - Develop and implement the Statewide Hazard Mitigation Plan based on a comprehensive multihazard risk and vulnerability assessment.
- **Goal 3** - Ensure the protection of the state's natural, built, historical, and cultural assets.
- **Goal 4** - Ensure the long-term viability of the state's economy and the livelihood of the local population.
- **Goal 5** - Ensure public awareness of risks, vulnerability, and multihazard mitigation actions through public education.

Objectives of the plan include:

- Improve lifelines, infrastructure, ports of entry and critical facilities, and reduce vulnerability to hazards.
- Work with the counties to assist in improvements of building codes and building inventories and assessments.
- Encourage appropriate coastal-dependent development that reduces risks from coastal hazards at all stages of development.
- Encourage and support the adoption, enforcement, training in, and updating of building codes and standards that minimize the threat to life, health, and property damage caused by natural hazards.
- Encourage and support the adoption, implementation, and updating of plans (including land use, resource management, and other state and county plans) that incorporate

natural hazard elements (including risk and vulnerability, hazard maps, hazard mitigation best practices and standards).

- Ensure adequacy of building codes and standards, land use regulations, and zoning standards.
- Develop reconstruction and rehabilitation plans to ensure rapid recovery from disasters.

Mitigation actions include ensuring that all lifeline infrastructures are able to withstand hazard events or have contingency plans to quickly recover after a disaster, and that all emergency response critical facilities and communication systems remain operational during hazard events. The long-range plan will be developed with consideration given to the above strategies.

Alignment with the Planning Factors

The multihazard mitigation plan supports the planning factors by promoting Safety, and enhancing Transportation Access and Mobility and Security during a natural hazard event.

Coordinated Public Transit Human Services Transportation Plan, Transportation for Elderly Persons and Persons with Disabilities, Jobs Access and Reverse Commute, New Freedom; HDOT; July 3, 2008

Purpose and Content

The Coordinated Service Plan (CSP) investigated coordination of transportation services for persons with special needs (elderly, disabled, low-income). The plan assessed various government, private and nonprofit programs that provide transportation services and sets the foundation for coordination and integration of services to address gaps and minimize overlaps of service.

The mission of the plan is “to provide for the safe, economic, efficient and convenient movement of people and goods.”

Findings Related to the Plan

The Federal Transit Authority 5310, 5316, and 5317 programs (Transportation for Elderly Persons and Persons with Disabilities, Job Access and Reverse Commute, and New Freedom) authorize formula assistance to states that address the needs of the elderly, those with disabilities, and welfare/low income individuals.

Goals and strategies developed in the CSP present potential actions for implementation:

- **Goal 1:** Achieve an integrated multimodal transportation system that provides mobility and accessibility for people and goods. Proposed public and coordinated human service transport strategies to meet this goal:
 - Acquiring more vehicles
 - Centralized operations and facilities
 - Expansion of fixed and paratransit services and routes
 - Acquiring additional accessible taxis
 - Expansion of services
 - Mobility center
 - Scheduler
- **Goal 2:** Ensure the safety and security of the air, land, and water transportation systems. Proposed public and coordinated human service transport strategies to meet this goal:
 - Centralized operations and facilities
 - Training
 - Education and marketing
 - Tracking system
- **Goal 3:** Protect and enhance Hawaii’s unique environment and improve the quality of life. Proposed public and coordinated human service transport strategies to meet this goal:
 - Sustainable programmatic practices
 - Sustainable equipment and facilities

- **Goal 4:** Support Hawaii’s economic vitality. Proposed public and coordinated human service transport strategies to meet this goal:
 - Acquiring more vehicles
 - Centralized operations and facilities
 - Expansion of fixed and paratransit services and routes
 - More efficient funds collection
 - Expansion of services
- **Goal 5:** Implement a statewide planning process that is comprehensive, cooperative, and continuing. Proposed public and coordinated human service transport strategies to meet this goal:
 - Continued communication
 - Creation of a work group

Alignment with Planning Factors

The CSP aligns and is consistent with Hawaii Statewide Transportation Plan’s primary goals, objectives, and strategies.

Goals 1 through 4 align directly with the Accessibility and Mobility, Safety, Security, and Environment planning factors.

State Comprehensive Outdoor Recreation Plan 2008 Update, State of Hawaii, Department of Land and Natural Resources, April 2009

Purpose and Content

The State Comprehensive Outdoor Recreation Plan (SCORP) is required to be eligible for Land and Water Conservation Funds assistance with the acquisition and development of public lands for outdoor recreation. Hawaii's SCORP serves as a tool for statewide outdoor recreation planning and action. It is intended to guide federal, state, county, and private agencies in Hawaii in the planning, development, and management of Hawaii's outdoor recreation resources. The SCORP directs Land and Water Conservation Funds grant funding into facilities that best meet the public's outdoor recreation needs, based on the priorities set during the plan development.

The plan outlines statewide trends, provides an inventory, and identifies jurisdictions that contribute to recreational facilities as well as contributing funding sources.

The SCORP's identified priorities include:

- Protect natural and cultural resources.
- Manage recreation resources and facilities.
- Meet the needs of recreation users.
- Provide access to recreation resources.
- Seek funding.

Findings Related to the Plan

The HDOT Highways Division is responsible for administering federal funds from the former SAFETEA-LU, which authorizes reimbursements to agencies for transportation related projects, including trails, bikeways and other facilities with recreation potential.

HDOT provides recreational opportunities by developing bikeways on state highways, beautifying major highways and providing scenic roadside lookouts.

Approximately 0.3 percent of the State Fuel Tax (up to \$250,000) is deposited to the Special Land and Development Fund of the Department of Land and Natural Resources for the purposes of management, maintenance and development of Na Ala Hele trails and trail accesses.

The SCORP's strategic plan proposes actions to address priority issues. Recommendations related to HDOT and the long-range plans include the following:

- Increase the number and range of resources and facilities to support expanded participation in walking, jogging, and bicycling as healthy activities and transportation by developing a comprehensive network of safe and well-maintained linear paths and lanes.

Actions:

- Support implementation of Bike Plan Hawaii and regional plans.

- Develop networks of nonvehicular linear paths within urban and residential areas, linking communities.
- Improve sidewalks within neighborhoods by planting shade trees and installing lighting.
- Minimize conflicts between multiple activities and user groups competing for the same recreation resources, including conflicts between visitors and residents, between youth and adult leagues, or between various trail and ocean users.

Actions:

- Provide signage and other sources of information about user rights-of-way on multiuse trails.
- Improve access to shorelines and public forest areas by protecting existing accesses, creating new accesses, and reestablishing access to areas that are currently blocked or restricted by private landownership and/or development.

Actions:

- Provide directional and entry signage to public recreation areas.
- Provide an equitable distribution of recreation resources throughout the state.

Action:

- Develop trail networks that offer easy access from urban and suburban areas to rural areas.
- Explore nonrevenue sources for supporting acquisition, recreation programs, and maintenance of recreation resources.

Action:

- Request funds for bikeway development by aggressively seeking available funding for bikeway and greenway projects.

Alignment with Planning Factors

The SCORP addresses a number of the planning factors, with a focus on nonmotorized modes. These include Connectivity of communities, increasing Safety, and enhancing the Environment and quality of life.

National Wildlife Refuges, US Fish and Wildlife Service

Purpose and Content

The mission of the US Fish and Wildlife Service is “working to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.” There are nine refuges in the State of Hawaii:

- The Big Island (Hakalau) National Wildlife Refuge Complex consists of the Hakalau Forest Unit on the windward slope of Mauna Kea and the Kona Forest Unit on the western slope of Mauna Loa.
- The Kauai Complex includes Kilauea Point National Wildlife Refuge on the north side of the island, Hanalei National Wildlife Refuge in the Hanalei River Valley, and Huleia National Wildlife Refuge on the southeast side of Kauai.
- The Oahu Complex includes the James Campbell National Wildlife Refuge on the northeast shore of Oahu, the Oahu Forest National Wildlife Refuge on the upper slopes of the Koolau Mountains, and the Pearl Harbor National Wildlife Refuge in Pearl Harbor.
- The Kakahaia National Wildlife Refuge is on the south coast of Molokai.
- The Kealia Pond National Wildlife Refuge is along the south central coast of Maui.

Findings Related to the Plan

- Each of the wildlife refuges conducts a multiyear planning process to develop a 15-year Comprehensive Conservation Plan (CCP) and environmental assessment (EA) that will guide the management of fish, wildlife, plants, habitats and public uses. The goals and objectives, and ultimately projects stemming from the plan should be consistent with these initiatives.
- Hakalau has a Draft CCP and EA (August 2010). Discussion of the draft plan is in the Plan and Policy Review (Island of Hawaii).
- The Kauai Complex of national wildlife refuges has just begun their CCP/EA processes.
- The James Campbell and Pearl Harbor National Wildlife Refuges are approximately 2 years into the planning process. Discussion of the draft plans is in the Plan and Policy Review (Island of Oahu).
- The Kakahaia and Kealia Pond National Wildlife Refuges started their planning process in 2009. Discussion of the draft plans is in the Plan and Policy Review (islands of Maui/Molokai/Lanai).

Alignment with Planning Factors

Consistency with the National Wildlife Refuge long-term plans supports the Environment and Sustainability of Hawaii’s natural habitats.

National Parks, National Park Service

Purpose and Content

Since 1916, the American people have entrusted the National Park Service (NPS) with the care of their national parks. With the help of volunteers and park partners, the NPS safeguards nearly 400 places with more than 275 million visitors every year.

The NPS works with tribes, local governments, nonprofit organizations, businesses, and individual citizens in revitalizing their communities, preserving local history, celebrating local heritage, and creating close to home opportunities for kids and families to get outside, be active, and have fun.

Hawaii is home to eight national parks. The parks are famous for volcanoes, beautiful landscapes and complex ecosystems that offer unusual hiking and camping opportunities. Additionally, Hawaii national parks were established to preserve native activities, history and culture both ancient and modern.

- Hawaii: Ala Kahakai National Historic Trail, Hawaii Volcanoes National Park, Kaloko-Honokohau National Historical Park, Puuhonua O Honaunau National Historical Park, and the Puukohola Heiau National Historic Site
- Maui: Haleakala National Park
- Molokai: Kalaupapa National Historical Park
- Oahu: World War II Valor in the Pacific National Monument

Findings Related to the Plan

The NPS is developing General Management Plans for Hawaii Volcanoes National Park, Kalaupapa National Historical Park and Haleakala National Park. The management plans will develop visions for the future of these national parks, and guide the management of the parks for the next 15 to 20 years. The goals and objectives, and ultimately projects stemming from the plan should be consistent with these initiatives.

The Ala Kahakai National Historic Trail has a completed Comprehensive Management Plan. Discussion of the plan is in the Plan and Policy Review (Island of Hawaii).

Alignment with Planning Factors

Consistency with NPS long-term plans supports the Environment and Sustainability of Hawaii's natural habitats, as well as the Economic Vitality of the State, through attraction and accommodation of visitors.

Active Living Workshops, State of Hawaii, Department of Health

Purpose and Content

The Department of Health Healthy Hawaii Initiative conducted workshops around the state to promote active living. Active living communities are designed to provide opportunities for people of all abilities to engage in routine daily physical activity and have access to healthy and affordable foods. Active living is promoted by having bicycle- and pedestrian-friendly designs, mixed-use developments, recreational facilities and schools located in walkable neighborhoods.

The initiative partnered with the Safe Routes to School program to provide an integrated approach for safety, health and transportation efficiency.

Findings Related to the Plan

The initiative is focused on getting more people physically active in safe environments and creating healthy environments and neighborhoods.

Alignment with Planning Factors

The initiative focuses on increasing Safety for nonmotorized modes.

Hawaii 2050 Sustainability Plan, State of Hawaii, 2008

Purpose and Content

The *Hawaii 2050 Sustainability Plan* provides guidance to assure that the preferred future of Hawaii is met. Recognizing a growing number of pressing issues and the threat to the quality of life for the future generations, the development of a sustainability plan to address the vital needs of Hawaii is needed. The development of the plan was initiated by the Legislature and incorporated recommendations from a 25-member task force group. The plan identified five major goals to achieve the preferred future by 2050, outlined strategic actions to achieve the goals, and specified indicators to measure the performance.

Findings Related to the Plan

Five major goals to achieve the preferred future of Hawaii by 2050 provide a framework for developing strategic actions. The five major goals are:

- **Goal 1: A Way of Life** - Living sustainably is part of daily practice in Hawaii.
- **Goal 2: The Economy** - Hawaii's diversified and globally competitive economy enables citizens to meaningfully live, work, and play in Hawaii.
- **Goal 3: Environment and Natural Resources** - Natural resources are responsibly and respectfully used, replenished, and preserved for future generations.
- **Goal 4: Community and Social Well Being** - The Hawaiian community is strong, healthy, vibrant, and nurturing, striving to provide safety nets for those in need.
- **Goal 5: Kanaka Maoli and Island Values** - Kanaka Maoli and island cultures and values are thriving and perpetuated.

Alignment with Planning Factors

The plan supports Economic Vitality and promotes protecting and enhancing the Environment in various ways. The plan also suggests increasing Accessibility and Mobility through increasing access to public transportation, encouraging telecommuting and increasing and improving bicycle and pedestrian facilities.

Hawaii Tourism Authority Strategic Plan: 2010-2012, Hawaii Tourism Authority

Purpose and Content

The *Hawaii Tourism Authority Strategic Plan: 2005-2015* identifies a shared vision for Hawaii tourism in the year 2015 by Hawaii's tourism stakeholders. It is intended to guide stakeholders in working together to attain the state's vision that Hawaii is the best place to live, work, and visit. The plan stresses that a successful tourism industry depends on all government agencies, community organizations and industry groups.

A Strategic Plan: 2010-2012 was developed after the completion of the Strategic Plan: 2005-2015 in response to the economic crisis. Objectives and goals were identified for the short-term (2010) and long-term (2011-2012) implementation.

Findings Related to the Plan

The plan recognized the importance of maintaining and improving transportation access, infrastructure and services, and identified strategic directions to support the air, land and sea transportation systems. Strategic directions to improve the land transportation system include:

- Updating and implementing highway master plans.
- Studying the impacts of increased cruise and ferry usage on traffic and roadway infrastructure.
- Monitoring resident sentiments and visitor satisfaction data.
- Conducting periodic traffic impact assessments, and ongoing and coordinated planning to make appropriate improvements.
- Encouraging collaboration between transportation providers and accommodations and attractions providers.
- Providing better informational and directional signage.
- Prioritizing and funding targeted road improvements and creatively exploring funding sources.
- Exploring alternatives means of ground transportation.
- Exploring federally funded programs.

The plan also encourages coordination, collaboration and improved ground transportation services including improving public transportation service between airports and hotels.

Alignment with Planning Factors

The plan aligns with the Economic Vitality planning factor as the overall plan strategizes to support the tourism industry. The plan also supports improving Accessibility and Mobility and enhancing the Integration and Connectivity of the transportation systems, as well as promoting Safety for both visitors and residents, and protecting and enhancing the Environment.

Coastal Storms Program, National Oceanic and Atmospheric Administration

Purpose and Content

The frequency and intensity of coastal storms are intended to increase, according to current predictions. With each storm, increasing water levels will allow storm surge to reach farther inland, leading to greater impacts and damage.

The Coastal Storms Program (CSP) is a networked program with partnerships between National Oceanic and Atmospheric Administration and other federal, state, and local organizations designed to increase the resiliency of coastal communities from coastal storm impacts. The CSP is intended to develop community risk and vulnerability assessments, improved weather forecasting, observations, increased integration of outreach and existing tools.

The Pacific Islands portion of the program is currently programmed for Fiscal Year 2010 funding. Specifically, the goals and objectives include promoting improved weather observations/predictions and communication to remote communities.

Findings Related to the Plan

This section is not applicable because specific areas and products have not been completed.

Alignment with Planning Factors

The initiative focuses on increasing Security and Safety for communities by preparing for the hazards associated with coastal storms, earthquakes and sea level rise impacts.

Hawaii Coastal Zone Management Program, National Oceanic and Atmospheric Administration and Office of State Planning, 1990

Purpose and Content

Coastal Zone Management (CZM) is about looking at coastal areas as an ecosystem that is an interrelated whole rather than at the individual species, resources, or uses. CZM is about balancing the needs of economic development and conservation of resources in a sustainable manner. The Hawaii CZM area encompasses the entire state. What occurs on land, even on the mountains, will impact and influence the quality of the coastal waters and marine resources.

Since approval of Hawaii's program in 1977 (Chapter 205A, Hawaii Revised Statutes), this unique federal-state partnership has proven to be a strong basis for protecting, restoring and responsibly developing the state's important and diverse coastal communities and resources.

Hawaii's CZM Program was enacted to provide a common focus for state and county actions dealing with land and water uses. As the state's resource management policy umbrella, it is the guiding perspective for the design and implementation of land and water uses and activities throughout the state. Within the scopes of their authorities, agencies must assure their statutes, ordinances, rules, and actions comply with the CZM objectives and policies.

Within a framework of cooperation among federal, state, and local levels, the Hawaii CZM Program employs a wide variety of regulatory and non-regulatory techniques to address coastal issues and uphold environmental law. Among them are stewardship, planning, permitting, education and outreach, technical assistance to local governments and permit applicants, policy development and implementation, and identification of emerging issues and exploration of solutions.

Findings Related to the Plan

The CZM outlines requirements and responsibilities of various agencies to support interrelated objectives and policies including:

- Recreational and Historic Resources
- Scenic and Open Space Resources
- Coastal and Stream Ecosystems/Water Quality Management
- Economic Uses
- Coastal Hazards
- Managing Development

Alignment with Planning Factors

The CZM objectives and policies address enhancement of the Environment through resource, land, and water quality management. The CZM encourages Modal Integration and Economic Vitality by managing and protecting coastal resources and uses supporting community, tourism, and freight.

Accessibility and Mobility are upheld for all modes of transportation through permitting and development review/management. Integration and Connectivity of modes are also stressed as the interrelation of all activities is the focus of the CZM.

Hawaii Statewide Transportation Improvement Program, HDOT, Current Update, Fiscal Year 2011 to 2014 (+2)

Purpose and Content

The Hawaii Statewide Transportation Improvement Program (STIP) is a multimodal transportation program that provides a multiyear listing of state and county projects identified for federal or special funding. The STIP is developed based on existing transportation plans and policies, and current highway, transit and transportation planning processes. It is prepared by HDOT in cooperation with the Oahu Metropolitan Planning Organization, DOT Services, City and County of Honolulu, County of Hawaii, County of Maui, and County of Kauai. To qualify for funding, STIP projects must be consistent with each county's long-range plan and/or the Statewide Transportation Plan. In addition, STIP projects can only be located on roadways functionally classified greater than collector roads, and local neighborhood roads are not eligible for STIP funding.

Currently, HDOT is in the process of updating the STIP for the next 4-year cycle. Priorities and needs, project readiness and eligibility, and public opinion of highway and transit projects statewide have been reviewed for inclusion in the next Federal Fiscal Year 2011-2014 (+2) STIP.

Findings Related to the Plan

Review of the STIP will be important to understand existing planned improvements on state facilities, which will be considered as the future baseline transportation network.

Alignment with Planning Factors

The STIP projects will allow for identification of spending allocations related to the planning factors based on planned project's alignment with HDOT programs and funding categories.

Report on the State of Physical Infrastructure in Hawaii, Hawaii Institute for Public Affairs, July 2010

Purpose and Content

The purpose of this report is to provide substantive research, data and information on Hawaii's statewide physical infrastructure needs. The report includes a consolidated statewide summary of state and county infrastructure projects planned over a 6-year period (2010-2015) and a summary of funding requirements to maintain and/or improve them. Based on available information, findings of the report focus primarily on capital improvements projects (CIP). The report also examines Hawaii's infrastructure resiliency in the face of natural hazards.

This report is the first of two phases. Phase II will examine issues such as land use and funding policies that impact infrastructure development.

Findings Related to the Plan

The report recognizes the importance and needs of the state transportation infrastructure. Review of the needs and planned efforts in the short-term will be important to help understand existing planned improvements and validate baseline transportation network. The potential impacts from natural hazards should also be considered.

Alignment with Planning Factors

The report emphasizes the importance of the state transportation infrastructure and recognizes that the transportation system is vital to the state's Economy. The report also raises awareness on increasing Security and Safety for communities by preparing for the natural hazards.

Statewide Federal-Aid Highways 2035 Transportation Plan and Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai

Plan and Policy Review (District of Hawaii)

TO: State of Hawaii Department of Transportation (HDOT)
FROM: CH2M HILL
DATE: November 2, 2010

Introduction

The planning team reviewed regional policies and plans relevant to development of the Statewide Federal-Aid Highways 2035 Transportation Plan and the Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai.

This summary of regional plans and policies was an important first step to ensure that the statewide and regional federal-aid plans:

- Reflected consistency through alignment of goals and objectives.
- Built effectively on previously adopted plans and policies.
- Complied with regional requirements.
- Had guidance and structure for development of potential solutions.

The plan and policy summaries help to shape the goals for the statewide and regional transportation plans and the definition of potential solutions.

Regional Plans and Policies

Regional plans and policies are more specific than federal or statewide plans and policies in that they address a smaller geography and define specific projects for specific island contexts.

The regional plans and policies are generally consistent with statewide policy direction. These regional plan reviews will be used to inform the development of the Statewide Federal-Aid Highways 2035 Transportation Plan and the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii (plans).

The following plans and policies were examined for the District of Hawaii:

- *Hawaii County General Plan (2005)*
- *Island of Hawaii Community Development Plans (2008)*
- *Hilo Bayfront Trails Master Plan (2009)*

- *Hawaii County Long Range Land Transportation Plan (1998)*
- *Hawaii Multi Hazard Mitigation Plan (2005)*
- *Hawaii Commercial Harbors 2020 Master Plan (1998)*
- *Kona International Airport at Keahole Airport Master Plan (2010)*
- *Hilo International Airport Master Plan (2002)*
- *Waimea-Kohala Airport Master Plan (1999)*
- *Upolu Airport Master Plan (1999)*
- *Hakalau Forest National Wildlife Refuge Comprehensive Conservation Plan [CCP] and Environmental Assessment [EA] (Ongoing)*
- *Ala Kahakai National Historic Trail (2009)*
- *County of Hawaii Transportation/Capital Improvement Plan (TIP/CIP) Capital Budget and Six-Year Capital Improvements Program FY2010-2011*

Hawaii County General Plan, County of Hawaii, 2005

Purpose and Content

The *Hawaii County General Plan* (General Plan) specifies goals and policies for various elements considered community assets, such as natural resources, historic resources, public facilities and utilities, recreational resources, economic resources, housing, transportation, and land use. The General Plan includes the countywide CIP list and breaks down analysis of existing conditions and identified deficiencies by general district areas in Hawaii County: Puna, South Hilo, North Hilo, Hamakua, North Kohala, South Kohala, South Kona, North Kona, and Kau. The General Plan encourages but does not mandate the creation of Community Development Plans for each county district area. The General Plan calls for submitting an annual report to the County Council with the purpose for the annual report being to reconcile capital and operating budgets, and prioritize and assess competing community needs from a countywide perspective.

Findings Related to the Plan

Recommended courses of action to improve transportation facilities and provide safer, faster, more pleasant travel were documented by district. Actions related to roadways that could influence the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii include:

Puna

- Explore developing a mid-level roadway makai of Highway 130, beginning at the Hawaiian Beaches Subdivision and extending through Hawaiian Paradise Park Subdivision with a connection to Railroad Avenue in South Hilo. Consider a bikeway along the same alignment.
- Encourage widening Highway 130 to four lanes with a median and channelized intersections or modern roundabouts.

South Hilo

- Improve Old Mamalahoa Highway to provide a secondary north-south route along the Hamakua coast.
- Widen and improve major east-west collector roads between the old Mamalahoa Highway and the Belt Highway.
- Construct the proposed improvements and extension of Highway 200 (Saddle Road) from Kaumana Drive to the Queen Kaahumanu Highway in South Kohala.
- Coordinate with the state on closure of the Bayfront Highway and relocation of the existing Highway 19/Pauahi Street intersection.
- Improve Akolea Road between Piihonua and Kaumana Drive and construct its extension to the upper reaches of Ainaola Drive to provide a cross-city connection between Upper Wailuku and Waiakea-Uka.

North Hilo

- Improve those portions of the Hawaii Belt Highway at Maulua, Laupahoehoe, and Kaawalii Gulches.
- Realign Hawaii Belt Highway at Kapehu Camp.
- Install additional passing lanes at various sections along Highway 19.

Hamakua

- Install additional passing lanes at various sections along Highway 19.
- Construct a scenic highway from the Waipio Valley lookout extending mauka to connect to Mud Lane at the entrance of Waimea.
- Consider alternatives in the management of Pakalana Street, such as its conveyance to the State Department of Education or its conversion to a one-way traffic pattern.

North Kohala

- Encourage the improvement of the Kohala Mountain Road and the portion of Akoni Pule Highway between the towns of Hawi to Niulii.

South Kohala

- Encourage construction of a Waimea bypass road (and connector roads) from Mud Lane to Mamalahoa Highway on the Kona side of Waimea.
- Encourage the construction of a new Waimea to Kawaihae road from Mamalahoa Highway to the Queen Kaahumanu Highway.
- Install suitable bikeways and/or jogging paths.
- Develop connector roads to relieve traffic congestion through Waimea town.

North Kona

- Develop a roadway network circulation plan in cooperation with the state. Upon adoption of plan, the recommendations shall be incorporated on the zone district maps.
- Encourage widening of Queen Kaahumanu Highway between Kona International Airport at Keahole and Kailua-Kona, and between Henry Street and Kamehameha III Road to accommodate increases in traffic flows.
- Construct Keohokalole Highway (mid-level road) from Palani Road to proposed University Drive. Construct a collector road from Keohokalole Highway extending north to Mamalahoa Highway.
- Construct the Kahului-Keauhou Parkway (Alii Highway) from Queen Kaahumanu Highway to Keauhou.
- Construct the Mamalahoa Bypass Highway between Keauhou and Captain Cook as a Scenic Corridor, with limited access and without commercial development.

- Provide vertical connectors from Alii Drive to Kuakini Highway.
- Install suitable bikeways and/or jogging paths.
- Extend Lako Street to connect to Alii Drive.
- Establish the old railroad right-of-way as a pedestrian and bicycle right-of-way.

South Kona

- Extend Halekii Street to connect to the proposed Mamalahoa Bypass Highway.
- Develop a roadway network circulation plan in cooperation with the state. Upon adoption of plan; recommendations shall be incorporated on the zone district maps.
- Construct the Mamalahoa Bypass Highway between Keauhou and Captain Cook as a Scenic Corridor, with limited access and without commercial development.
- Install suitable bikeways and/or jogging paths.

Kau

- Improve Mamalahoa Highway, realigning where necessary.
- Explore alternatives and means to establish an evacuation route through Hawaiian Ocean View Estates Subdivision to Highway 11, in cooperation with the residents of Ocean View.

These recommendations will be considered when developing the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii to identify long-range solutions and the future transportation baseline network.

Alignment with the Planning Factors

The General Plan focuses on improvements to existing infrastructure that will increase mobility which supports the Transportation Access Mobility, Economic Vitality, and System Preservation planning factors. The plan also promotes expanding mobility within the existing roadway system and increases mobility for various transportation modes, which promotes System Efficiency Management and Operations planning factors.

Island of Hawaii Community Development Plans Kona (2008), North Kohala (2008), South Kohala (2008), Puna (2008), Kau (ongoing), Hamakua (ongoing), Hilo

Purpose and Content

The current *Hawaii County General Plan*, approved in 2005 by the County Council is the broad planning document for the Island of Hawaii. The General Plan encourages districts within the County to plan for the future through the implementation of Community Development Plans.

Community Development Plans translate the broad General Plan goals and policies into implementation actions specific to respective districts.

There are seven Community Development Plan areas in the County of Hawaii: Kona, North Kohala, South Kohala, Puna, Kau, Hamakua, and Hilo. The Kau and Hamakua Community Development Plans are in draft only, while the Hilo area does not have a draft plan available for review.

The community plans provide specific recommendations to address the goals, objectives, and policies contained in the General Plan, while recognizing the values and unique context of the individual community.

Findings Related to the Plan

The structure of each of the community plans varied, but essentially provided goals, objectives, policies and implementing actions for each of their respective communities.

Goals, objectives, and policies of the various Community Development Plans relevant to the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii are summarized in the attached table.

Alignment with the Planning Factors

The Community Plans vary in their emphasis based on the context and priorities of the various communities. A major focus of the Community Development Plans align with the Environment and Sustainability factor through recognition that land use planning, directed growth and associated transportation infrastructure is critical to maintaining the unique character and cultural significance of the specific communities while efficiently accommodating long term growth. Additionally, the community plans support Modal Integration with emphasis on transit, pedestrian, bicycle, and equestrian transport. Another emphasis area included Safety and Security improvements by planning and providing for emergency and evacuation needs of remote communities as well as improved connectivity between neighborhoods/communities.

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment
Kona	<p>Objective: Develop a multimodal transportation system to encourage walking, biking, transit, and other nonvehicular modes of travel.</p> <p>Policy:</p> <ul style="list-style-type: none"> Revise current street design standards to improve design of facilities that accommodate the disabled and pedestrians or bicycles. Develop primary and secondary transit routes to improve connectivity, and serve transit-oriented land use developments. For example, Develop Keohokalole Highway as a transit route between Kailua Village and the airport. Establish secondary transit route connecting Kailua Village with Keauhou and areas mauka of Queen Kaahumanu and Kuakini highways. Add nonmotorized facilities to existing streets when routine maintenance or repair work occurs. 	<p>Objective: Develop a system of interconnected roads that provide alternative routes for automobiles while maintaining mobility on higher functioning roadways.</p> <p>Policies:</p> <ul style="list-style-type: none"> Ensure that new developments meet connectivity standards for connections to adjacent properties, maximum block sizes, and future development. Encourage access management on existing arterials and major collectors by minimizing new driveways or intersections. New development should access higher functioning roads from local streets. 	<p>Objective: Develop land uses that allow efficient access to transit and support minimal reliance on automobiles.</p> <p>Policies:</p> <ul style="list-style-type: none"> Develop compact, mixed-use land uses along transit routes. Provide transit options and walking routes in Kona. Encourage village-style developments. 	<p>Objective: Minimize human impacts on natural resources by planning developments with respect to the environment.</p> <p>Policy:</p> <ul style="list-style-type: none"> Implement a landscaping maintenance program. Use reclaimed wastewater where available.
North Kohala	<p>Goal: Maintain rural infrastructure.</p> <p>Strategy:</p> <ul style="list-style-type: none"> Develop and implement rural infrastructure standards. 	<p>Goal: Provide for adequate drivable (mauka-makai) public access to coastal and mountain areas.</p> <p>Strategies:</p> <ul style="list-style-type: none"> Revise and improve Chapter 34 of the Hawaii County Code dealing with public access Encourage increased cooperation and coordination among agencies, land owners and the community. Implement a long-range plan for achieving adequate public access as part of the Community Development Plan. <p>Include a continuous coastal path from Pololu to Kawaihae Harbor, Mauka-makai easements between the coastal path and Akoni Pule Highway, Mauka-makai easements between Akoni Pule Highway and the Kohala mountains, and a lateral mountain road (Wylie Boulevard) from Pololu to Taga Pond.</p> <p>Goal: Revamp, repair, and/or replace aging or damaged infrastructure; improve emergency preparedness; and prioritize and implement future improvements to public facilities and services.</p> <p>Strategies:</p> <ul style="list-style-type: none"> Improve emergency preparedness and response. Improve existing roadway systems and create emergency bypass roads. 		<p>Goal: Direct growth to areas within and near existing town centers to preserve the district's open space, cultural resources, and promote agriculture.</p> <p>Strategy:</p> <ul style="list-style-type: none"> Establish a view plane protection program along Kohala Mountain Road and Akoni-Pule Highway corridors.
South Kohala		<p>General Policy: Provide for the transportation and circulation needs of the South Kohala Community and for commuters.</p> <p>Subpolicies:</p> <ul style="list-style-type: none"> For new major roads, incorporate Complete Street standards. Establish bicycle, pedestrian, and equestrian travel ways to link up the communities within the Hawaii District, and establish alternate travel ways within the individual communities. 	<p>General Policy: Preserve the culture and sense of place of South Kohala communities.</p> <p>Sub Policies:</p> <ul style="list-style-type: none"> Develop a concurrency management system for infrastructure concurrency 	<p>General Policy: Develop guidelines and programs that promote environmental stewardship and the concept of sustainability.</p> <p>Subpolicies:</p> <ul style="list-style-type: none"> Preserve visually and environmentally important open space grasslands, ocean views, views of the puu, and South Kohala's unique "Five Mountain Views."

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment
		<ul style="list-style-type: none"> • Build safe roads. • Identify and establish transit corridors for future mass transit service within the Highways District. <p>General Policy:</p> <ul style="list-style-type: none"> • Develop programs and standards that will protect the South Kohala Community from natural hazards, including major storms, flooding, tsunami, lava flows and wildfires. <p>Subpolicies</p> <ul style="list-style-type: none"> • Develop plans and programs for emergency routes so that people can safely move away from life-threatening natural hazards. 		<ul style="list-style-type: none"> • Update Lighting code and enforcement of the code. • Incorporate the concept of sustainability as defined in the <i>State of Hawaii 2050 Sustainability Plan</i> in future planning and projects.
Puna		<p>Goal: Increase mass transit options and complement the development of the villages with transit service.</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Convert bus routes to hub and spoke service. • Coordinate transit service with paratransit and school transportation. • Provide park-and-ride lots. • Ensure that pedestrians can access bus stops safely. <p>Goal: Provide adequate emergency and evacuation routes.</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Create alternative/redundant routes for Highways 11,130, and 132 using existing routes wherever possible, develop the Puna Makai Alternative Route with the least environmental and socio-economic impacts. • Develop local traffic connectivity network <p>Goal: Provide pedestrian and bicycle-friendly roads.</p> <p>Objective:</p> <ul style="list-style-type: none"> • Improve appropriate “roads in limbo” that are used widely for public access. <p>Goal: Provide highways with design features that improve safety, particularly at intersections. Provide highways that are aesthetically pleasing and compatible with Puna character, and allow for increased county and community influence over highway planning and design decisions.</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Make safer intersection access a higher priority over highway traffic speed. • Consider roundabouts. • Use native landscaping. • Incorporate traffic-calming features into highway design in preference to signage and signalization where possible. 	<p>Goal: Manage growth by encouraging a more efficient, environmentally sustainable land use pattern, i.e. “village centers”. Villages would be planned for three levels of characteristics – regional village, community village and neighborhood village – each providing varying degrees of services and amenities, with all addressing the stop of sprawl development. This will provide better accessibility for businesses and services.</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Develop criteria for village location, scale, uses and design. • Enhance villages by allowing expanded infrastructure to support compact development and multimodal travel. 	<p>Goal: Reduce the reliance of fossil fuels for transportation.</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Promote ride-sharing, vanpools, carpools, and telecommuting opportunities. • Provide more services and employment within the villages to reduce commute trips <p>Goal: Provide a contiguous network of scenic trails between and within subdivisions for walking, bicycling, and horseback riding. Designate and improve routes as “Scenic Byways.”</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Develop and preserve historic trails for nonmotorized travel. • Identify and develop scenic byways. <p>Goal: Reduce the percentage of single-occupant vehicles during peak commute periods and the percentage of residents who commute to employment and services outside of Puna.</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Promote ride-sharing, vanpools, carpools, and telecommuting opportunities. • Provide more services and employment within the villages to reduce commute trips.

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment
		<p>Goal: Provide safe walking and bicycling routes to schools, parks and bus stops, and safe crossings on Highways 130 and 11.</p> <p>Objective:</p> <ul style="list-style-type: none"> • Implement a Safe Routes to School program. 		

Hilo Bayfront Trails Master Plan, County of Hawaii, June 2009

Purpose and Content

The *Hilo Bayfront Trails Master Plan* was developed to plan, design, and construct a path for nonvehicular modes from the Wailuku River to Hilo Harbor. The path will allow residents and visitors to enjoy the shoreline features of Hilo Bay. The plan also includes connections to existing recreational sites within the Bayfront area.

Findings Related to the Plan

The Hilo community developed the overarching plan goals:

- Enhance the area's natural beauty.
- Increase access for residents and visitors.
- Highlight the site's cultural significance.
- Protect the fragile coastline and waterways surrounding the Hilo Bayfront.

Partial funding for the project has been achieved from a number of sources, and the plan is moving forward into the planning process (Environmental Assessment and Special Management Area Use Permit).

Alignment with the Planning Factors

The *Hilo Bayfront Trails Master Plan* aligns with a number of the planning factors, including:

- Increasing Safety for nonmotorized users by enhancing overall pedestrian mobility and accessibility through Hilo, improving pedestrian safety, and increasing pedestrian connectivity to activity areas.
- Increasing Accessibility and Mobility by enhancing overall pedestrian mobility and accessibility options through Hilo.
- Enhancing the Environment by promoting walking as an option for reducing environmental impacts and encouraging walking to foster healthy lifestyles and sustainable communities.
- Enhancing Integration and Connectivity by enhancing overall pedestrian mobility and accessibility through Hilo and increasing pedestrian connectivity to activity areas.
- Supporting the Economic Vitality of the Island, especially by improving connectivity to the cruise ship terminal.

Hawaii Long-Range Land Transportation Plan, HDOT, May 1998

Purpose and Content

The *Hawaii Long-Range Land Transportation Plan* (LRLTP) was developed in cooperation with the County of Hawaii. It serves as a guide to major surface transportation facilities needs to year 2020. The LRLTP, including prioritization, was not completed for this submittal.

The LRLTP contains a financial element that identifies both current and potential future sources of revenue that may be available for implementation of the plan. Overall, \$1.317 billion in the plan period was estimated for construction (does not include the costs for engineering studies and design, rights-of-way, relocation of utilities, or environmental mitigation measures).

The LRLTP was developed in accordance with requirements of the 1991 Intermodal Surface Transportation Efficiency Act. The LRLTP was developed under the auspices of the Countywide Transportation Planning Process-Hawaii to involve the appropriate parties and secure their commitment and support of the recommendations.

Findings Related to the Plan

The recommended capacity projects are summarized below, in Table 6-2, pulled from the LRLTP.

TABLE 6-2
HAWAII LONG RANGE LAND TRANSPORTATION PLAN
MAJOR HIGHWAY CAPACITY FUTURE IMPROVEMENT NEEDS

No.	Facility	Location	Description/Improvements	Cost (in Millions)
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Islandwide Circulation Area (see Figures 6-1 through 6-3)

1 S	Hawaii Belt Road (HWY 11)	Mountain View to Keaau	Widen from two lanes to four lanes with separate turning lanes at major intersections	\$39.1
2 S	Hawaii Belt Road (HWY 11)	Keaau to Makalika Street	Widen from four-lane divided highway to six-lane divided highway	\$17.6
3a S	Hawaii Belt Road (HWY 19)	Waianuenue Avenue to Honomu	Widen existing two-lane highway to provide passing lanes, also intersection and safety improvements	\$39.6
3b S	Hawaii Belt Road (HWY 19)	Honomu to Honokaa	Widen existing two-lane highway to provide passing lanes, also intersection and safety improvements	\$65.2
3c S	Hawaii Belt Road (HWY 19)	Honokaa to Mud Lane	Widen existing two-lane highway to provide passing lanes, also intersection and safety improvements	\$22.3
4a S	Queen Kaahumanu Highway (HWY 19)	Kona International Airport Road to Waikoloa Road	Widen existing two-lane highway to four-lane divided highway with improvements at major intersections	\$143.0
4b S	Queen Kaahumanu Highway (HWY 19)	Waikoloa Road to Kawaihae-Waimea Road	Widen existing two-lane highway to four-lane divided highway with improvements at major intersections	\$63.2
5a S	Keaau-Pahoa Road (HWY 130)	Keaau Bypass to Paradise Drive	Widen from two lanes to four lanes with separate turning lanes at major intersections	\$37.8
5b S	Keaau-Pahoa Road (HWY 130)	Paradise Drive to Pahoa Bypass	Widen from two lanes to four lanes with separate turning lanes at major intersections	\$16.8
6 C	Mamalahoa Highway (HWY 190)	Waimea Bypass to Lindsey Road	Widen from two lanes to four lanes with separate turning lanes at major intersections	\$10.0
7a S	Saddle Road (HWY 200)	Kaumana to John A. Burns Way (Mauna Kea Access Road)	Reconstruct existing two-lane highway to provide geometric design, intersection and safety improvements	\$36.5
7b S	Saddle Road (HWY 200)	John A. Burns Way (Mauna Kea Access Road) to MP 42	Reconstruct existing two-lane highway to provide geometric design, intersection and safety improvements	\$50.0 (a)
7c S	Saddle Road (HWY 200)	MP 42 to Mamalahoa Highway	New two-lane highway with separate turning lanes at major intersections (realign existing road to intersect with Mamalahoa Highway at or near the Waikoloa Road intersection)	\$40.2

**TABLE 6-2
HAWAII LONG RANGE LAND TRANSPORTATION PLAN
MAJOR HIGHWAY CAPACITY FUTURE IMPROVEMENT NEEDS**

No.	Facility	Location	Description/Improvements	Cost (in Millions)
8a C	Komohana Street Extension	Leimamo Street to Hawaii Belt Road (Volcano Highway)	New two-lane highway with separate turning lanes at major intersections	\$21.2
8b C	Komohana Street Extension	Waianuenue Avenue to Hawaii Belt Road via Wainaku Drive	New two-lane highway with separate turning lanes at major intersections	\$11.7
9 C	North Kulani Road	Hawaii Belt Road to Stainback Highway	Reconstruct existing two-lane road to current design and safety standards (in conjunction with Project No. 12)	\$7.1
10 C	Paniolo Drive Extension	Paniolo Drive terminus to Waimea-Kawaihae Road	New two-lane highway with separate turning lanes at major intersections	\$25.0
11a C	Railroad Avenue Extension	Hilo/Puna Boundary to Hawaiian Paradise Park Sub.	New two-lane highway with separate turning lanes at major intersections	\$22.5
11b C	Railroad Avenue Extension	Hawaiian Paradise Park Sub. to Kahakai Blvd. (Hawaiian Beaches Subdivision)	New two-lane highway with separate turning lanes at major intersections	\$17.1
12 S*	Stainback Highway	North Kulani Road to Hawaii Belt Road	Reconstruct existing road to a two-lane highway which conforms to current design standards (in conjunction with Project No. 9)	\$12.0
13 C	Waikoloa Road	Mamalaho Highway to Queen Kaahumanu Highway	Widen from two lanes to four lanes or new two-lane road from western terminus of Saddle Road realignment	\$64.0
14a S	Waimea Bypass (Mud Lane Sec.)	Mud Lane to Waimea Airport	New two-lane highway with separate turning lanes at major intersections	\$36.6
14b S	Waimea Bypass (Lalamilo Sec.)	Mamalaho Highway to Queen Kaahumanu Highway	New two-lane highway with separate turning lanes at major intersections	\$76.8
14c S	Waimea Bypass (Kawaihae Sec.)	Queen Kaahumanu Highway to Akoni Pule Highway	New two-lane highway with separate turning lanes at major intersections	\$4.7
15 C	Waimea Connector Road	Mamalaho Highway/Kamamalu Street intersection to Kamuela Race Track	New two-lane highway with separate turning lanes at major intersections	\$7.1
16 C/S	Waimea-Kawaihae Road	Kohala Mountain Road to Mamalaho Highway (including section of Lindsey Road)	Widen existing two-lane highway to four-lane divided highway with improvements at major intersections	\$6.6

C County Highway

S State Highway

S* Stainback Highway is under the jurisdiction of State Corrections

(a) Funding is committed for highway improvement project

Note: Provisions for bicycle and pedestrian traffic should be incorporated whenever feasible

**TABLE 6-2
HAWAII LONG RANGE LAND TRANSPORTATION PLAN
MAJOR HIGHWAY CAPACITY FUTURE IMPROVEMENT NEEDS**

No.	Facility	Location	Description/Improvements	Cost (in Millions)
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Hilo Circulation Area (see Figure 6-4)

17 C/S	Kalaniana'ole Avenue (HWY 137)	Kanoelehua Avenue to Hilo Harbor	Widen existing two-lane highway to four lanes with separate turning lanes at major intersections	\$4.5
18 S	Kanoelehua Avenue (HWY 11)	Makalika Street to Kalaniana'ole Avenue	Widen existing four-lane divided highway to six-lane divided highway, including intersection improvements as required	\$15.7
19 C	Kawili Street	Puainako Street to Kilauea Avenue	Widen existing two-lane road to four lanes, including intersection improvements	\$3.5
20 C	Kekua'anoa Road	Kilauea Avenue to Kanoelehua Avenue	Widen existing two-lane street to four lanes with separate turning lanes at major intersections	\$4.6
21 C	Komohana Street	Puainako Street to Waianuenu Avenue	Widen existing two-lane highway to four lanes with separate turning lanes and/or signals at major intersections	\$9.0
22 C	Komohana Street Extension	Ainaola Drive to Leimamo Street	New two-lane highway extension to Leimamo Street including intersection improvements	\$3.1
23a C	Kupulau Street Improvement	Ainaola Drive to Kawai'ani Street	Reconstruct existing two-lane road to current design and safety standards	\$4.0
23b C	Kupulau Street Extension	Kawai'ani Street to Puainako Street Extension	New two-lane road with separate turning lanes at major intersections	\$3.1
23c C	Kupulau Street Extension	Puainako Street Extension to Komohana Street/Ponohawai Street intersection	New two-lane road with separate turning lanes at major intersections	\$10.4
24 C	Lanika'ula Street/ Kumukoa Street	Mohouli Street to Kanoelehua Avenue	Widen existing two-lane road to four lanes including intersection improvements	\$5.3
25 C	Mohouli Street	Komohana Street to Kilauea Avenue	Widen existing two-lane road to four lanes including intersection improvements	\$5.2
26 C	Mohouli Street Extension	Komohana Street to Ainako Avenue/Kaumana Drive intersection	New two-lane highway with improved, signalized intersections at both termini	\$5.0 (a)
27 S	Puainako Street (HWY 2000)	Kilauea Avenue to Komohana Street	Widen existing two-lane road to four-lane divided highway with intersection improvements; realign segment between Kawili Street and Komohana Street	\$17.6
28 C	Puainako Street Extension	Komohana Street to Country Club Road at Kaumana Drive	New two-lane highway with separate turning lanes at major intersections	\$17.1

C County Highway

S State Highway

(a) Funding is committed for highway improvement project

Note: Provisions for bicycle and pedestrian traffic should be incorporated whenever feasible

**TABLE 6-2
HAWAII LONG RANGE LAND TRANSPORTATION PLAN
MAJOR HIGHWAY CAPACITY FUTURE IMPROVEMENT NEEDS**

No.	Facility	Location	Description/Improvements	Cost (in Millions)
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Kona Circulation Area (see Figures 6-5 and 6-6)

29a C	Alii Highway	Hawaii Belt Road to Royal Poinciana Drive	New four-lane divided highway including intersection improvements as required	\$19.6
29b C	Alii Highway	Royal Poinciana Drive to Kamehameha III Road	New four-lane divided highway including intersection improvements as required	\$28.3
29c C	Alii Highway	Kamehameha III Road to end of Alii Drive	Widen existing two-lane road to four lanes including intersection improvements as required	\$7.6
30a C	Alii Highway Extension	Alii Highway terminus to Mamalahoa Hwy/Napoopoo Road intersection	New two-lane highway including intersection improvements as required	\$20.0 (a)
30b C	Alii Highway Extension	Alii Highway terminus to Mamalahoa Hwy/Napoopoo Road intersection	Widen (proposed) two-lane highway to four lanes, including intersection improvements as required	\$25.7
31 S	Hawaii Belt Road (HWY 11)	Palani Road to Kuakini Highway	Widen existing two-lane highway to four lanes including intersection improvements	\$12.7
32 S	Hawaii Belt Road (HWY 11)	Captain Cook to Keala o Keawe Road (Hwy 160)	Widen existing two-lane highway to four lanes including intersection improvements	\$27.8
33 C	Hina Lani Street	Henry Street Extension to Queen Kaahumanu Highway	Widen existing two-lane road to four lanes including intersection improvements	\$4.2
34a C	Henry Street Extension (Mid Level Road)	Palani Road to Kealakehe Parkway	New two-lane highway including intersection improvements as required	\$7.6
34b C	Henry Street Extension (Mid Level Road)	Kealakehe Parkway to Hina Lani Street	New two-lane highway including intersection improvements as required	\$6.0
34c C	Henry Street Extension (Mid Level Road)	Hina Lani Street to Kaiminani Drive	New two-lane highway including intersection improvements as required	\$11.9
35 C	Hualalai Road	Alii Drive to Kuakini Highway	Widen existing two-lane road to five lanes including intersection improvements	\$2.4
36 C	Kamehameha III Road	Kuakini Highway to Alii Drive	Widen existing two-lane road to four lanes including intersection improvements	\$8.7
37 C	Kaiminani Drive	Henry Street Extension to Queen Kaahumanu Highway	Widen existing two-lane road to four lanes including intersection improvements	\$3.9
38a C	Kealakaa Street Extension	Existing terminus to Hina Lani Street	New two-lane road including intersection improvements as required	\$7.1

**TABLE 6-2
HAWAII LONG RANGE LAND TRANSPORTATION PLAN
MAJOR HIGHWAY CAPACITY FUTURE IMPROVEMENT NEEDS**

No.	Facility	Location	Description/Improvements	Cost (in Millions)
38b C	Kealakaa Street Extension	Hina Lani Street to Kaiminani Drive	New two-lane road including intersection improvements as required	\$4.9
39 S	Kealakehe Parkway Extn.	Kealakehe Parkway terminus to Hawaii Belt Road	New two-lane highway including intersection improvements as required	\$16.2
40 C	Kuakini Highway	Makala Boulevard to Palani Road	Widen existing two-lane highway to four lanes including intersection improvements	\$3.6
41a C	Kuakini Highway	Palani Road to Hualalai Road	Widen existing two-lane highway to five lanes, including center turning lane and intersection improvements	\$3.8
41b C	Kuakini Highway	Hualalai Road to Hawaii Belt Road	Widen existing two-lane highway to four lanes including intersection improvements	\$13.4
42a S	Kuakini Highway	Hawaii Belt Road to Kamehameha III Road	Widen existing two-lane highway to four lanes including intersection improvements	\$10.6
42b S	Kuakini Highway	Kamehameha III Road to Mamalahoa Highway	Widen existing two-lane highway to four lanes including intersection improvements	\$19.2
43 C	Mamalahoa Highway	Napoopoo Road intersection to Captain Cook	Widen existing two-lane highway to four lanes including intersection improvements	\$7.4
44 S	Queen Kaahumanu Highway (HWY 19)	Kona International Airport Road to Palani Road	Widen existing two-lane highway to four-lane divided highway including intersection improvements	\$42.4

C County Highway

S State Highway

(a) Funding is committed for highway improvement project

Note: Provisions for bicycle and pedestrian traffic should be incorporated whenever feasible

Transit improvements are referenced for further study in the Countywide Transit Plan.

Bicycle improvements are referenced to the 1994 Bike Plan Hawaii recommendations. Additionally, conceptual “nonmotorized roadways” identified for Hilo, Kailua-Kona, Waimea, and Puna are also referenced for further studies.

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii shall consider project recommendations. These recommendations, however, were developed over 10 years ago and will be vetted against current conditions and long-range priorities. The travel demand model, land use and stakeholder input will address appropriateness of the remaining recommendations.

Alignment with the Planning Factors

The plan recommendations focused on Economic Vitality, and Mobility by planning to provide for the efficient movement of people and goods.

Hawaii Multi-Hazard Mitigation Plan, County of Hawaii, Civil Defense Agency, May 2005

Purpose and Content

The purpose of the *Hawaii County Multi-Hazard Mitigation Plan* is to protect people and structures from harm and destruction caused by natural hazards, which typically include (but are not limited to) floods, earthquakes, hurricanes, drought, and wildfires. Natural hazards that are somewhat unique to the island of Hawaii include tsunamis and lava flows. It is also intended to minimize costs and manage the disruption during response to a hazardous event. The plan does not focus on human-caused hazards such as terrorism or hazardous waste events.

This multi-hazard mitigation plan focuses on assessing risk of certain types of natural hazards on the county, outlining and coordinating technical and financial resources to help respond to hazards, and identifying potential mitigation strategies to address these risks. Mitigation strategies should be integrated with other community needs and goals, and could include physical measures (such as improving warning systems and building structures that withstand hurricane forces) as well as regulatory measures (such as creating land planning guidelines to restrict development in high-risk hazard areas).

Findings Related to the Plan

Goals of the multihazard mitigation plan that could be applicable to the plan include the following:

- Control future development and retrofit existing structures within hazard areas to minimize losses.
- Ensure that emergency response critical facilities and communication systems remain operational during hazard events.
- Ensure that lifeline infrastructures are able to withstand hazard events or have contingency plans to quickly recover after a disaster.

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii will be developed with consideration given to the above goals.

Alignment with the Planning Factors

The multihazard mitigation plan supports the planning factors by promoting Safety; encouraging a Sustainable Environment; and enhancing Transportation Access, Mobility, and Security during a natural hazard event.

Hawaii Commercial Harbors 2020 Master Plan, HDOT Harbors Division, August 1998

Purpose and Content

The *Hawaii Commercial Harbors 2020 Master Plan* provides long-range guidance for ensuring efficient, accessible, economical, and safe operations of the commercial harbor system on the Island of Hawaii. The plan also serves a guide to developing, maintaining, and enhancing the harbor system, which includes two facilities: Hilo Harbor and Kawaihae Harbor. Hilo Harbor is on the east side of the island and is the older of the two harbors. Kawaihae Harbor is on the west side of the island was created to alleviate demand on Hilo Harbor. Both facilities support multiple functions, including: handling of containerized, dry, and liquid cargo goods, passenger vessels, cruise and excursion ships, and charter fishing boats, as well as ship building, repair, and maintenance operations.

Findings Related to the Plans

Primary objectives of the harbors master plan include:

- Plan both harbors properly to provide efficient facilitation of maritime shipments for the entire island.
- Optimize the use of land and water resources committed to marine cargo, passenger and fishing operations in an economical manner.
- Provide terminals and other harbor resources and accesses within Hilo Bay and Kawaihae Bay, as well as other locations, in a manner that best serves Hawaii's port system.
- Minimize impact on environmental quality and recreational opportunities contiguous with Hawaii's port facilities.

Development of the harbors could accommodate potential increases in ocean cruise vessels and in ocean-related recreation for the tourism/visitor industry. Recommended roadway projects to support long-term growth and development of the harbors include increasing the number of access roads to Hilo Harbor and improving its surrounding roadways and intersections including Kalaniana'ole Street, Kanoelehua Street, Silva Street, and the Kawaihae Bypass Road. At Kawaihae Harbor, a new bypass connecting Queen Kaahumanu Highway to Akoni Pule Highway (bypassing the Kawaihae Harbor area) was recommended in the Final Environmental Impact Statement for the Hawaii Commercial Harbors Master Plan. This bypass would likely help maintain adequate access and traffic operations at Kawaihae Harbor. Lower-priority recommendations documented in the Final Environmental Impact Statement near Kawaihae Harbor also include widening of Queen Kaahumanu Highway south of Kawaihae Road and a new bypass road connecting Waimea to Kawaihae.

The statewide and regional long-range transportation plans will take into account the roadway needs for Hilo Harbor and Kawaihae Harbor to support maritime growth.

Alignment with the Planning Factors

The roadway improvements and recommendations outlined in the harbor plan support the Modal Integration planning factor by encouraging efficient transition between maritime and land transportation modes. It also aligns with the System Preservation and Economic Vitality planning factors because it promotes comprehensive planning of both harbors to maintain efficient use of existing highways and to improve the movement of goods and people from one side of the island to the other.

Kona International Airport at Keahole Master Plan Update, **HDOT Airports Division, October 2010**

Purpose and Content

This master plan update study provides an evaluation of the airport's capabilities and aviation demand and develops a plan for the timely development of new or expanded facilities to meet the projected demands. The goal of the master plan is to provide guidance for improvements at the Kona International Airport at Keahole for the next 20 years.

Findings Related to the Plan

The primary objective of the master plan update is to provide the community and public officials with proper guidance for future development that will address aviation demands and be wholly compatible with the environment.

Annual passengers and cargo demand at the Kona International Airport is shown below.

	2006 Actual	2030 Forecast
Passengers	3,033,212	4,721,000
Cargo	32,390	62,000
Aircraft Operations	143,218	287,900
Based Aircraft	61	160

The master plan includes improvements to the airfield, terminal, cargo, and general aviation facilities to meet the long-term forecasts for the airport.

The short term or highest priority projects focus on Phase I of the terminal modernization, as well as serving the general aviation demand. Costs for the short-term project are estimated at \$140.7 million.

Phase I of the terminal modernization will include baggage claim, flight information, and passenger amenities improvements. The general aviation improvements will include third-party developments to address underserved demand, and removing commuter services from the general aviation terminal area. Heliport take-off and terminal facilities will also be improved as part of the short-term improvements. A new Aircraft Rescue and Fire Fighting station will be build and a utilities master plan will be developed. The Road M project and additional vehicle parking are key components of the short-term improvements. Road M will provide direct access to the general aviation activities and other airport operational areas from Queen Kaahumanu Highway.

The intermediate-term projects primarily address growth in demand. These projects include the establishing the parallel general aviation runway, new cargo facilities, and additional growth in the general aviation area. The intermediate-term projects are projected to cost \$267.8 million.

To create and use the 5,500 feet parallel runway, the perimeter fence, service road, and taxiways will also need to be modified or created. Phase II of the terminal modernization will complete the expansion and the modernization program. Projects would include the consolidation of ticketing, baggage screening, inspection, and security. A second-level departure area for overseas flights would also be developed in this phase.

To support the terminal improvements, the terminal loop would be realigned and extended to Paoo Street, allowing the parking lot to be expanded by 400 stalls. Phase I of air cargo improvements include airside, cargo building and vehicle parking improvements to support demand through the intermediate planning horizon. The general aviation area will continue to develop through this phase. Paoo Street will no longer provide two-way access to Keahole Street. Halalau Street is planned to be extended north to the new cargo area to provide this access. The extension will also serve other airport uses including ground transportation expansion, aviation support areas, and airport industrial uses.

Long-term improvements are related to extended growth in airport activities, these projects should be considered if demand continues to increase. Long-term planning projects are estimated at \$371.6 million.

Long-term airfield improvements will improve efficiency, circulation, and capacity, and would include extension of the parallel runway. The long-range terminal provides additional capacity for baggage and international operations. Also as demands warrant, additional expansion to the general aviation, heliport and cargo areas would occur. The long-term improvements include development of Road P, a new primary terminal access road. This improvement would ultimately be an interchange with Queen Kaahumanu Highway. The timing of creation of this grade-separated interchange would depend on the Highways Division and developments mauka of Queen Kaahumanu.

Alignment with the Planning Factors

Kona International Airport improvements address the Economic Vitality of the state by expanding the facility to accommodate additional passengers, cargo, and overseas flights.

Improvements related to ground transportation access and ground transportation facilities acknowledge the Accessibility and Mobility planning factors and are mainly focused on vehicular access.

Hilo International Airport Master Plan, HDOT Airports Division, July 2002

Purpose and Content

The *Hilo International Airport Master Plan* is part of an ongoing planning process that builds upon previously prepared airport master plans and development plans. Its objective is to update guidelines for future airport development, which will satisfy forecasted aviation demand in a financially feasible manner, while addressing the community's environmental and socioeconomic issues and concerns. The master plan is based on a 20-year planning horizon subject to updates after 5 to 10 years. This master plan was adopted in 2002 with a planning horizon of 2020.

The objectives of the Airport Master Plan are to provide the following for agency, user, and public consideration:

- Plan for future development in a manner which satisfies forecast aviation demand, is financially feasible, and addresses community and environmental concerns.
- Prepare prioritized capital improvement program for airport development and funding.
- Inform and seek community, user, and agency involvement in the master planning process.

Findings Related to the Plan

Annual passengers and cargo demand at the Hilo International Airport is shown below.

	1992 Actual	1998 Actual	2020 Forecast
Passengers	1,573,814	1,559,494	2,196,000
Cargo	28,175	28,825	43,000
Aircraft Operations	91,055	112,479	166,900
Based Aircraft	Data Not Provided	39	54

To accommodate these projected demands, recommended improvements integrate long-term terminal area requirements with forecast aviation demand and Airport access and parking needs. It provides a guide for airport development through the year 2020 and indicates possible developments beyond the planning horizon for which land should be reserved. The functional areas of the plan focus on airport property, airfield, air traffic control, passenger terminal, commuter/helicopter, air cargo, general aviation, military/civil patrol, access and parking, utilities and administration. Estimated project costs are shown in 1999 dollars.

Phase I projects are to be initiated by 2005. Phase I includes land acquisition, a new helicopter and cargo facility and associated airfield, apron, ground circulation connections and parking. Intersection improvements are planned at the Kanoelehua/Kekuanaoa Street exit. Improvements will provide an emergency access road onto Leilani Avenue. (\$56.57 million)

Phase II projects are to be initiated by 2010. Facilities proposed for Phase II of the master plan are hangar and apron improvements in the northwest portion of the airport. The parking lot fronting the passenger terminal will also be expanded. Phase II improvements also incorporate internal access road improvements for circulation and safety. (\$19.77 million)

Phase III projects are to be initiated in 2010 and beyond. Facilities proposed for Phase III of the master plan include runway relocation/extension and associated taxiway and apron connections and navigational aid modifications. A ground transportation baseyard, service roads, further expansion of the passenger terminal parking lot and intersection improvements at the Kekuaaoa Street and Kanoelehua Avenue intersection would also occur during this phase (\$24.08 million)

Alignment with the Planning Factors

The Hilo International Airport improvements in general address the Economic Vitality of the state by expanding the facility to accommodate additional passengers and cargo.

Improvements related to ground transportation access and ground transportation facilities acknowledge the Accessibility and Mobility planning factors and are mainly focused on vehicular access to/from and within the airport facilities.

Waimea-Kohala Airport Master Plan, HDOT Airports Division, February 1999

Purpose and Content

The purpose of the *Waimea-Kohala Airport Master Plan* is to provide a comprehensive plan for the orderly development of the airport and to meet existing and forecast aviation demand through the year 2020. This master plan was adopted in 1999 with a planning horizon of 2020. The overall objectives of the Master Plan will be to

- Recommend proposed improvements that are flexible and allow the airport to meet the existing and forecast aviation demands.
- Recommend proposed improvements that consider local environment and community needs.
- Provide technical information upon which the proposed improvements can be based.

Findings Related to the Plan

Annual passengers and cargo demand at the Waimea-Kohala Airport is shown below.

	1997 Estimated	2020 Forecast
Passengers	10,400	26,600
Cargo	243	351
Aircraft Operations	10,500	20,100
Based Aircraft	10	19

To accommodate the forecast aviation demands and facility requirements, recommended improvements through the year 2020 have been outlined in three phases. Estimated project costs are shown in 1998 dollars.

Phase I projects are to be initiated by 2004. Phase I includes land acquisition, helicopter facility improvements, fencing improvements, taxiway lighting, and utility work. (\$3.8 million)

Phase II projects are to be initiated by 2009. Phase II of the master plan includes land and easement acquisition, terminal improvements, new access roadway construction, perimeter roadway construction, parking, and utility work. (\$1.385 million)

Phase III projects are to be initiated by 2020. Facilities proposed for Phase III of the master plan include construction of the remainder of the parallel taxiway, overhead utility relocation along Mamalahoa Highway, runway, and navigation improvements. Improvements also include land acquisition and construction of a new roadway to the proposed Waimea Bypass Road (\$2.880 million).

Alignment with the Planning Factors

The Waimea-Kohala Airport improvements in general address the Economic Vitality of the state by expanding the facility to accommodate additional passengers, aircraft operations, and air cargo.

Improvements related to ground transportation access and ground transportation facilities acknowledge the Accessibility and Mobility planning factors and are mainly focused on vehicular access to and within the airport facilities.

Upolu Airport Master Plan, HDOT Airports Division, March 1999

Purpose and Content

The primary objective of the *Upolu Airport Master Plan* is to prepare guidelines for future airport development which will satisfy forecast aviation demand in a sound manner, while addressing the community's environmental and socioeconomic issues and concerns. This master plan was adopted in 1999 with a planning horizon of 2020.

The objectives of the airport master plan update are to provide the following for agency, user, and public consideration:

- A graphic representation of future airport development based on forecast aviation activity within the context of current and anticipated land uses in the airport vicinity.
- The technical rationale and documentation of procedures used to formulate and assess alternatives in determining the proposed facilities and land use plan.
- Documentation of the master planning process for the airport, including the valued input of Airport users, federal, state and local agencies, and the community.

Findings Related to the Plan

Annual aircraft operations at the Upolu Airport are shown below.

Aircraft Operations	1996 Estimated	2020 Forecast
Commuter/Air Taxi	800	1,950
General Aviation	2,600	3,850
Military	600	800
Total	4,000	6,600

(There are no passenger operations, air cargo, or aircraft based at this facility)

To accommodate the forecast aviation demands and facility requirements, recommended improvements through the year 2020 have been outlined in two phases. The master plan ensures that continuing development of the Airport may occur in an orderly manner within the framework of long-range potential growth. Reservation of sufficient land to allow the potential for long-range air traffic use will protect the airport facility/operations from surrounding development encroachment.

Phase I projects are to be initiated by 2005. Phase I includes land acquisition, construction of a maintenance building, fencing and onsite wastewater. Offsite transportation improvements include widening and paving of the airport access road (\$858,000).

Phase II projects are to be initiated by 2020. Phase II of the master plan includes land acquisition for future terminal relocation, airfield expansion, apron and hangar improvements and associated utility improvements (\$1.89 million).

Alignment with the Planning Factors

The Upolu Airport improvements in general address the Economic Vitality of the state by expanding the facility to accommodate additional aircraft operations and the potential for use of the facility for passenger travel.

Improvements related to ground transportation access and ground transportation facilities acknowledge the Accessibility and Mobility planning factors and are mainly focused on vehicular access to/from the airport facility.

Hakalau Forest National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment, United States Fish and Wildlife Service, Ongoing

Purpose and Content

The Hakalau National Wildlife Refuge consists of the Hakalau Forest Unit on the windward slope of Mauna Kea and the Kona Forest Unit on the western slope of Mauna Loa. A multiyear planning process to develop a 15-year CCP and EA that will guide the management of fish, wildlife, plants, habitats, and public uses is currently being performed.

Findings Related to the Plan

The plan has developed goals related to wildlife, habitat, public use, and cultural resources.

The preferred alternative increases reforestation, restoration and ungulate (hoofed animal) removal efforts. It also increases the control of threatened and endangered plant and outplantings, invasive species and predator control. Public hunting would be closed, and staff would provide additional opportunities for outreach and environmental education and interpretation. Opportunities for land acquisition/boundary expansion would be explored, with a focus on protection of bird habitats in response to effects of climate change.

The preferred alternative identifies specific objectives related to visitor, volunteer, education, and cultural resources opportunities. The objectives may be coordinated to support appropriate levels and modes of access to the wildlife refuge from the land transportation system.

Alignment with Planning Factors

Consistency with the National Wildlife Refuge long-term plans supports the Environment and Sustainability of Hawaii's natural habitats.

Ala Kahakai National Historic Trail, Comprehensive Management Plan, National Parks Service, 2009

Purpose and Content

The *Ala Kahakai Nation Historic Trail [NHT] Comprehensive Management Plan* consists of surviving ancient trails, historic trails developed on/parallel to traditional routes and recent paths/roads that create links between segments. The trail corridor is 175 miles long, along the west coast of the island of Hawaii.

The comprehensive management plan establishes guidelines needed to fulfill the preservation and public use goals for the NHT over the next 15 years. The plan is based on the trail's purpose and historical significance. It offers strategies for resource protection, trail use, and facility development. It serves as the framework under which individual implementation plans will be developed.

Findings Related to the Plan

The National Parks Service will provide overall administration and coordination of the NHT and will consider management of state-owned trail segments. It will also coordinate with the HDOT regarding locations affected by the trail's right-of-way.

In addition to the trail, the development of facilities to administer the plan include visitor use facilities, establishment of an auto route (signs, viewpoints, exhibits), access roads, parking areas, and access to trail heads.

Alignment with Planning Factors

Consistency with the NHT long-term plans supports the Environment and Sustainability of Hawaii's natural habitats. It will support Economic Vitality, attracting visitors to this unique corridor. It will also support Modal Integration and connection to nonmotorized trails.

County of Hawaii Capital Budget and 6-year Capital Improvements Program, Fiscal Year 2010-2011

Purpose and Content

The capital budget provides a listing of projects and services for the County of Hawaii for the fiscal year 2011. It includes estimated costs and identified sources of funds.

Findings Related to the Plan

Review of the capital budget and programs will be important to understand existing planned transportation improvements on state facilities, which could be considered as the future baseline transportation network.

Alignment with Planning Factors

The capital program projects will allow for identification of spending allocations related to the planning factors based on planned project's alignment with HDOT programs and funding categories.



Appendix C

Goals, Objectives, and Strategies

Statewide Federal-Aid Highways 2035 Transportation Plan and Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai

Final Goals, Objectives, and Strategies

PREPARED FOR: State of Hawaii Department of Transportation (HDOT)

PREPARED BY: CH2M HILL

DATE: November 29, 2012

This memorandum presents goals, objectives, and strategies for the Statewide Federal-Aid Highways 2035 Transportation Plan and the Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai. Goals, objectives, and strategies are organized by eight federal planning factors (plus an additional category for the purposes of the statewide and regional federal-aid plans), which include:

1. Environment and Sustainability
2. Modal Integration
3. System Preservation
4. Security
5. Economic Vitality
6. System Efficiency Management and Operations
7. Transportation Access Mobility
8. Safety
9. Additional Goals, Objectives, and Strategies

The planning factors and associated goals, objectives, and strategies are not listed in priority order. Priorities will be developed in a subsequent task in the development of the statewide and regional federal-aid transportation plans.

Goals, objectives, and strategies of the plans are aligned with existing federal, state and local regulatory and policy requirements and the mission of HDOT. The goals, objectives, and strategies were developed and refined with input from appropriate stakeholders to develop these final statements applicable to the statewide plan and each of the regional plans. Specific objectives, strategies and priorities associated with these goals may vary between regions; however, the overarching goals of the statewide and regional plans will be consistent.

Goals, objectives, and strategies aligned with each of the federal planning factors are outlined below.

HDOT Highways Mission: To provide a safe, and efficient and accessible highway system through utilization of available resources in the maintenance, enhancement and support of land transportation facilities.

1. Environment and Sustainability

By developing transportation solutions that are sustainable and environmentally friendly, not only can the needs of the current users be met, but future generations will also have the ability to meet their own needs. Solutions can generally be focused on promoting energy conservation, slowing the pace of climate change, and improving quality of life.

Environment and Sustainability		
Goals	Objectives	Strategies
<p>1.1. Preserve and enhance the natural environment, including biological and aesthetic resources.</p>	<ul style="list-style-type: none"> • Avoid, minimize, and provide reasonable measures to mitigate degradation of the natural environment caused by transportation facilities and operations. • Construct and maintain a transportation system that complements scenic corridors and protected views. • Provide transportation facilities that complement the natural environment and enhance quality of life. 	<ul style="list-style-type: none"> • Review environmental assessments to identify potential degradation of the natural environment caused by transportation facilities and operations. • Create categories of environmental mitigation to protect habitat and ecologically sensitive areas from potential impacts of transportation facilities and operations. • Develop and maintain landscape plans that preserve the scenic environment. • Improve the aesthetic quality of gateway roads. • Provide educational interpretive sites regarding preserving and enhancing the natural environment for public viewing at scenic pull-offs, and park and rides.
<p>1.2. Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.</p>	<ul style="list-style-type: none"> • Avoid, minimize, and provide reasonable measures to mitigate degradation of Hawaii's cultural resources environment caused by transportation facilities and operations. 	<ul style="list-style-type: none"> • Review environmental assessments to identify potential degradation of cultural resources caused by transportation facilities and operations. • Create categories of environmental mitigation to protect culturally sensitive areas from potential impacts of transportation facilities and operations. • Develop a formal consultation process with Native Hawaiian Organizations. • Develop consistent and comprehensive processes for addressing cultural, natural, and historic resources. • Coordinate transportation corridor and public safety needs with the preservation of historical and cultural features.

Environment and Sustainability		
Goals	Objectives	Strategies
<p>1.3. Meet the relevant environmental regulations and standards set by federal, state, and county/city agencies. Maintain collaborative working relationships with agencies and comply with goals of their relevant plans and policies.</p>	<ul style="list-style-type: none"> • Develop transportation solutions that support federal, state, and regional natural resource agency programs. • Create transportation system solutions that meet all aesthetic, noise, air, and water quality standards. 	<ul style="list-style-type: none"> • Periodically evaluate environmental regulation compliance, evaluate compliance goals, and prioritize improvements needed. • Consult and collaborate with regulatory agencies to implement solutions.
<p>1.4. Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.</p>	<ul style="list-style-type: none"> • Develop land use and transportation infrastructure that are coordinated and compatible to promote sustainable growth and mobility. • Implement sustainability and livability practices in existing and new transportation facilities. • Create transportation solutions that promote the balance of a strong diversified economy, a clean and aesthetic environment, and a healthy quality of life. • Encourage road users to reduce impact to the environment. • Promote the use of sustainable and renewable energy sources. Support solutions that will contribute towards achieving the State Clean Energy Goal. • Create transportation facilities that support an increase in energy efficiency. Create projects and programs and 'green' initiatives to promote more efficient use of energy. 	<ul style="list-style-type: none"> • Reserve and/or develop right-of-way width for build-out conditions of multimodal transportation facilities, and utilities. • Develop cost effective, clean, and green alternative materials used in infrastructure. • Use tax incentives and public acknowledgement as means to reward road users for using less fuel, producing less pollution, providing facilities for bicyclists and pedestrians. • Develop an evaluation tool for measuring sustainability over the lifecycle of a transportation project or program. • Use integrated action plans from the Department of Business, Economic Development & Tourism's Lead by Example Energy Initiatives to support the Hawaii Clean Energy Initiative goal of 40 percent renewable energy by 2030. • Provide conveniently located and an adequate number of alternative energy fueling/recharging stations. • Pursue opportunities for developing underground utility corridors, and integrating them as separate pedestrian/bicycle paths.
<p>1.5. Promote long-term resiliency relative to all hazards mitigation, namely global climate change, with considerations to reducing contributions to climate change from transportation facilities, and reducing the future impacts of climate change on the transportation system.</p>	<ul style="list-style-type: none"> • Acknowledge that climate change will impact portions of our existing transportation infrastructure and address the potential effect of sea level rise and extreme weather changes on Hawaii's transportation facilities. • Orient transportation planning to incorporate strategies for adapting to climate change, including; sea-level rise, extreme weather events, energy costs, and energy supply disruption. 	<ul style="list-style-type: none"> • Clearly identify shoreline areas affected by climate change and develop plan to preserve or relocate at-risk transportation facilities and avoid new construction in affected zones. Utilize climate change and sea level rise data consistent with State of Hawaii current policy (which forecasts a 1-meter rise by the end of the 21st century).

2. Modal Integration

Increasing the availability of various transportation mode choices and providing efficient and attractive connections between modes expands transportation choices within the overall system. Access to and between air/ sea transport modes, motorized modes (such as public transit and automobile traffic) and non-motorized modes (bicycle and pedestrian) should be integrated to provide seamless modal connections. Applying Complete Streets principles achieves modal integration.

Modal Integration		
Goals	Objectives	Strategies
<p>2.1. Provide a Complete Streets transportation system of motorized and non-motorized options.</p>	<ul style="list-style-type: none"> • Create transportation facilities that support all modes of travel that result in a well-connected systemwide network for travel between transport modes and between communities. • Promote education and understanding of the benefits of bicycling and walking and laws applicable to each group. 	<ul style="list-style-type: none"> • Coordinate modal plans for motorized, pedestrian, bicycle, and transit modes so that uses of these interconnected systems complement each other. • Include specific training in drivers' education courses. • Include more questions about bicycle and pedestrian laws in the written driver's license exam. • Provide transit, bike ride, and walking opportunities for transportation professionals and decision-makers so they can better understand the concerns of transit riders, bicyclists, and pedestrians. • Support programs and agencies that provide bike/pedestrian safety educational materials and courses (emphasize outreach efforts on high-risk populations such as children and the elderly).
<p>2.2. Promote efficient travel between modes by creating connections and removing barriers.</p>	<ul style="list-style-type: none"> • Promote design and development of complete, integrated multimodal street systems for all users (including freight, motorists, pedestrians, bicycles, transit, etc.) of all ages and abilities. • Encourage transportation infrastructure and transportation service concurrency with land development. 	<ul style="list-style-type: none"> • Provide funding mechanisms and explore alternatives to implement multimodal facility development. • Improve agency coordination to provide practical, seamless, and safe facilities for connections between modes. • Design transportation solutions that address issues of distance, safety, and ease of access between bus stops, non-motorized amenities, and land uses. Highlight transit and non-motorized modes as affordable, attractive, simple, and desirable options for travel. • Promote development of park and ride stations at population centers, urban area perimeters, and bypass road intersections.

Modal Integration		
Goals	Objectives	Strategies
<p>2.3. Promote safe connections between modal alternatives.</p>	<ul style="list-style-type: none"> Provide transportation modal options and connections that address safety considerations of all users, especially at-risk population segments (children, elderly, disabled). 	<ul style="list-style-type: none"> Update street design standards to support best practices for pedestrian and bicycle facilities and safety. Coordinate with agencies that support vulnerable populations to better understand concerns of transit riders, bicyclists, and pedestrians.

3. System Preservation

A programmed schedule for regular maintenance, rehabilitation, reconstruction, and replacement of transportation facilities is integral to keep the overall transportation system operating safely and efficiently. Planned assessments, maintenance, and rehabilitation should include surveys of multimodal options.

System Preservation		
Goals	Objectives	Strategies
<p>3.1. Manage transportation assets and optimize investments.</p>	<ul style="list-style-type: none"> Plan and implement maintenance, resurfacing, rehabilitation, and reconstruction to optimize existing transportation system improvements and spending. 	<ul style="list-style-type: none"> Maintain inventory of all transportation assets. Include information on current condition of assets. Maintain systems to monitor and evaluate infrastructure changes so they match regular planning investment cycles. Identify variations in cost for periodic maintenance versus total replacement of facilities to help prioritize projects. Consider total lifecycle costs. Improve use of technology to protect and preserve existing infrastructure. Support a strong policy of size and weight enforcement, including innovative technologies to protect and preserve the existing infrastructure.

System Preservation		
Goals	Objectives	Strategies
<p>3.2. Maintain safe, efficient, complete transportation system for the long term.</p>	<ul style="list-style-type: none"> Plan and implement existing system improvements to effectively sustain the overall transportation system's safe, efficient, and complete operations. 	<ul style="list-style-type: none"> Maintain a schedule for maintenance, replacement, and reconstruction using asset inventory information. Maintain and/or upgrade critical routes (i.e., routes serving as single access to communities with inadequate size/load capacity) and as key emergency evacuation and/or services corridors. Maintain an aggressive Preventative Maintenance Program to extend the useful life of current infrastructure. Improve coordination of system preservation needs with other infrastructure projects and programs. Include impacts related to all hazards mitigation, including global climate change, in assessment of system preservation plans.

4. Security

Ensuring the secure operation of a land transportation system involves multiple agencies working together to achieve common goals of risk management, incident detection, response, clearance, and preparation for and recovery from disasters. Transportation facilities and programs should be planned with a focus on planning for and responding to potential emergencies and threats.

Security		
Goals	Objectives	Strategies
<p>4.1. Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.</p>	<ul style="list-style-type: none"> Reduce travel time during incident responses. Improve incident detection and response capabilities, including access and air and sea modal connections. Improve coordination with emergency managers and major traffic generators and attractors during the planning and execution phases of an incident response. Provide adequate facilities and capacity to support the needs of emergency and evacuation routes. 	<ul style="list-style-type: none"> Promote and develop alternate route options for existing highways and freeways to allow efficient rerouting of traffic away from the primary incident location. Identify and develop strategic evacuation routes that support the multihazard plans. Maintain and upgrade key emergency and access routes (i.e. routes serving as single access to communities with inadequate size or load capacity). Improve public transportation use for emergency evacuation of non-mobile residents during incidents.

Security		
Goals	Objectives	Strategies
	<ul style="list-style-type: none"> • Improve flow of information to the traveling public 	<ul style="list-style-type: none"> • Improve surveillance systems and upgrade detection equipment (such as cameras or loop sensors on roadways) to reduce incident detection time and response time. • Implement multiagency training programs so staff are well educated on protocols and procedures during incident response. Ensure appropriate agencies are involved and alerted to incidents in a timely manner. Ensure that program developers and trainers are qualified to develop appropriate procedures. • Develop a comprehensive outreach mechanism to inform agencies and traffic generators and attractors (e.g. service industries) about incidents. • Enhance multimedia tools to provide information to the traveling public (such as radio and internet information) and information regarding where they can access information (such as "in case of emergency tune to xxx" variable message signs)
<p>4.2. Improve resiliency of the state through the transportation system.</p>	<ul style="list-style-type: none"> • Plan and design for transportation system resilience to maintain efficient and effective connectivity for communities during recovery periods, including resiliency of the utility systems along transportation corridors. 	<ul style="list-style-type: none"> • Establish a forum with the emergency management community, utility providers, and transportation service and infrastructure users to evaluate the transportation system resiliency. • Prioritize roads that provide connectivity in rural areas of the state.

5. Economic Vitality

Transportation options and multimodal facilities need to support planned, sustainable growth in residential, industry, tourism, and cultural and recreational opportunities by reducing travel time, operating costs, travel distance, crashes and logistics inefficiencies.

Economic Vitality		
Goals	Objectives	Strategies
<p>5.1. Promote the expansion and diversification of Hawaii's economy through the efficient and effective use of transportation facilities including movement of people, goods, and services in a safe, energy efficient, and environmentally sound manner.</p>	<ul style="list-style-type: none"> • Maintain and develop an integrated, efficient, and reliable freight system by ensuring connectivity between air, land, and water (harbor) facilities. • Develop an integrated, efficient, and reliable multimodal transportation system that is resilient to impacts of rising oil/energy costs and that will meet future transport demands. • Develop an integrated multimodal system of transportation facilities, services, and information systems that provide for efficient commuter and local resident trips. • Develop an integrated multimodal system of transportation facilities, services, and information so that intrastate, interstate, and international travelers can travel easily for business and recreation. • Improve end-user benefits by reducing operating costs and reducing freight delays. • Maintain and operate an integrated transportation system that supports the economic vitality of all islands, especially locations that can be significantly impacted by small changes in the transportation system (such as Molokai and Lanai). 	<ul style="list-style-type: none"> • Identify and address capacity constrained areas within the transportation system. Prioritize the capacity projects when other strategies are not appropriate. • Consider transportation alternatives that support arrivals and departures of travelers at all hours of the day; and the communication needs of foreign travelers (multilanguage and universal signs). • Encourage and promote concurrent improvements in transportation infrastructure to mitigate impacts of all new developments and maintain an efficient transportation system that supports economic vitality. • Identify specific funding strategies to enhance economic vitality. • Explore financial strategies that examine fees (revenue sources) that cover all transportation modes. • Support efficient and effective movement along the transportation system with traveler information, such as signage and real-time multimedia announcements. • Coordinate schedules and routes of freight transport needs with other transportation system projects to minimize delay and support economic vitality.

6. System Efficiency Management and Operations

Creation of new infrastructure is not always practicable or feasible. Managing our current infrastructure and optimizing its performance improves mobility, reliability and predictability of travel within the existing transportation system and between modal choices.

System Efficiency Management and Operations		
Goals	Objectives	Strategies
<p>6.1. Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.</p>	<ul style="list-style-type: none"> • Improve consistency and predictability of travel time along existing corridors. • Preserve the functional classification system hierarchical operating characteristics. 	<ul style="list-style-type: none"> • Promote transportation demand management and operations techniques, such as carpooling/vanpooling and staggered work hours. • Promote high occupancy facilities to improve mobility within the existing infrastructure. • Promote Intelligent Transportation Systems strategies and implement advanced traveler information devices to monitor traffic operations. Inform users of conditions, and identify locations where avoiding bottlenecks or geometric constraints can improve traffic flow, reduce delay, and improve reliability of the system. • Preserve the function of transportation facilities by implementing appropriate access management requirements based on the roadway's functional characteristics. • Develop connectivity between subdivisions and interior roadways to maintain mobility and function of arterials and major collectors. • Identify changes in demographics, transportation modes, and needs of users on a regular basis.

7. Transportation Access Mobility

Transportation services and infrastructure should be accessible to all potential users. Through policy and planning efforts, services could be improved to equally serve geographic areas and diverse populations.

Transportation Access Mobility		
Goals	Objectives	Strategies
<p>7.1. Provide appropriate and reliable transportation access options statewide to all users.</p>	<ul style="list-style-type: none"> • Provide services and infrastructure to support modal alternatives for all demographics. 	<ul style="list-style-type: none"> • Coordinate between public and private transit and bus service providers to integrate programs, align investments, and provide affordable, streamlined services. • Coordinate multimodal infrastructure and transit service improvements with human service agencies to determine needs of underserved populations, such as disabled, elderly, and environmental justice populations.
<p>7.2. Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves environmental justice populations).</p>	<ul style="list-style-type: none"> • Prioritize projects equitably to serve all modes and demographics, with attention to underserved communities. 	<ul style="list-style-type: none"> • Provide constant and continuous information broadly to the public about expenditures on transportation infrastructure and services, and operations performance. • Create a monitoring system to evaluate transportation projects and programs against the goals and standards that they were originally developed to achieve. Develop strategies and tools to support corrective actions. • Promote transparent decision processes with broader citizen engagement and oversight. This can be accomplished by establishing subarea groups, advisory boards, or committees comprised of a broad spectrum of representatives for residents including underserved populations (such as disabled, elderly, and environmental justice). <p>Support paratransit programs that meet the needs of the disabled and elderly population.</p>

8. Safety

Safety for users of all modes can be improved through engineering (for example, evaluation of areas that have highest rates of crashes and by designing roadways with adequate sight distance for appropriate speeds), education (media campaigns), and enforcement (red-light cameras, fines).

Safety		
Goals	Objectives	Strategies
<p>8.1. Maintain a safe transportation system for all land transportation modes.</p>	<ul style="list-style-type: none"> • Address transportation safety through a mixture of education, enforcement and engineering solutions. • Reduce the number traffic related fatalities. • Reduce the number of collisions and crashes involving serious injuries and fatalities for all land transportation modes. 	<ul style="list-style-type: none"> • Coordinate with the Strategic Highway Safety Plan to implement plan recommendations and monitor performance, including: <ul style="list-style-type: none"> – Photo enforcement – Prioritization of nonmotorized needs – Improved signage – Increased design considerations for safety of all modes (including temporary traffic control plans) – Intelligent Transportation Systems – Improved data reporting, assessment, and availability of information – Impaired driving, motorcycle/moped, pedestrian and bicycle educational programs prioritizing young high risk new operators – Increased bicycle and pedestrian educational programs – Improved civil and criminal fines or penalties for fatalities or serious injuries – Increased enforcement – Safe enforcement areas – Increased severity of sentencing for convicted repeat offenders thereby keeping them from operating a motor vehicle while in an impaired condition • Develop solutions that reduce or prevent head-on collisions on existing infrastructure as well as new facilities.

Safety		
Goals	Objectives	Strategies
		<ul style="list-style-type: none"> • Develop improved access for emergency service to reduce response time and evacuation time. • Develop roadside features that enhance safety of the transportation system. • Promote legislation, enforcement and education to reduce the risk of distracted transportation system users (all modes). • Promote education and enforcement programs to reduce injury risk to pedestrians and passengers with disabilities. • Develop transportation solutions that recognize and uphold the goals and strategies of safety programs supported by FHWA and AASHTO.
<p>8.2. Improve safety of the community through connectivity of the transportation infrastructure.</p>	<ul style="list-style-type: none"> • Provide emergency access to all parts of the state, especially in locations with only one road in and out. 	<ul style="list-style-type: none"> • Consider using other roads including military access roads and plantation or cane haul roads as alternatives during an emergency especially in a weather related emergency. Identify which agency or agencies would be responsible for implementation. (Agreements with individual land owners and agencies are needed.)

9. Additional Goals, Objectives, and Strategies

Initial discussions with stakeholders have identified 'other' goals that would benefit the long-term land transportation planning, delivery of projects and services.

Additional Goals, Objectives, and Strategies		
Goals	Objectives	Strategies
<p>9.1. Obtain sufficient and specific transportation funding.</p>	<ul style="list-style-type: none"> • Create and implement a funding mechanism that would cover the costs of providing a safe, efficient, sustainable transportation system into the future. • Obtain diverse funding and ensure that funding set aside for transportation is used only for transportation. • Coordinate and communicate with the counties on future transit corridors 	<ul style="list-style-type: none"> • Supplement current transportation funding by identifying and securing diverse funding sources to support the multimodal transportation system, e.g., public and private partnerships. • Identify and implement user fees that equitably spreads the cost burden over all modes of transportation without impacting environmental justice populations. • Reduce the deficit in state transportation facilities with increased taxes specifically earmarked for Capital Improvements or Maintenance. • Support policy that requires new development/growth to fund their impacts on transportation facilities (impact fees).
<p>9.2. Optimize project delivery.</p>	<ul style="list-style-type: none"> • Improve coordination of plans and resources. • Improve efficiency of planning and delivery of projects. 	<ul style="list-style-type: none"> • Plan, develop and maintain transportation infrastructure within programmed budget amounts. • From planning through operations, improve coordination and communication between multiple departments, public citizen groups and agencies to address needs and resources efficiently. • Provide communications between multiple departments, public citizen groups and agencies related to status of projects. • In areas where multiple state and/or federal agencies have authority, create a lead agency to manage overall project reducing delays, redundancies and inefficiencies. Develop procedures and protocol to monitor compliance, cooperation, communication and efficiency. • Use transportation funds efficiently, and maximize revenues.
<p>9.3. Provide ongoing planning to assess and address statewide needs.</p>	<ul style="list-style-type: none"> • Monitor, evaluate and develop solutions, and adjust program goals on a continuing periodic coordinated basis. 	<ul style="list-style-type: none"> • Continue to implement the 3-C planning process (comprehensive, cooperative and continuing).

Additional Goals, Objectives, and Strategies		
Goals	Objectives	Strategies
<p>9.4. Coordinate use of public right-of-way with other public service providers.</p>	<ul style="list-style-type: none"> Continue the safe accommodation and installation of utility facilities within the right-of-way or easement along state highways and federal-aid county highways. 	<ul style="list-style-type: none"> Coordinate with utility service providers to work together in establishing location, design, and methods for the possible accommodation and installation of utility facilities along state highways and federal aid county highways. Considerations should include, but not be limited to safety, future widening and site specific issues. Coordinate and communicate transportation and utility planning efforts to enable development of a coordinated transportation and utility system.



Appendix D

*Existing and Future Baseline Assumptions
and Conditions*

Statewide and Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai

District of Hawaii: Existing and Future Baseline Assumptions and Conditions

PREPARED FOR: State of Hawaii Department of Transportation Regional Long-Range Land Transportation Plan, Technical Advisory Committee, and Stakeholder Advisory Committee

PREPARED BY: Terry Yuen/CH2M HILL
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DATE: Revised March 2014

Introduction

The purpose of this memorandum is to present an overview of existing and future baseline land transportation system conditions within the District of Hawaii. The memorandum focuses on regional transportation infrastructure and travel demands, including descriptions of the transportation system, land use, socioeconomic characteristics, and system performance.

Existing Conditions

Existing Transportation System

The existing transportation system within the Island of Hawaii consist of roadways, paths, and transportation services that provide for the needs of multimodal users: cars, freight, transit, pedestrians, and bicyclists. The transportation system includes both state and county facilities and is the means by which the State of Hawaii Department of Transportation (HDOT) Highways Division mission is upheld.

Existing Roadway System

The roadway system is the backbone for moving both people and goods around the Island of Hawaii. All modes of land transportation use the roadway system.

The existing roadway system within the Island of Hawaii consists of arterial, collector, and local roadways.

The Mission of the HDOT Highways Division is to provide a safe, and efficient and accessible highway system through utilization of available resources in the maintenance, enhancement, and support of land transportation facilities.

- **Arterial** – roadways of regional importance that are intended to serve high volumes of traffic traveling relatively long distances. An arterial is intended to primarily serve through traffic and have a degree of access control.
- **Collector** – roadways that provide for traffic movements between arterials and local streets and carry moderate traffic volumes over moderate distances. Collectors may also provide direct access to abutting properties.
- **Local** – roadways that are intended to provide access to abutting properties. They tend to accommodate lower traffic volumes, serve short trips, and provide connections to collector streets.

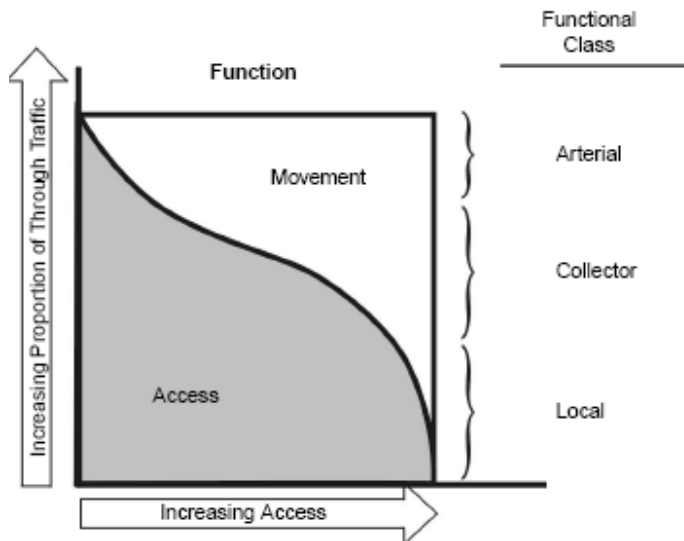
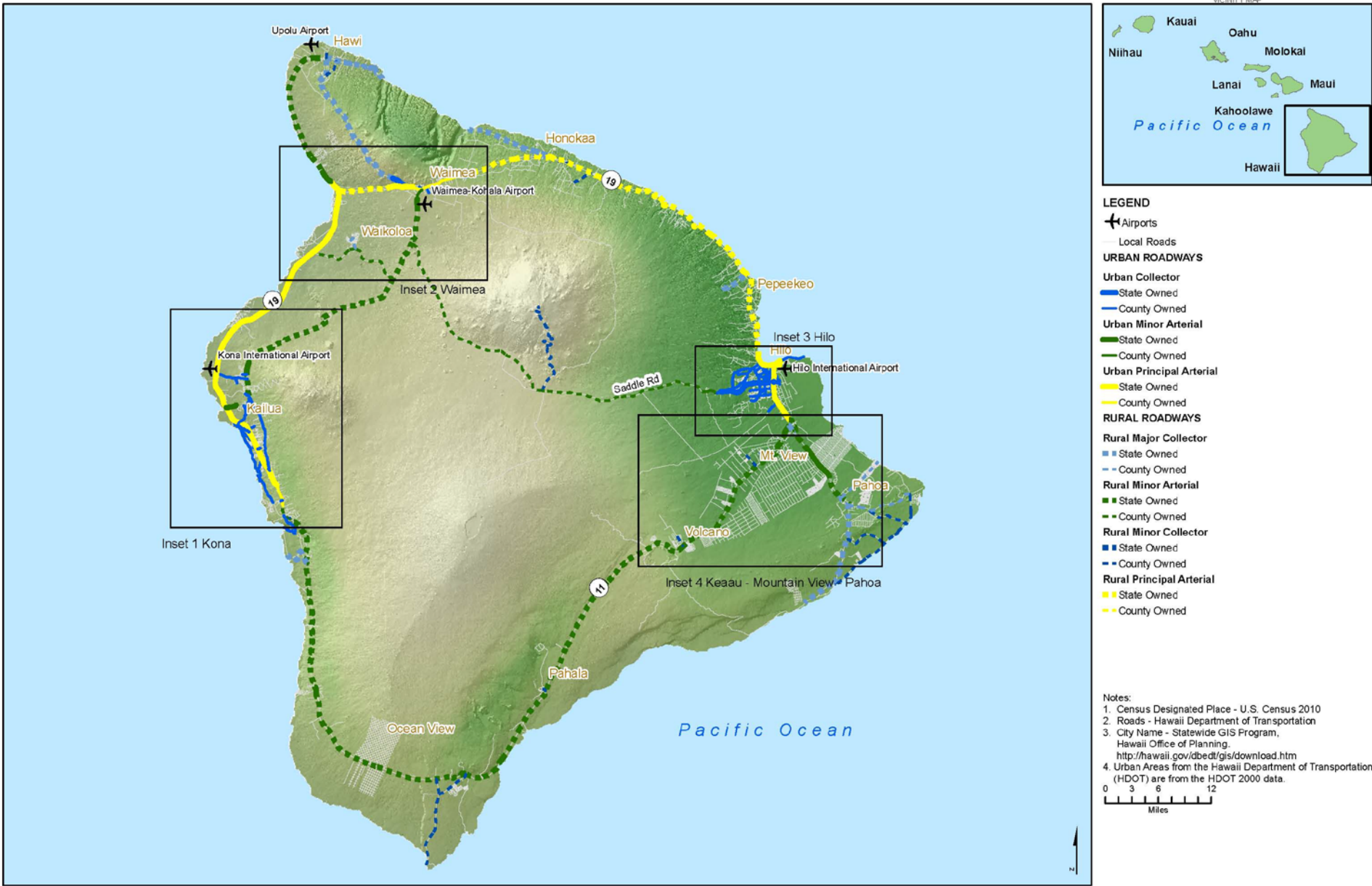


FIGURE 1
Existing Roadway System Classifications
Transportation Research Board, 2003

The Transportation Research Board (2003) shows the relationship between movement and access for the three roadway types on Figure 1. Arterials are characterized with greater emphasis on movement of traffic, while local roadways have higher emphasis on property access.

The Regional Long-Range Land Transportation Plan will encompass solutions that are on the federal-aid roadway system. The federal-aid system includes roadways under both state and Hawaii County jurisdiction classified as collectors and arterials. Figure 2 depicts the federal-aid system for each type of roadway facility. Table 1 summarizes the number of centerline miles and the number of lane miles of each type of facility on Hawaii. Centerline miles represent the length of the roadway as measured along the center of the road. Centerline miles do not take into account direction of travel, pavement width, or the number of travel lanes at any particular location. Lane miles are measured by direction and include the length of any travel lane along a roadway segment.



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FIGURE 2
Existing Functional Classifications
HDOT, 2012

CH2MHILL

TABLE 1
Miles of Functionally Classified Roadways – Hawaii

Classification	Centerline Miles	Lane Miles
Principal/Major Arterials	129	292
Minor Arterials	177	364
Collectors	482	972
Total	788	1628

HDOT, 2009

Hawaii County’s residents and communities are mainly located on the perimeter of the island. These communities are primarily connected via a belt road that circles the island and is made up of primary and minor arterial segments. This belt road connects to collector roads and minor arterials that provide local access. Due to the unique geography of the Island of Hawaii, there is little access across or through the island.

Saddle Road is a rural minor arterial situated between the island’s two major volcanoes, and provides access between Hilo and the north Kona/Waimea area. This road is the sole alternative to the belt road system on the northeast perimeter of the island. Because there is little access through the island, vehicle trips on Hawaii between major centers such as Hilo and Kona tend to be long (greater than 2 hours on average).

On the north side of the island, between south Kona and south Hilo, a continuous segment of primary arterial is provided via Highway 11 (Hawaii Belt Road) and Highway 19 (Hawaii Belt Road and Queen Kaahumanu Highway). This primary arterial connects to minor arterials and collector roadways, including Akoni Pule Highway and Kohala Mountain Road, to provide access to more rural areas of the island, such as Hawi on the northern tip of the island.

On the south side of the island between Kona and Hilo, Highway 11 (Hawaii Belt Road) is designated as a minor arterial. This minor arterial is the sole access to rural communities such as Pahala, Naalehu, and Ocean View.

Existing Bikeway System

Bicycles are increasingly being recognized not only as a recreational activity, but a viable transportation mode. The *Bike Plan Hawaii, A State of Hawaii Master Plan Abridged Version* (HDOT, 2003) summarizes the multifaceted benefits of bicycling, not only as a means of transportation, but also related to health, economics, community, and the environment.

Bicycle facilities can generally be described as any improvement or provision made by public agencies to accommodate bicycling. The existing bicycle facilities within the Island of Hawaii consist primarily of three types; paths, bike lanes, and signed shared roadways.

The American Association of State Highway and Transportation Officials (1999) defines these facilities as:

- **Paths or Shared-use Paths** – a bikeway that is physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared-use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users.

- **Bike Lanes** – a portion of a roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.
- **Signed Shared Roadways** – a shared roadway which has been designated by signing as a preferred route for bicycle use. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders.

The Bike Plan Hawaii provides an inventory of the existing and planned bicycle system on the Island of Hawaii. Figure 3 shows these facilities. The solid lines on the map represent the existing bicycle facilities. The Island of Hawaii has approximately 27 miles of designated existing bicycle facilities.

- **Paths or Shared-use Paths** – 6 miles
- **Bike Lanes** – 3 miles
- **Sign Shared Roadways** – 18 miles

Benefits of Bicycling

Transportation	Bicycling is an easy way to complete short trips, while helping to reduce traffic congestion and parking requirements. For people with limited transportation options – those without a driver’s license or motor vehicle – bicycling can provide an important transportation option.
Health	Bicycling is an excellent form of physical activity to prevent and/or control detrimental health conditions.
Economics	Bicycling is business – retailers, repair shops, rentals and organized tours, and sporting events, all generate income. In addition, bicycling has the potential to attract a growing number of eco-tourists, people who want a more active vacation experience.
Community	Bikeways can help define a community’s character and promote more social interaction among people who are out and about in their communities.
Environment	Bicycling produces no pollution and doesn’t consume fossil fuels. The most frequent, comfortable, and practical trips for bicyclists – those under five miles – produce the greatest environmental benefits, since trips shorter than five miles are the least fuel efficient and produce the highest emissions per mile.

Source: HDOT, 2003

Existing Pedestrian System

Pedestrian facilities are a critical part of the transportation system. For every trip that is made, a portion occurs as pedestrian travel. The benefits of walking are similar to those noted for bicycling; transportation, health, economics, community and the environment. The Statewide Pedestrian Master Plan (HDOT, 2013) developed a stakeholder driven vision for the pedestrian system that promotes the pedestrian mode of transportation as well as protects those that are using the pedestrian system.

Pedestrian facilities can generally be described as any infrastructure that is designed specifically for use by a pedestrian. These include sidewalks, crosswalks, and paths.

The Statewide Pedestrian Master Plan provides information on the existing pedestrian system. Figure 4 shows the existing state pedestrian system.

Sidewalks on the Island of Hawaii can be found in business and commercial areas around the island. In Hilo several short sections of highway have sidewalks on one side including Bayfront Highway/Kamehameha Avenue east of Kanoelehua Avenue, and Kanoelehua Avenue between Kamehameha Avenue and Puainako Street. Sections of Kalanianaʻole Avenue, Puainako Street, and Keeau-Pahoa Road in Hilo also have sidewalk on one side of the street. In Kailua-Kona, sidewalks are provided on one side of Palani Street between Queen Kaahumanu Highway and Kuakini Highway, as well as along a portion of Kealakehe Parkway approaching Queen Kaahumanu Highway.

The belt road around Hawaii's perimeter does not generally have sidewalk, but portions of Hawaii Belt Road do have sidewalk on one side of the highway in communities such as Waimea and Naalehu, as well as on segments approaching Kailua-Kona south of Honaunau. Honokaa-Waipio Road in Honokaa has a short section where sidewalk is provided on one side of the road.

There is also a network of Na Ala Hele recreational and park walking trails throughout the island districts.

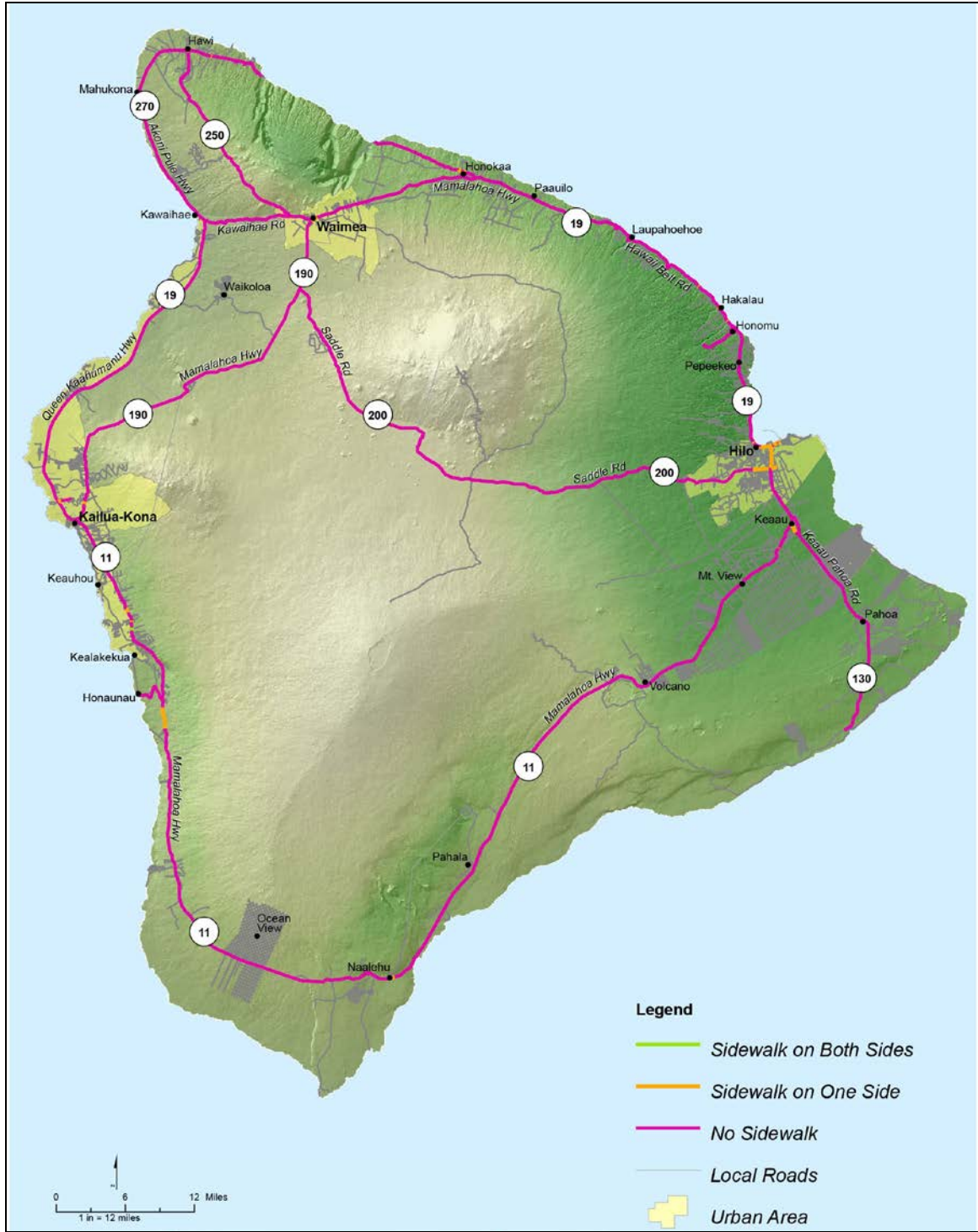


FIGURE 4
Existing State Pedestrian System
HDOT, 2013

Existing Travel Demand Management/Transportation Systems Management

Travel Demand Management (TDM) is a term used to describe strategies that reduce travel demands or redistribute travel demands to lessen impacts of peak periods. TDM measures may include measures to encourage people to switch to higher occupancy modes, such as public transit, vanpools, and carpools. TDM may also encourage people to utilize non-motorized modes of travel, such as walking and bicycling.

Transportation System Management (TSM) strategies enhance the capacity of the existing transportation system through operational improvements. TSM may include contra flow lanes, high-occupancy vehicle lanes, and Intelligent Transportation Systems.

The Hawaii transit system is described in the next section. There are currently no active TDM or TSM programs or operations on the Island of Hawaii, although it is the County of Hawaii

County of Hawaii General Plan policy includes:

- Considering the development of alternative means of transportation, such as mass transit, bicycle, and pedestrian systems, as a means to increase arterial capacity.
- Supporting development of an efficient transit route between east and west Hawaii.
- Enhancing bus services and bicycle paths.

Source: Hawaii Planning Department, 2005

General Plan policy to consider alternatives to roadway capacity increases. Alternatives such as increased transit utilization for example could be considered in the future.

Existing Public Transit System

Public transit provides an option and opportunity for personal mobility for anyone, regardless of age, income, social or physical status. Additionally public transit benefits overall quality of life through reduced traffic congestion and improved air quality. It also provides a modal alternative for those who are unable to or choose not to drive.

The *County of Hawaii General Plan* (County of Hawaii Planning Department, 2005) policy considers development of alternative means of transportation in the form of mass transit (in addition to bicycle and pedestrian facilities) to increase roadway capacity. The plan policy also supports an efficient transit route between the east and west sides of the island.

The Hawaii County Mass Transit Agency currently provides public transportation around the island via the Hele-On Bus at a fare of \$1.00 for all island-wide scheduled routes. In addition, the Transit Agency offers a Shared Ride Taxi program which provides door to door transportation service for \$2.00 per ride within 9 miles of the urbanized areas of Hilo and Kona.

The public transit system includes bus service and stops, paratransit services, and park-and-ride facilities west of Hilo at the intersection of Prince Kuhio Boulevard and Maile Drive and east of Hilo at Makuu Farmer’s Market (Pahoa side entrance).

Public Transit Service consists of ten bus routes, providing service within Hilo, the Kohala resorts, and Kona. Service also includes cross-island routes that connect the Kohala resorts/ Waimea/ Kona areas with Hilo and the east coast of the island. Commuter Service consists of five commuter routes. The Intra Hilo Kaumana route, Kau/Volcano/Hilo route, North Kohala/ South Kohala route, North Kohala/Waimea/Kailua-Kona route, and the Pahala/Kona/South Kohala routes have one run in the morning and one in the afternoon in the major commute

direction. Persons with disabilities may ride buses at no charge with a Hele-On identification card. Figure 5 shows the existing service route areas.

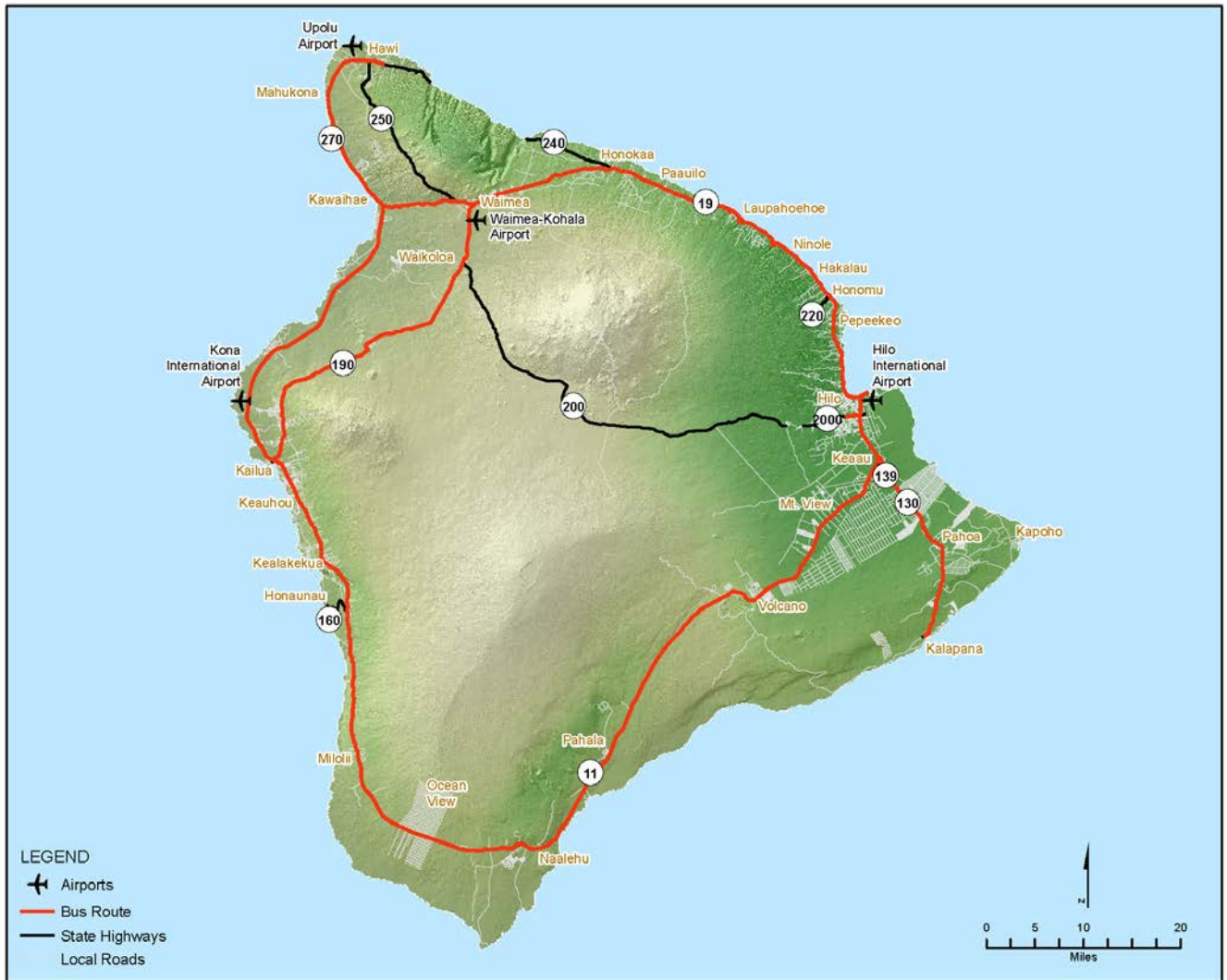


FIGURE 5
Existing Transit Routes
HDOT, 2013

Existing Freight System

Freight mobility is critical to the economic vitality of the islands. Although there are no specified freight routes, freight activities are concentrated around the commercial harbors and airports and use many of the arterial roadways to transport goods to market throughout the islands.

The Island of Hawaii has two commercial harbors. Hilo Harbor is located on Kuhio Bay in Hilo. The main accesses to Hilo Harbor occur from Kumau Street and Kuhio Street, both of which connect to Kalaniana'ole Avenue. Ancillary access to the harbor is also available along Radio Bay Access Road. From the harbor, freight is transported to businesses and industrial areas within Hilo via a network of local roadways. From Hilo, freight vehicles use Hawaii Belt Road

(Highway 11 to the south and Highway 19 to the north) to distribute goods to communities around the island.

Kawaihae Harbor is located on the northern end of the Kohala coast. The main access to Kawaihae Harbor occurs from Akoni Pule Highway/Kawaihae Road. The Hawaii Belt Road and Queen Kaahumanu Highway serve as the primary routes for freight vehicles carrying goods from Kawaihae Harbor to industrial, business, and resort areas on Hawaii.

Kona International Airport and Hilo International Airport accommodate a relatively small percentage of the island's freight tonnage. Transport vehicles use Hawaii Belt Road (from Hilo) and Queen Kaahumanu Highway (from Kona) to distribute cargo throughout the island.

Existing State Land Use Districts

The State Land Use Commission (LUC) was developed to be responsible for preserving and protecting Hawaii's lands. The LUC establishes the district boundaries statewide. The districts are comprised of Urban, Rural, Agricultural, and Conservation. These district characteristics are described below, as defined by the State of Hawaii LUC. The land use districts outline allowable development and constraints that affect transportation demands, infrastructure, and services.

The **Urban District** generally includes lands characterized by "city-like" concentrations of people, structures, and services. This District also includes vacant areas for future development. Jurisdiction of this district lies primarily with the respective counties. Generally, lot sizes and uses permitted in the district area are established by the respective county through ordinances or rules.

Rural Districts are composed primarily of small farms intermixed with low-density residential lots with a minimum size of one-half acre. Jurisdiction over Rural Districts is shared by the Commission and county governments. Permitted uses include those relating or compatible to agricultural use and low-density residential lots. Variances can be obtained through the special use permitting process.

The **Agricultural District** includes lands for the cultivation of crops, aquaculture, raising livestock, wind energy facility, timber cultivation, agriculture-support activities (that is, mills, employee quarters, etc.) and land with significant potential for agriculture uses. Golf courses and golf-related activities may also be included in this district, provided the land is not in the highest productivity categories of the Land Study Bureau's detailed classification system. Uses permitted in the highest productivity agricultural categories are governed by statute. Uses in the lower-productivity categories are established by the Commission.

Conservation Districts are comprised primarily of lands in existing forest and water reserve zones and include areas necessary for protecting watersheds and water sources, scenic and historic areas, parks, wilderness, open space, recreational areas, habitats of endemic plants, fish and wildlife, and all submerged lands seaward of the shoreline. Conservation Districts also include lands subject to flooding and soil erosion. Conservation Districts are administered by the State Board of Land and Natural Resources and uses are governed by rules promulgated by the State Department of Land and Natural Resources.

TABLE 2
LUC Land Use Districts – Total Acreage

Island	Total Area ^a	Classification by State Land Use Commission ^b			
		Urban	Conservation	Agricultural	Rural
Hawaii ^c	2,573,400	53,722	1,304,347	1,214,040	1,291

^a These totals differ somewhat from the official figures based on measurements by the Geography Division of the U.S. Bureau of the Census.

^b For definitions, see Hawaii Revised Statutes, Section 205-2.

^c May be revised, pending updates of county records.

State of Hawaii Department of Business, Economic Development and Tourism, 2011

More than half of Hawaii’s land use consists of conservation district. Agricultural districts comprise approximately 47 percent of the island. Urban land use districts make up 2 percent of the land area, and are concentrated within the Hilo, Kona, and the Kohala coast resort areas. Rural districts are also limited in size, comprising less than 1 percent of the island.

Figure 6 shows the State Land Use Districts for Hawaii.

Existing Community Development Plan Areas

There are seven Community Development Plan areas in Hawaii County: Kona, North Kohala, South Kohala, Puna, Kau, Hamakua, and Hilo. Of the seven areas, four Community Development Plans have been drafted: Kona, North Kohala, South Kohala, and Puna. Kau, Hamakua, and Hilo do not have Community Development Plans.

Each of the Community Development Plans reflects current and anticipated conditions, and advances planning goals, objectives, policies, and implementation considerations for the designated community.

The Community Development Plans provide specific recommendations to address the goals, objectives, and policies contained in the General Plan, while recognizing the values and unique context of the individual community. The urban/town and land use related goals and objectives of the community plans are summarized in Table 3.

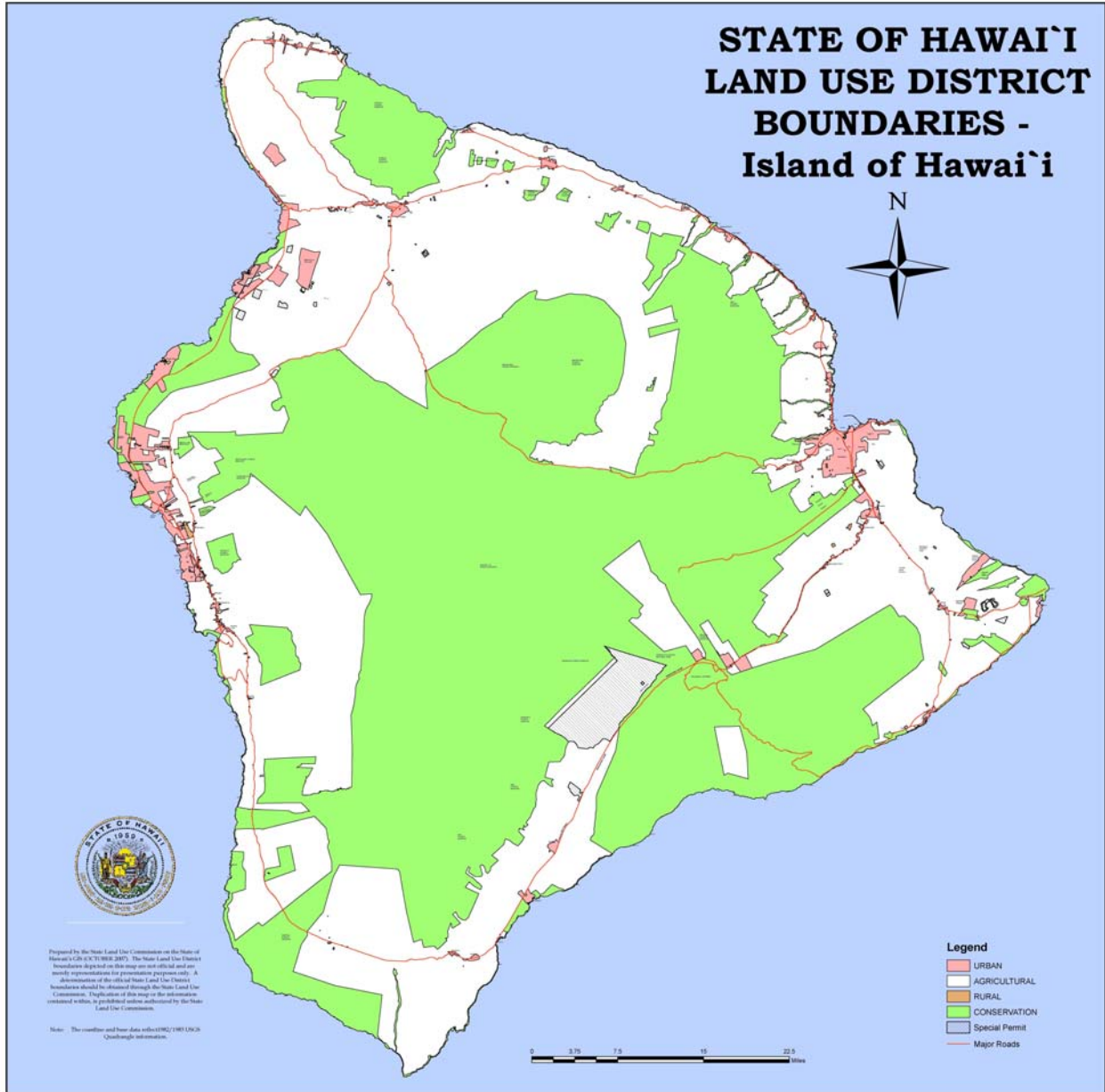


FIGURE 6
Existing State Land Use District Boundaries
State of Hawaii LUC, 2007

TABLE 3
Community Plan Land Transportation-related Goals

Community Plan	Urban/Town and Land Use Goals
Kona	<p>Develop an efficient, safe, and attractive multimodal transportation system integrated with land use planning that allows movement around and through Kona with minimal reliance on the automobile.</p> <p>Encourage walking, biking, transit, and other nonvehicular modes of travel.</p> <p>Revise current street design standards to improve design of facilities that accommodate the disabled and pedestrians or bicycles.</p> <p>Develop primary and secondary transit routes to improve connectivity, and serve transit-oriented land use developments.</p> <p>Develop a system of interconnected roads that provide alternative routes for automobiles while maintaining mobility on higher functioning roadways.</p>
North Kohala	<p>Maintain rural infrastructure.</p> <p>Provide for adequate drivable (mauka-makai) public access to coastal and mountain areas.</p> <p>Revamp, repair and/or replace aging or damaged infrastructure; improve emergency preparedness; and prioritize and implement future improvements to public facilities and services.</p> <p>Direct growth to areas within and near existing town centers to preserve the district's open space, cultural resources and promote agriculture.</p>
South Kohala	<p>Provide for the transportation and circulation needs of the South Kohala Community and for commuters.</p> <p>For new major roads, incorporate Complete Street standards.</p> <p>Establish bicycle, pedestrian and equestrian travel ways to link up the communities within the District, and establish alternate travel ways within the individual communities.</p> <p>Identify and establish transit corridors for future mass transit service within the district.</p>
Puna	<p>Increase mass transit options and complement the development of the villages with transit service. For example: convert bus routes to hub and spoke service, coordinate transit service with paratransit and school transportation, and provide park-and-ride lots.</p> <p>Provide adequate emergency and evacuation routes.</p> <p>Provide pedestrian and bicycle-friendly roads.</p> <p>Provide highways that have design features that improve safety, particularly at intersections. Provide highways that are aesthetically pleasing and compatible with Puna character. Allow for increased county and community influence over highway planning and design decisions.</p> <p>Provide safe walking and bicycling routes to schools, parks and bus stops, and safe crossings on Highways 130 and 11.</p> <p>Manage growth by encouraging a more efficient, environmentally sustainable land use pattern, (i.e., village centers), each providing varying degrees of services and amenities, with all addressing the stop of sprawl development.</p> <p>Reduce the percentage of single-occupant vehicles during peak commute periods and the percentage of residents who commute to employment and services outside of Puna.</p>

County of Hawaii Planning Department, 2008

A long-range plan for the downtown Hilo area has been developed in the *Envision Downtown Hilo 2025: A Community-Based Vision and Living Action Plan* (County of Hawaii Planning

Department, County of Hawaii County Council, 2010). This plan has developed a vision and subsequent short-term implementation plan to address the following focus areas:

1. Creating Economic Vitality
2. Preserving Our Environment
3. Strengthening and Sustaining Our Community
4. Enhancing Education, Culture, and the Arts
5. Promoting Health and Safety
6. Managing Growth

Existing Socioeconomic Conditions

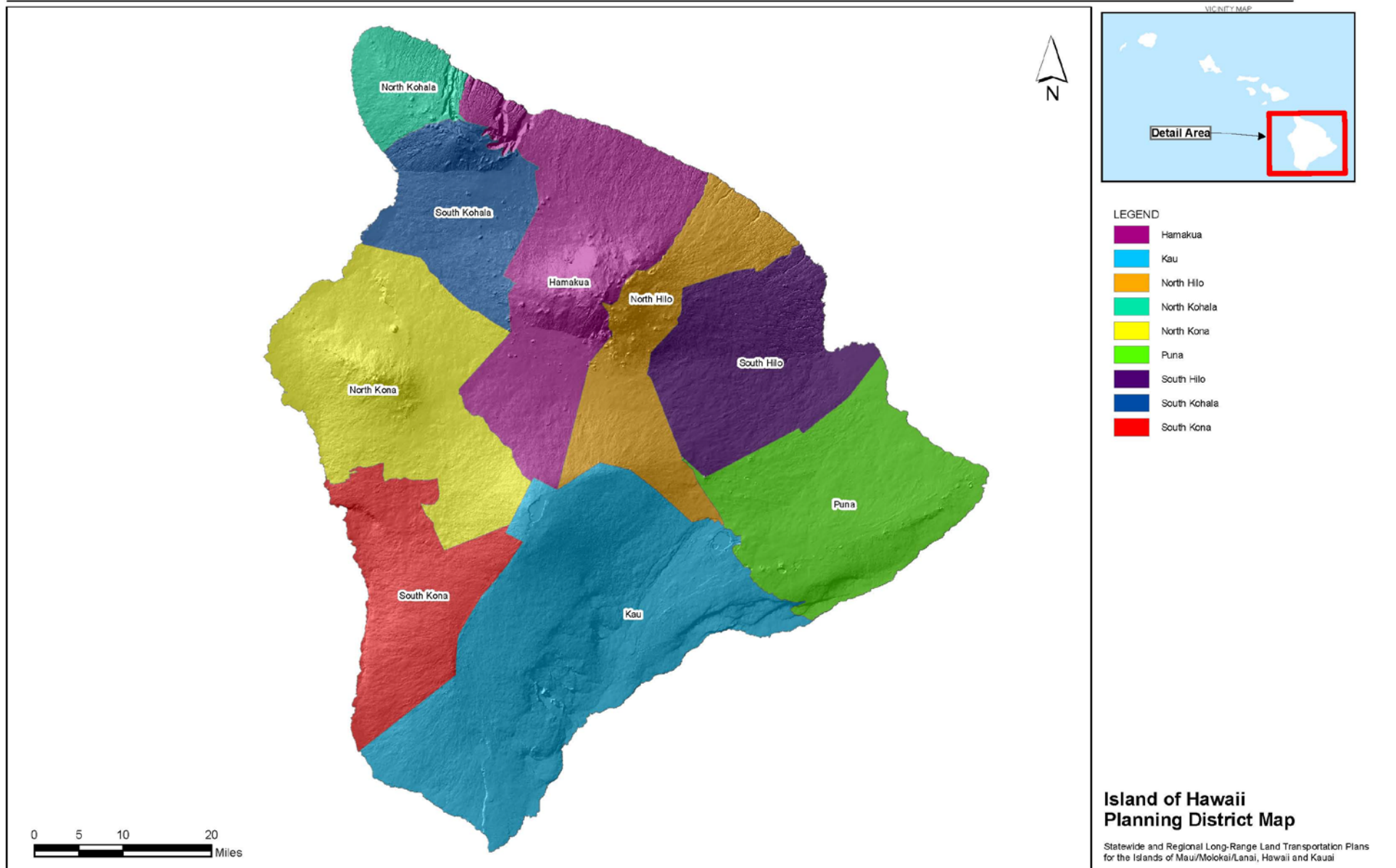
Socioeconomic characteristics of the islands also influence transportation demands, and need to be considered in the provision of transportation infrastructure and services. The socioeconomic data provide information on trip productions and attractions. Trips are typically produced from households. Trip attractions are related to activities such as employment, schools, shopping, and recreation.

The methodology used to develop and process the 2007 socioeconomic data are contained in Attachment 1. The raw data for households, employment, schools, visitor accommodations, visitor attractions, airports, and harbors have been processed to prepare input for the travel demand modeling and traffic forecasting for the Island of Hawaii.

Population

Table 4 summarizes the population within Hawaii County by districts. More than half of the island's population resides on the east side of the island within communities in the South Hilo district (28 percent) and Puna district (24 percent). Approximately one quarter of the population resides in the North and South Kona districts. The North Hilo district is the least populated and includes just one percent of the island's total population. The Planning Districts for the Island of Hawaii are shown on Figure 7.

In the Kau and Puna districts of Hawaii County, including the towns of Naalehu and Pahoa, up to 40 percent of the population lives below the poverty line. The poverty threshold is set nationwide through the United States Census and is based on the number of individuals in a household and the yearly annual income of the household. The percentage of the population living below the poverty line is estimated from census data and reported by the American Community Survey. The poverty low-income level is adjusted annually to reflect inflation. Within the South Kona and Hamakua districts, between 10 and 20 percent of the population is considered low income and live below the poverty line, while less than 10 percent of the Kohala coast population is considered below the line. Waimea town and a concentrated area of north Hilo are the only locations on the island where less than 5 percent of the population is categorized as living below the poverty line.



Last updated February 22, 2012

CH2MHILL

FIGURE 7
Existing State Planning District Boundaries
County of Hawaii Planning Department, 2012

TABLE 4
Existing Population

Planning District	Population	Percent of Total
North Kohala	5,600	3%
South Kohala	16,790	10%
Hamakua	6,090	3%
North Hilo	1,910	1%
South Hilo	47,620	28%
Puna	42,380	24%
Kau	7,900	5%
North Kona	35,780	21%
South Kona	8,970	5%
Total	173,040	100%

CH2M HILL, 2012a (Population is estimated based on persons per household statistic from 2000 and 2010 Census and number of housing units from Hawaii County Assessor Data, March/April 2011).

Households

Table 5 summarizes the households within Hawaii County by districts. The distribution of households on the island is similar to the population distribution with the majority of households located in either the South Hilo or Puna districts. The North Hilo, Hamakua, and North Kohala districts contain the fewest number of households compared to other planning districts on the island. Figure 8 illustrates the number of households throughout the island of Hawaii.

TABLE 5
Existing Households

Planning District	Households	Percent of Total
North Kohala	1,980	3%
South Kohala	5,940	10%
Hamakua	2,160	3%
North Hilo	690	1%
South Hilo	17,670	28%
Puna	14,960	24%
Kau	3,000	5%
North Kona	13,050	21%
South Kona	3,410	5%
Total	62,860	100%

Hawaii County Assessor Data, 2011

Employment

There were approximately 68,350 jobs in Hawaii County in 2007 as summarized in Table 6. Employment was most concentrated in the Hilo and Puna area, and in the Kona districts. Approximately 25,440 jobs were in service occupations and 9,400 jobs were in retail occupations.

TABLE 6
Existing Employment

Planning District	Employment	Percent of Total
North Kohala	780	1%
South Kohala	10,600	16%
Hamakua	1,010	1%
North Hilo	160	1%
South Hilo	27,050	40%
Puna	4,350	6%
Kau	920	1%
North Kona	21,340	31%
South Kona	2,140	3%
Total	68,350	100%

Hawaii Department of Labor and Industrial Relations, 2007

Military employment (for active-duty, reservist, and civilian employees) accounts for less than 1 percent of the island's total employment positions. These positions are considered public service occupations, and employees are located at the Pohakuloa Training Area, Kilauea Military Camp, at recruiting facilities, or at various supporting facilities throughout the island. Saddle Road is the only access to the Pohakuloa Training Area, and because of its remote location, the majority of traffic (heavy military equipment, supplies, and employees from either side of the island) on the Saddle Road is destined for the training area. Figure 9 illustrates the number of jobs throughout the Island of Hawaii.

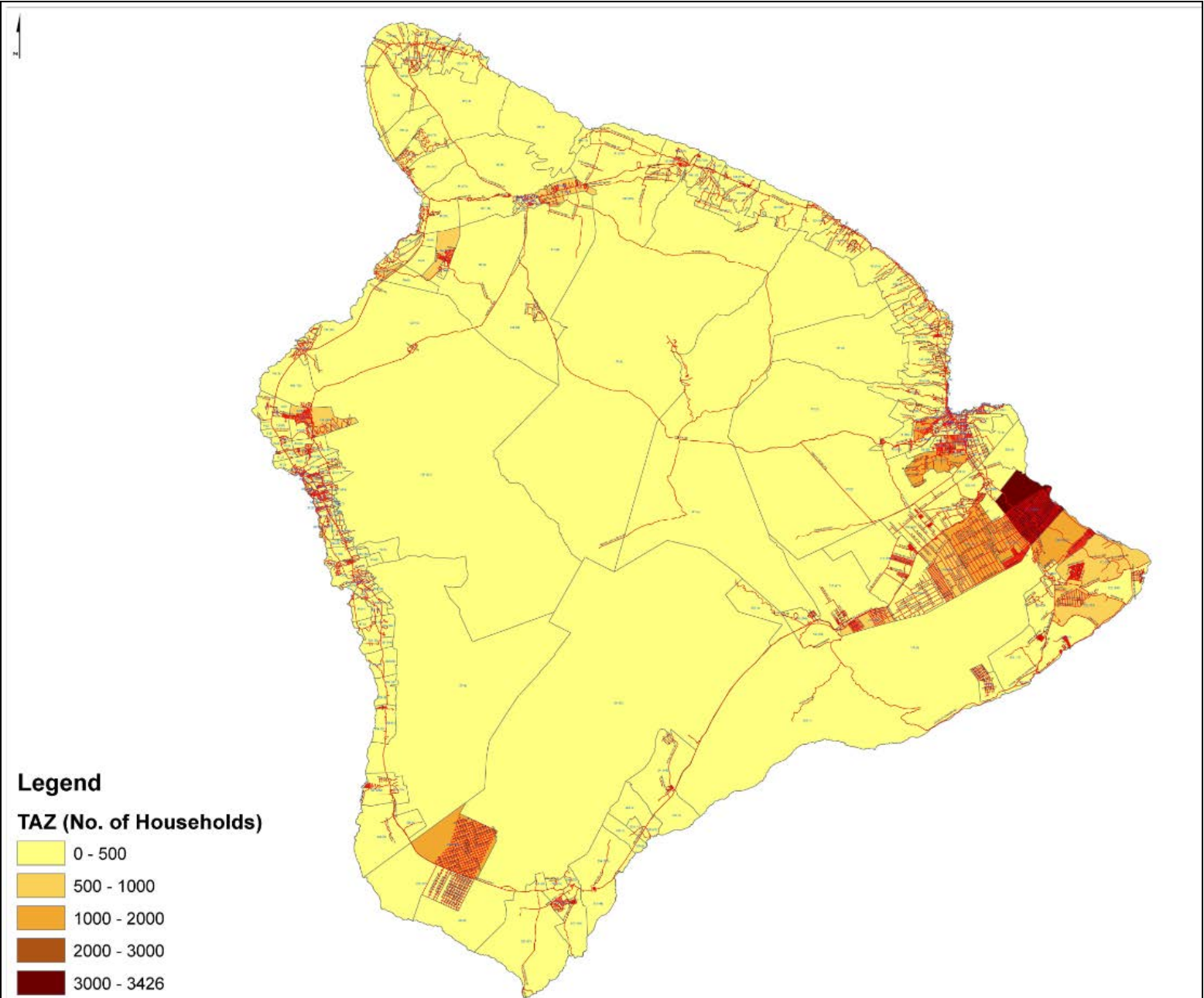


FIGURE 8
Existing Households

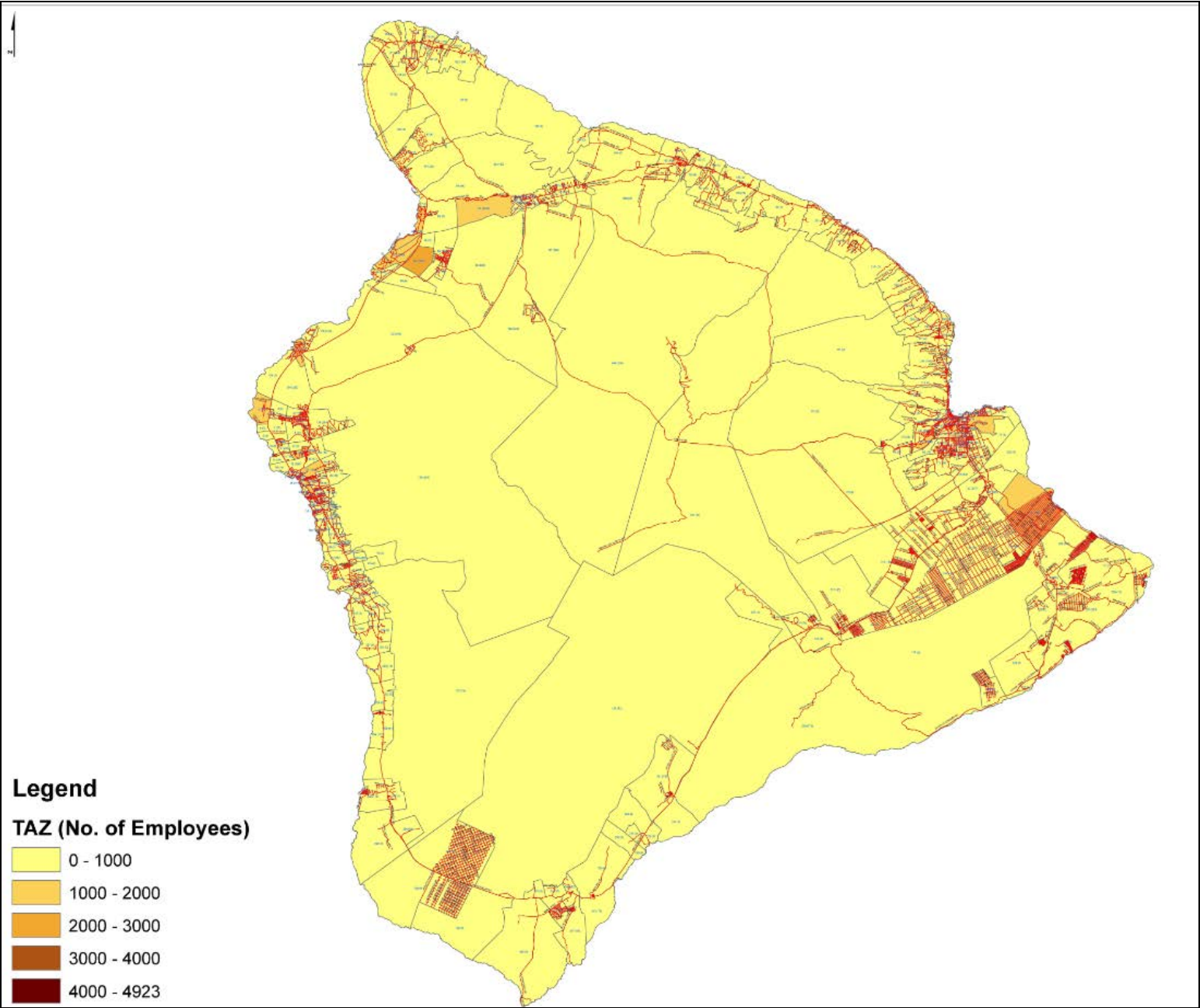


FIGURE 9
Existing Employment

Visitor Industry

Per the Hawaii County General Plan, the visitor industry is the island's leading economic sector. The airports within the county conveyed nearly five million air passengers during 2007. The two main airports of Hawaii accommodated nearly 100 percent of these passengers, with 3.2 million passengers using the Kona International Airport and 1.7 million passengers using the Hilo International Airport facilities. Waimea-Kohala Airport accommodated 2,290 passengers (HDOT, 2008).

Hilo Harbor also services the visitor industry through cruise ship accommodations. The HDOT Harbors Division estimated that nearly 499,330 cruise ship passengers were accommodated at Hilo Harbor in 2007.

In 2007, there were over 11,060 visitor accommodations on the Island of Hawaii. The areas characterized by the greatest number of hotel rooms were located in Kona and in the Kohala coast/Waimea/Kawaihae area. The towns of Hilo and Volcano had approximately 1300 and 290 visitor accommodation units, respectively (Department of Business, Economic Development, and Tourism [DBEDT], 2008)

Visitor attractions including museums, cultural sites, and parks generated over 4.3 million visitor trips in 2007 (DBEDT, 2008). The attractions that generated the largest number of trips included Hawaii Volcanoes National Park, Pu'uhonua Honaunau National Historical Park (City of Refuge), Panaewa Rainforest Zoo, Kaloko-Honokohau National Historical Park, Pu'ukohola Heiau National Historic Site, and Volcano Art Center. Other activities that attracted visitors included Akaka Falls, Lapakahi State Historic Park, viewing petroglyph sites, deep-sea fishing, and cultural events such as the Merrie Monarch Hula Festival and the Kona Coffee Festival, and sports events such as the Ironman Triathlon.

Airport and Harbor Cargo

Air and harbor cargo also impact socioeconomic and travel demand characteristics through the county. As noted previously, there are no specified freight routes, however, airport and harbor cargo are transported along many of the arterial roadways to transport goods to market.

The annual air traffic statistics (HDOT, 2008) summarized the cargo tonnage accommodated through the airports within the county. Over 45,000 tons of cargos were handled during 2007. The Kona International and Hilo International airports share the cargo operations, with 22.3 tons and 24.1 tons of cargo, respectively.

HDOT Harbors Division recorded over 2.7 million tons of cargo through the Island of Hawaii's commercial harbors. Hilo Harbor recorded over 1.7 million tons and Kawaihae Harbor approximately 1.0 million tons of cargo.

Existing System Performance

The existing transportation system performance is described in terms of operations and safety. These discussions establish existing or baseline performance characteristics from which the future scenarios can be assessed.

Vehicular Volumes

Near Hilo, average daily traffic volumes, as estimated by the travel demand model, on Keeau-Pahoa Road (Highway 130) peak at approximately 20,200 vehicles per day in each direction, for a total of 40,400 daily vehicles. This roadway provides the sole access between Hawaii Belt Road and communities on the eastern tip of the island such as Puna, Pahoa, and Kalapana. Volumes during the morning peak are generally higher in the northbound direction (towards Hilo), while in the afternoon they are higher in the southbound direction leaving town. South of Hilo, on Hawaii Belt Road near Kurtistown, the average daily volume is approximately 22,900 vehicles per day. These daily volumes gradually decrease as the highway moves further away from Hilo, through the towns of Mountain View and Volcano, due to lower population and household density. West of Volcano, daily volumes continue to decrease through Hawaii Volcanoes National Park but begin to increase on the south and west side of the island through Captain Cook where volumes range between 4,000 at Naalehu and 12,200 daily vehicles at Honaunau.

South of Kona, average daily traffic volumes on Hawaii Belt Road (Highway 11) peak at approximately 27,100 vehicles per day at Lako Street. Just north of Lako Street, Kuakini Highway diverts from Hawaii Belt Road and both these roadways provide access to the Kailua-Kona waterfront area. Because Kuakini Highway provides an alternate route, daily traffic on the belt road decreases slightly to approximately 19,600 vehicles through Kona. North of Kona near the Kona International Airport, traffic volumes as estimated by the travel demand model on Queen Kaahumanu Highway (Highway 19) increase to approximately 20,600 vehicles per day. Volumes increase further to 22,500 vehicles per day near the Kohala coast resorts, then gradually decrease through Waimea and Honokaa. Volumes are typically higher in the direction heading towards Kona in the morning, and away from Kona in the afternoon. Saddle Road between Hilo and Waikoloa, and Hawaii Belt Road/Mamalaho Highway between Kona and Waikoloa both carry roughly 6,000 vehicles per day each.

Highway Volume-to-Capacity Ratio and Level of Service

The performance of the existing roadway network is described in terms of volume-to-capacity (V/C) ratio and level of service (LOS). Level of service generally describes operating conditions on a roadway based on a variety of measures, such as delay, speed, and density. There are six LOS classifications, each given a letter designation from A to F. The classifications are defined by the Transportation Research Board's *2010 Highway Capacity Manual*. LOS A represents ideal operating conditions with little to no delay and where movements are not influenced

Level of Service (LOS) Definitions

LOS A	Free flows operation, vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.
LOS B	Reasonably free flow, vehicles maneuver within the traffic stream is only slightly restricted.
LOS C	Freedom to maneuver within the traffic stream is noticeably restricted.
LOS D	Freedom to maneuver within the traffic stream is more noticeably limited and the driver experiences reduced physical and psychological comfort level.
LOS E	Vehicles are closely spaced, leaving little room to maneuver within the traffic stream at speeds that still exceed 49 miles per hour.
LOS F	Breakdowns in vehicular flow.

Source: Highway Capacity Manual, 2000.

by other vehicles on the roadway. LOS F represents poor operating conditions, including high delays and extreme congestion.

Traffic operations can also be described by volume to capacity ratios. This measurement quantifies the relative vehicle demand versus the capacity of a facility. A V/C ratio of 1.0 indicates the vehicle demand is equal to the capacity of the facility, and correlates to LOS F conditions.

Table 7 summarizes the performance of the existing modeled roadway system. The model includes all roads on the federal-aid roadway system (arterials and collectors), as well as select local roads (necessary for circulation and distribution of local traffic). Roadways in the model are referred to as links, and each link is classified based on characteristics such as speed, capacity, and the roadway's federal functional classification. Link classification may not exactly match the roadway's federal functional classification due to adjustments made during the model validation process. Adjustments to link classifications were made to align observed traffic with the model's traffic assignment.

As estimated by the 2007 travel demand forecast model, 17 percent of all lane miles on links classified as principal arterials operate at LOS F, or at a V/C ratio of 1.0 or higher. These overcapacity roadway links include Hawaii Belt Road (Highway 11) through Hilo and Hawaii Belt Road/Mamalahoa Highway (Highway 19) through Waimea. At both of these locations, highway speed is reduced through the town and vehicles are allowed to enter and exit the highway via multiple access points, which reduces capacity. In Kailua-Kona, Queen Kaahumanu Highway (Highway 19) between Kealakehe Parkway and Kona International Airport and Hawaii Belt Road/Mamalahoa Highway (Highway 11) between Kamehameha III Road and Henry Street also operate at LOS F due to high traffic volumes.

Although daily traffic volumes are at or exceed the daily capacity of the roadway on links classified as principal arterials, the majority of arterial and collector roadways (91 percent) included in the Hawaii forecast model operate at LOS C or better (V/C ratios of 0.8 or less). As shown in Table 7, the majority of the 1,628 lane-miles modeled on the island are generally operating under uncongested conditions daily. Figure 10 shows the 2007 daily V/C ratios of modeled facilities on the Island of Hawaii.

TABLE 7
2007 Daily Roadway Performance

Roadway Link Classification	Percentage of Lane Miles				Lane Miles
	V/C < 0.8 (LOS C or better)	0.8 ≤ V/C < 0.9 (LOS D)	0.9 ≤ V/C < 1.0 (LOS E)	V/C ≥ 1.0 (LOS F)	
Principal Arterials	69%	4%	10%	17%	292
Minor Arterials	89%	5%	2%	4%	364
Collectors	98%	1%	1%	0%	972
Total	91%	2%	3%	4%	1628

CH2M HILL, 2012b.



Updated 2/12/2013

FIGURE 10
Existing Volume to Capacity Ratio

Vehicle Trips

Approximately 456,580 daily vehicle trips were generated on the Island of Hawaii in 2007 as estimated by the travel demand forecasting model. A complete vehicle trip includes one origin and one destination. Approximately 34 percent of vehicle trips on the island (or approximately 157,290 trips) travel to, from, or completely within the South Hilo district, while approximately 27 percent (123,180 trips) of trips have at least one trip end in the North Kona district. This trip trend is a reflection of Kona and Hilo towns as the population and employment hubs on the island.

As shown in Table 8, most of daily trips generated within each district are able to complete their trip purpose within the district. In the South Hilo and North Kona districts approximately 80 percent of trips generated travel to and from other points within their respective districts. In the South Kohala district, approximately 68 percent of daily vehicle trips remain internal to the district boundaries.

TABLE 8
2007 Daily Vehicle Trips by District

Planning District	Destination									
	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Total
North Kohala	5,130	2,410	140	20	160	40	10	760	20	8,690
South Kohala	2,410	39,480	3,540	590	3,650	1,070	370	6,960	390	58,460
Hamakua	140	3,540	5,880	330	830	220	70	930	40	11,980
North Hilo	20	590	330	600	860	120	10	30	10	2,570
South Hilo	160	3,650	830	860	125,030	25,520	530	600	110	157,290
Puna	40	1,070	220	120	25,520	34,980	750	100	10	62,810
Kau	10	370	70	10	530	750	6,990	2,980	1,640	13,350
North Kona	760	6,960	930	30	600	100	2,980	102,830	7,990	123,180
South Kona	20	390	40	10	110	10	1,640	7,990	8,040	18,250
Total	8,690	58,460	11,980	2,570	157,290	62,810	13,350	123,180	18,250	456,580

CH2M HILL, 2012b

The average daily trip length between districts is shown in Table 9. An average trip length between the North Kohala district and the Kau district, as estimated by the travel demand forecasting model, is approximately 115 miles, while an average trip length between South Hilo and South Kona is approximately 102 miles. The average length for trips originating in the South Hilo district is approximately 8 miles, which is shorter than trips from other districts and indicates that most trips do not need to travel outside of the district in order to complete their trip purpose. The average trip length for trips originating in the Kau district is 35 miles, which indicates trips must travel relatively long distances to complete their purposes.

The travel demand forecasting model estimated approximately 4,990,900 daily vehicle miles were traveled in 2007 on the Island of Hawaii. These daily vehicle miles were traveled by motorized vehicles including automobiles and trucks. During the p.m. peak, an estimated 486,590 vehicle miles (approximately 10 percent of the daily total) were traveled.

TABLE 9
2007 Daily Average Vehicle Trip Length between Districts (Miles)

Planning District	Destination									
Origin	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Weighted Average
North Kohala	5	23	37	56	78	94	115	47	71	17
South Kohala	23	9	24	44	65	81	104	29	52	19
Hamakua	37	24	5	18	42	58	85	53	72	20
North Hilo	59	44	18	6	21	40	82	67	91	26
South Hilo	78	65	42	21	4	17	44	87	102	8
Puna	94	81	58	40	17	10	24	98	100	15
Kau	115	104	85	82	44	24	13	61	34	35
North Kona	47	29	53	67	87	98	61	5	14	10
South Kona	71	52	72	91	102	100	34	14	6	14
Weighted Average	17	19	20	26	8	15	35	10	14	12

CH2M HILL, 2012b

Average Trip Time

The overall, island-wide, average trip time per vehicle trip on Hawaii in 2007 was 26 minutes as estimated by the travel demand forecasting model and shown in Table 10. Trips originating from the Kau district would take on average over 3 hours (185 minutes) to the North Kohala district, while an average trip between South Kona and South Hilo would take over 2.5 hours (an average of 154 minutes). Internal trips within the South Hilo district would take on average 8 minutes to complete.

TABLE 10
2007 Daily Average Vehicle Trip Time between Districts (Minutes)

Planning District	Destination									
Origin	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Weighted Average
North Kohala	10	37	68	99	120	165	184	74	119	28
South Kohala	37	17	44	70	100	145	169	50	94	34
Hamakua	67	43	12	29	63	110	139	87	121	36
North Hilo	99	69	29	10	33	83	143	110	159	42
South Hilo	120	99	63	33	8	46	74	134	151	18
Puna	167	147	112	86	49	26	43	170	154	39
Kau	185	171	142	146	78	43	26	103	55	60
North Kona	74	50	88	110	134	168	103	13	31	20
South Kona	119	95	122	159	154	154	55	31	14	28
Weighted Average	28	34	36	42	18	38	60	20	28	26

CH2M HILL, 2012b

A total of 162,440 daily vehicle hours of travel were estimated by the travel demand forecasting model in 2007. This vehicle hour estimate includes all time spent traveling by automobiles and trucks. During the p.m. peak, 17,950 vehicle hours (or approximately 11 percent of the daily total) were generated in 2007.

Travel Time

Figure 11 depicts the estimated p.m. peak vehicle travel times from Kona to other locations on the island in 2007. From Kona, an average vehicle trip to North Kohala would take between 60 and 75 minutes, while trips to Hilo and most of the east coast of the island would take more than 2 hours.

Figure 12 depicts estimated p.m. peak travel times from Hilo in 2007. Trips to Kona and the southwest coast would take over 2 hours, while trips to the Honokaa area could take up to 75 minutes.

Trips from Hilo to the southeastern portion of Puna would take up to 2 hours as estimated by the travel demand forecasting model. As shown on Figure 10, Keeau-Pahoa Road (Highway 130) is congested and has a V/C ratio of 1.0 or higher. This congestion causes extremely low operating speeds and results in long travel times. Keeau-Pahoa Road is a primary arterial and the only access route into the southeastern portion of the Puna area. Many of the trips destined to Puna in the p.m. peak hour must use this roadway and therefore will experience long travel times.

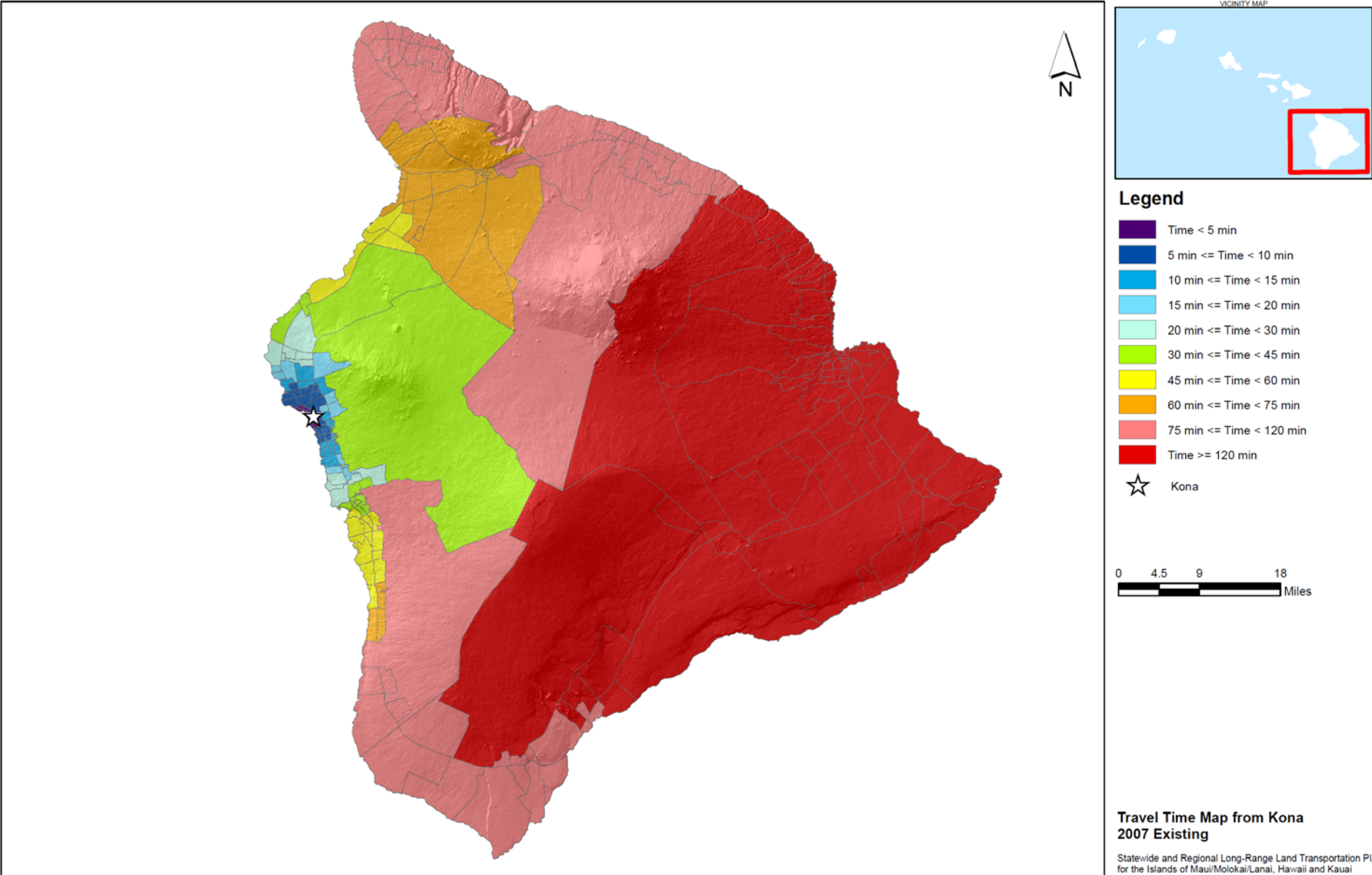


FIGURE 11
Existing Travel Time from Kona
CH2M HILL, 2012b

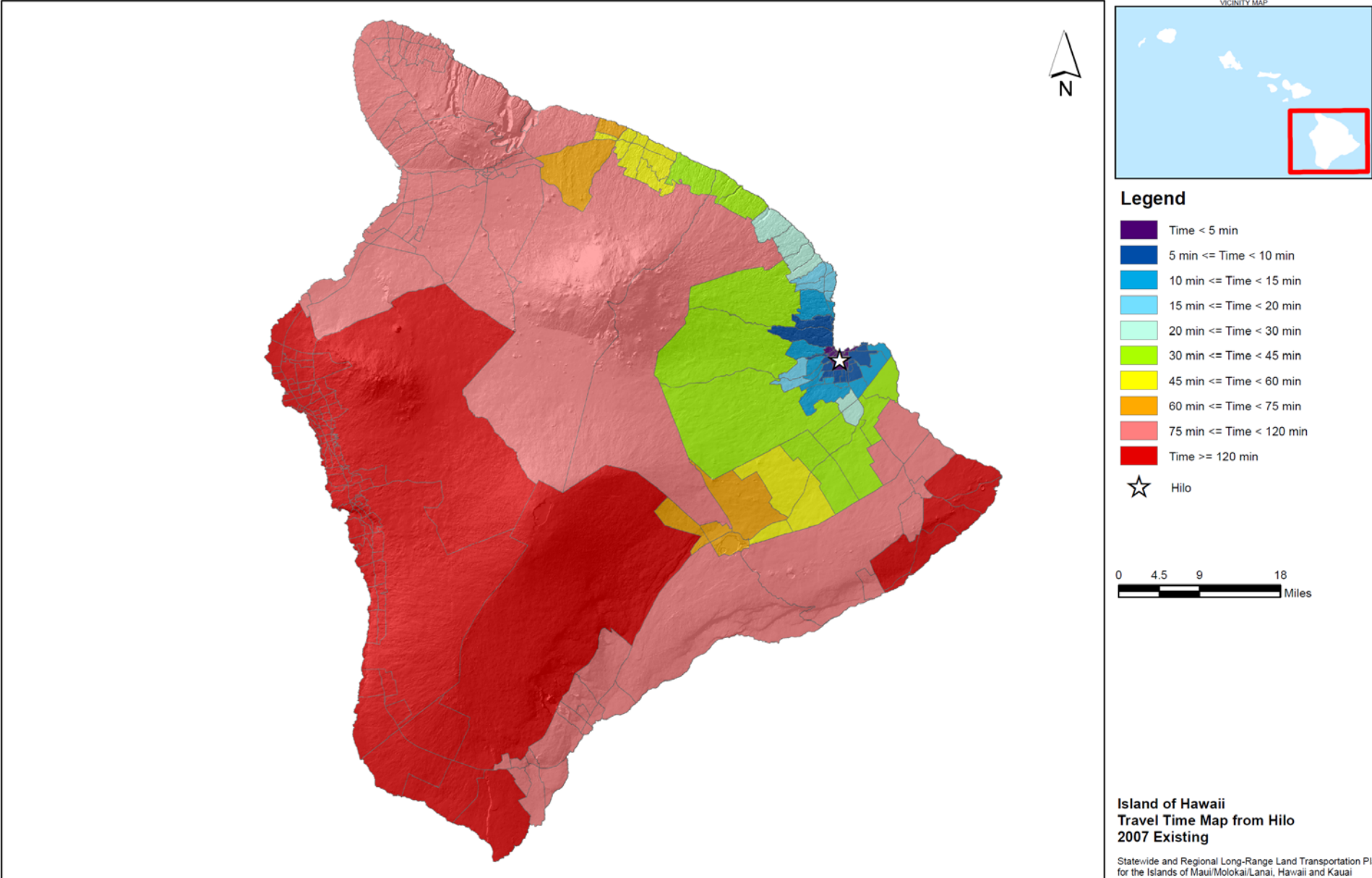


FIGURE 12
Existing Travel Time from Hilo
CH2M HILL, 2012b

Accident Locations

The Highway Safety Improvement Program (HDOT, 2011a) compiles accident data for the state roadways and state and county intersections. The following lists depict the locations with high accident rates and/or occurrences during the 2006 to 2008 timeframe.

State route locations (non-intersection) with accident rates above 200 and six or more accidents between 2006 and 2008:

- Mamalahoa Highway (Route 11) MP 90.70- 91.00
- Mamalahoa Highway (Route 11) MP 67.50- 67.80
- Hawaii Belt Road (Route 19) MP 28.30- 28.60
- Mamalahoa Highway (Route 11) MP 67.80- 68.10
- Mamalahoa Highway (Route 11) MP 69.60- 69.90
- Mamalahoa Highway (Route 11) MP 65.60- 65.90
- Kohala Mountain Road (Route 250) MP 7.40- 7.70
- Kohala Mountain Road (Route 250) MP 10.10- 10.40
- Mamalahoa Highway (Route 11) MP 95.40- 95.70
- Hawaii Belt Road (Route 19) MP 26.60- 26.90
- Hawaii Belt Road (Route 19) MP 28.60- 28.90
- Hawaii Belt Road (Route 19) MP 26.00- 26.30
- Mamalahoa Highway (Route 11) MP 100.90- 101.20
- Mamalahoa Highway (Route 11) MP 98.60- 98.90
- Mamalahoa Highway (Route 11) MP 67.00- 67.30
- Mamalahoa Highway (Route 11) MP 68.80- 69.10
- Mamalahoa Highway (Route 11) MP 94.40- 94.70
- Mamalahoa Highway (Route 11) MP 91.00- 91.30
- Mamalahoa Highway (Route 11) MP 91.70- 92.00
- Mamalahoa Highway (Route 11) MP 93.90- 94.20
- Mamalahoa Highway (Route 11) MP 68.10- 68.40
- Hawaii Belt Road (Route 19) MP 21.30- 21.60
- Hawaii Belt Road (Route 19) MP 11.30- 11.60
- Hawaii Belt Road (Route 19) MP 15.80- 16.10
- Mamalahoa Highway (Route 190) MP 20.80- 21.10
- Mamalahoa Highway (Route 11) MP 101.90- 102.20
- Mamalahoa Highway (Route 11) MP 105.90- 106.20
- Hawaii Belt Road (Route 19) MP 35.00- 35.30
- Hawaii Belt Road (Route 19) MP 22.90- 23.20
- Hawaii Belt Road (Route 19) MP 26.90- 27.20
- Hawaii Belt Road (Route 19) MP 27.90- 28.20
- Volcano Road (Route 11) MP 14.50- 14.80
- Kamehameha Avenue (Route 19) MP 0.90- 1.20
- Kalaniana'ole Street/Kamehameha Avenue (Route 19) MP 0.60- 0.90
- Hawaii Belt Road (Route 19) MP 12.90- 13.20
- Hawaii Belt Road (Route 19) MP 40.30- 40.60
- Volcano Road (Route 11) MP 9.60- 9.90
- Hawaii Belt Road (Route 190) MP 37.80- 38.10

- Kalanianaʻole Street (Route 19) MP 0.30- 0.60
- Hawaii Belt Road (Route 19) MP 2.70- 3.00
- Kawaihae Road (Route 19) MP 64.80- 65.10
- Mamalahoa Highway (Route 11) MP 106.50- 106.80

State intersection locations with nine or more crashes between 2006 and 2008:

- Keaau-Pahoa Road (Route 130)/Old Government Road
- Keaau-Pahoa Road (Route 130)/Ainaloa Boulevard
- Keaau-Pahoa Road (Route 130)/Makuu Drive
- Keaau-Pahoa Road (Route 130)/Kahakai Boulevard
- Keaau-Pahoa Road (Route 130)/Orchidland Drive
- Keaau-Pahoa Road (Route 130)/Paradise Drive
- Volcano Road (Route 11)/North Kulani Road and South Kulani Road
- Kawaihae Road (Route 19)/Queen Kaahumanu Highway
- Kuakini Highway (Route 11)/Lako Street
- Volcano Road (Route 11)/Old Volcano Road
- Hawaii Belt Road (Route 19)/Mamalahoa Highway
- Puainako Street (Route 2000)/Kekela Street
- Kanoiehua Avenue (Route 11)/Puainako Street
- Queen Kaahumanu Highway (Route 19)/Mauna Lani Drive
- Volcano Road (Route 11)/Keaau-Pahoa Road
- Queen Kaahumanu Extension (Route 11)/Henry Street
- Queen Kaahumanu Highway (Route 19)/Hina-Lani Street
- Keaau-Pahoa Road (Route 130)/Pohaku Drive and Shower Drive
- Puainako Street (Route 2000)/Kinoole Street
- Puainako Street (Route 2000)/Kilauea Street
- Keaau-Pahoa Road (Route 130)/Old Keaau-Pahoa Road
- Keaau-Pahoa Road (Route 130)/Kaloli Drive
- Kanoiehua Avenue (Route 11)/Leilani Street
- Kanoiehua Avenue (Route 11)/Makaala Street
- Queen Kaahumanu Highway (Route 19)/Kaiminani Drive
- Queen Kaahumanu Highway (Route 19)/Kealakehe Parkway
- Kuakini Highway (Route 11)/Haawina Street
- Volcano Road (Route 11)/Mamaki Street
- Volcano Road (Route 11)/Old Keaau-Pahoa Road
- Volcano Road (Route 11)/Lama Street
- Queen Kaahumanu Extension and Highway (Route 11)/Palani Road
- Kamehameha Avenue (Route 19)/Lihikai Street and Manono Street
- Volcano Road (Route 11)/Kipimana Street and East Kipimana Street
- Kamehameha Avenue (Route 19)/Pauahi Street
- Queen Kaahumanu Highway (Route 19)/Makala Boulevard
- Kanoiehua Avenue (Route 11)/Kekuanaoa Street
- Kanoiehua Avenue (Route 11)/Kahaopea Street
- Kanoiehua Avenue (Route 11)/Kawailani Street
- Kanoiehua Avenue (Route 11)/East Palai Street

County intersection locations (that are part of the federal-aid highways system) with nine or more crashes between 2006 and 2008:

- Kilauea Avenue/East Kahaopea Street
- Kilauea Avenue/Mohouli Street
- Kilauea Avenue/Kawailani Street
- Komohana Street/Mohouli Street
- Mamalahoa Highway/Napoopoo Road
- Pahoa-Kapoho Road/Nanawale Boulevard
- Kinoole Street/Kawili Street
- Komohana Street/Kawailani Street
- Kawailani Street/Iwalani Street
- Mohouli Street/Kumukoa Street
- Kaiwi Street/Luhia Street
- Kilauea Avenue/Hualalai Street
- Kinoole Street/Haihai Street
- Kinoole Street/Waianuenue Avenue

State locations with two or more pedestrian related crashes between 2006 and 2008:

- Queen Kaahumanu Extension (Route 11) at Henry Street MP 122.1
- Pahoa-Kalapana Road (Route 130) at MM 13 MP 13.1

County locations (that are part of the federal-aid highways system) with two or more pedestrian related crashes between 2006 and 2008:

- Keawe Street (Route 1920)/Haili Street
- Kilauea Avenue (Route 1920)/Mohouli Street

The HDOT has provided this traffic accident information under the protection of 23 United States Code 402(k) and 409. This information may not be used in any federal or state court proceeding in any action for damages arising from any occurrence at a location mentioned or addressed in the information provided.

Forecast Year Conditions (2020/2035)

Baseline Transportation System

The baseline transportation system includes projects that have been completed since 2007 and those that have committed construction funding as defined by the Department of Transportation *Statewide Transportation Improvement Program: Revision #3 FFY 2011 Through 2014* (HDOT, 2011b). For the purpose of the future baseline Hawaii travel demand model, projects that have effects on roadway capacity were added to the 2007 system. Table 11 lists the projects that were included in both the 2020 and 2035 baseline transportation systems.

TABLE 11
Baseline Transportation Projects

Facility	Location	Project Description/ Recommendation	Status
North Kona			
Queen Kaahumanu Highway	Kona International Airport at Keahole to Kailua-Kona and Henry Street to Kamehameha III Road	Widen Queen Kaahumanu Highway to a four-lane divided highway.	Phase 1 Henry Street to Kealakehe Parkway has been completed. Phase 2 Kealakehe Parkway to Keahole Airport estimated 2013 construction completion.
Palani Road	Proposed Keanalehu (Waena) Drive to Queen Kaahumanu Highway	Widen Palani Road or construct the proposed Palani Bypass.	Intersection improvements at the Palani/Kealakehe intersection have been completed. Widening of Palani Road from Henry to Queen Kaahumanu is included with the Ane Keohokalole project.
Ane Keohokalole Highway	Palani Road to proposed University Drive	Construct Ane Keohokalole Highway (mid-level road). Construct a collector road from Keohokalole Highway extending north to Mamalahoa Highway.	Phase 1 Palani Road to Kealakehe Parkway estimated 2012 construction completion. Grading only from Kealakehe Parkway to Hina Lani estimated 2012 construction completion. No estimate for completion of other phases.
Hokulia Bypass	Keauhou to Captain Cook	Construct a two-lane Mamalahoa Bypass Highway as a scenic corridor, with limited access and without commercial development.	Bypass highway from Alii Drive to Halekii Street section has been completed but has restricted use.
Laaloa Avenue	Existing terminus to Kuakini Highway	Extend the existing Laaloa Avenue to provide a mauka-makai connector between Alii Drive and Kuakini Highway.	Estimated 2013 construction completion.
Hawaii Belt Road	Palani Road to Kuakini Highway	Widen existing two-lane highway to four lanes including intersection improvements.	Constructed.
Kuakini Highway	Makala Boulevard to Palani Road	Widen existing two-lane highway to four lanes including intersection improvements.	Constructed.

TABLE 11
Baseline Transportation Projects

Facility	Location	Project Description/ Recommendation	Status
Kuakini Highway	Palani Road to Hualalai Road	Widen existing two-lane highway to five lanes, including center turning lane and intersection improvements.	Constructed.
Kuakini Highway	Hualalai Road (Route 1880) to Alii Highway	Widen approx. 1.5 miles of Kuakini Highway to increase capacity between Hualalai Road and the new Alii Highway.	Estimated 2015 construction completion.
South Kona			
Halekii Street	Hawaii Belt Road to Mamalahoa Bypass	Extend Halekii Street to connect to the Mamalahoa Bypass Highway.	Constructed.
South Kohala			
Parker Ranch Road	Kamamalu Street to Mamalahoa Highway	Construct Parker Ranch's connector road to relieve traffic congestion through Waimea town.	Complete from Mamalahoa to Pukalani. No estimate for completion to Kamamalu (Phase 2).
Queen Kaahumanu Highway	Intersection at Kawaihae Road	Improve operation, capacity, and safety of Queen Kaahumanu Highway and Kawaihae Road intersection.	Estimated 2012 construction completion.
Puna			
Keaau-Pahoa Road	Keaau Bypass Road to Shower Drive	Shoulder lane conversion.	Phase 1 estimated 2014 construction completion. Phase 2 construction is planned to begin in 2014.
Hamakua			
Akoni Pule Highway	At Aamakao Gulch	Realign and widen roadway, improve shoulders and rock catchment area.	Estimated 2015 construction completion.
Hilo			
Saddle Road	East Side Grade & Pave MP 6 to 11; West Side MP 42 to Mamalahoa Hwy	Widen and/or realign the existing two-lane highway.	Eastside: 2013 Construction Westside: Phase 1 2012 Construction Phase 2 2013 Construction Phase 3 2014 Construction Phase 4 2015 Construction
Mohouli Street Extension	Komohana Street to Ainako Avenue/ Kaumana Drive intersection	New two-lane highway with improved, signalized intersections at both termini.	Constructed.
Puainako Street Extension	Komohana Street to Country Club Road at Kaumana Drive	New two-lane highway with separate turning lanes at major intersections.	Constructed.

Forecast Socioeconomic Conditions

The aggregate land use and socioeconomic forecast data were developed by DBEDT in November 2008. These data include forecasts of population, employment, and visitors for each county in the State of Hawaii. Hawaii County staff provided information on where they expected future growth to occur within the island. This information was used to assist in the distribution of the DBEDT forecasts for the island to the traffic analysis zones. Hawaii staff provided growth information for housing units, visitor accommodations, and square footage by retail, office, and industrial uses by traffic analysis zones. This information was used to distribute forecast variables (households, retail, service and other employment, and visitor accommodations).

The methodology used to develop and process the forecasts is contained in Attachment 2, while a summary of socioeconomic forecasts is included in Attachment 3.

Population

Table 12 summarizes the population growth within Hawaii County by districts. The island-wide population is expected to grow by 30 percent by 2020 and 62 percent overall by 2035. The majority of this growth would occur in the North and South Kohaha districts. Compared to 2007, the population in both districts is expected to grow by at least 50 percent by the year 2020 and would more than double by 2035.

By 2035, the Puna district is expected to grow by approximately 42,080 residents. This growth represents almost 40 percent of the total population change by 2035 and nearly doubles the current population in the district. The population in the North and South Hilo districts is expected to increase by 5 percent or less by 2020 and by 10 percent or less by 2035.

TABLE 12
Forecast Population

Planning District	Population			Population Change (Year 2007 to Year 2020)		Population Change (Year 2007 to Year 2035)	
	2007	2020	2035	Difference	% Difference	Difference	% Difference
North Kohala	5,600	9,310	13,440	3,710	66%	7,840	140%
South Kohala	16,790	25,320	34,840	8,530	51%	18,050	108%
Hamakua	6,090	6,810	7,710	720	12%	1,620	27%
North Hilo	1,910	1,990	2,080	80	4%	170	9%
South Hilo	47,620	49,790	50,540	2,170	5%	2,920	6%
Puna	42,380	62,170	84,460	19,790	47%	42,080	99%
Kau	7,900	9,960	11,720	2,060	26%	3,820	48%
North Kona	35,780	46,470	57,510	10,690	30%	21,730	61%
South Kona	8,970	13,450	17,750	4,480	50%	8,780	98%
Total	173,040	225,270	280,050	52,230	30%	107,010	62%

CH2M HILL, 2012a (Population based on forecasts from the DBEDT. Allocations based on data provided in the Hawaii County General Plan).

Households

Table 13 summarizes the household growth within Hawaii County by districts. The total number of households on the island is expected to increase by 32 percent by 2020 and by 69 percent by 2035. Similar to population discussed above, the North and South Kohala districts would experience the highest percentage of household growth compared to all other districts. By 2020, the number of households in the North Kohala district would increase by 74 percent compared to existing 2007 conditions. By 2035, households would increase by nearly 160 percent. The number of households in the South Kohala district would increase by over 120 percent by 2035 compared to current conditions.

Households in the Puna district would grow by over 50 percent by 2020 and would more than double by 2035 compared to 2007 conditions. Almost 40 percent of all household growth on the island would occur within the Puna district. By contrast, the Hamakua, North Hilo, and South Hilo districts combined would account for less than 5 percent of the total island household growth by 2035.

Figures 13 and 14 illustrate the number of households throughout the Island of Hawaii for Years 2020 and 2035, respectively.

TABLE 13
Forecast Households

Planning District	Households			Households Change (Year 2007 to Year 2020)		Households Change (Year 2007 to Year 2035)	
	2007	2020	2035	Difference	% Difference	Difference	% Difference
North Kohala	1,980	3,440	5,100	1,460	74%	3,120	158%
South Kohala	5,940	9,350	13,230	3,410	57%	7,290	123%
Hamakua	2,160	2,510	2,930	350	16%	770	36%
North Hilo	690	740	790	50	7%	100	14%
South Hilo	17,670	18,380	19,180	710	4%	1,510	9%
Puna	14,960	22,950	32,060	7,990	53%	17,100	114%
Kau	3,000	3,680	4,450	680	23%	1,450	48%
North Kona	13,050	17,160	21,830	4,110	31%	8,780	67%
South Kona	3,410	4,970	6,740	1,560	46%	3,330	98%
Total	62,860	83,180	106,310	20,320	32%	43,450	69%

CH2M HILL, 2012a (Households based on population forecasts from the State of Hawaii Department of Business, Economic Development and Tourism and persons per household growth from 2000 and 2010 Census).

Employment

Table 14 summarizes the employment growth within Hawaii County by districts. Compared to 2007, the total number of jobs on the island is expected to grow by approximately 25 percent by 2020, and by approximately 50 percent overall by 2035. The South Hilo district is expected to support more than 40 percent of the island's job opportunities in the future and will remain the islands' primary employment center. Compared to 2007 conditions, approximately 7,490 additional jobs are expected by 2020 (an increase of 28 percent), and an additional 6,910

employment opportunities are expected by 2035 (an increase of 53 percent compared to existing).

The North Kona district would support over 30 percent of all employment in the future, while the South Kohala district would have approximately 10 percent of the island's job opportunities. Employment in the remaining districts would be similar to existing conditions and each would continue to support less than 5 percent of the island's total jobs. Figures 15 and 16 illustrate the number of employment throughout the Island of Hawaii for Years 2020 and 2035, respectively.

TABLE 14
Forecast Employment

Planning District	Employment			Employment Change (Year 2007 to Year 2020)		Employment Change (Year 2007 to Year 2035)	
	2007	2020	2035	Difference	% Difference	Difference	% Difference
North Kohala	780	920	1,100	140	18%	320	41%
South Kohala	10,600	12,350	14,770	1,750	17%	4,170	39%
Hamakua	1,010	1,300	1,580	290	29%	570	56%
North Hilo	160	210	250	50	31%	90	56%
South Hilo	27,050	34,540	41,450	7,490	28%	14,400	53%
Puna	4,350	4,860	5,750	510	12%	1,400	32%
Kau	920	1,160	1,410	240	26%	490	53%
North Kona	21,340	26,940	32,640	5,600	26%	11,300	53%
South Kona	2,140	3,050	3,760	910	43%	1,620	76%
Total	68,350	85,330	102,710	16,980	25%	34,360	50%

CH2M HILL, 2012a (Employment based on forecasts from the State of Hawaii Department of Business, Economic Development and Tourism. Allocations based on existing employment data).

Visitor Industry

The Island of Hawaii airports are forecast to accommodate approximately 5.3 million passengers in Year 2020 and 6.1 million passengers in Year 2035 (CH2M HILL, 2012b). This forecast equates to an approximate 8.1 percent increase of passengers by Year 2020, and 24.0 percent increase by Year 2035.

Hilo Harbor is forecast to accommodate approximately 540,020 cruise ship passengers in Year 2020 and 619,380 passengers in Year 2035 (CH2M HILL, 2012b). This forecast equates to an approximate 8.1 percent increase of passengers by Year 2020, and 24.0 percent increase by Year 2035.

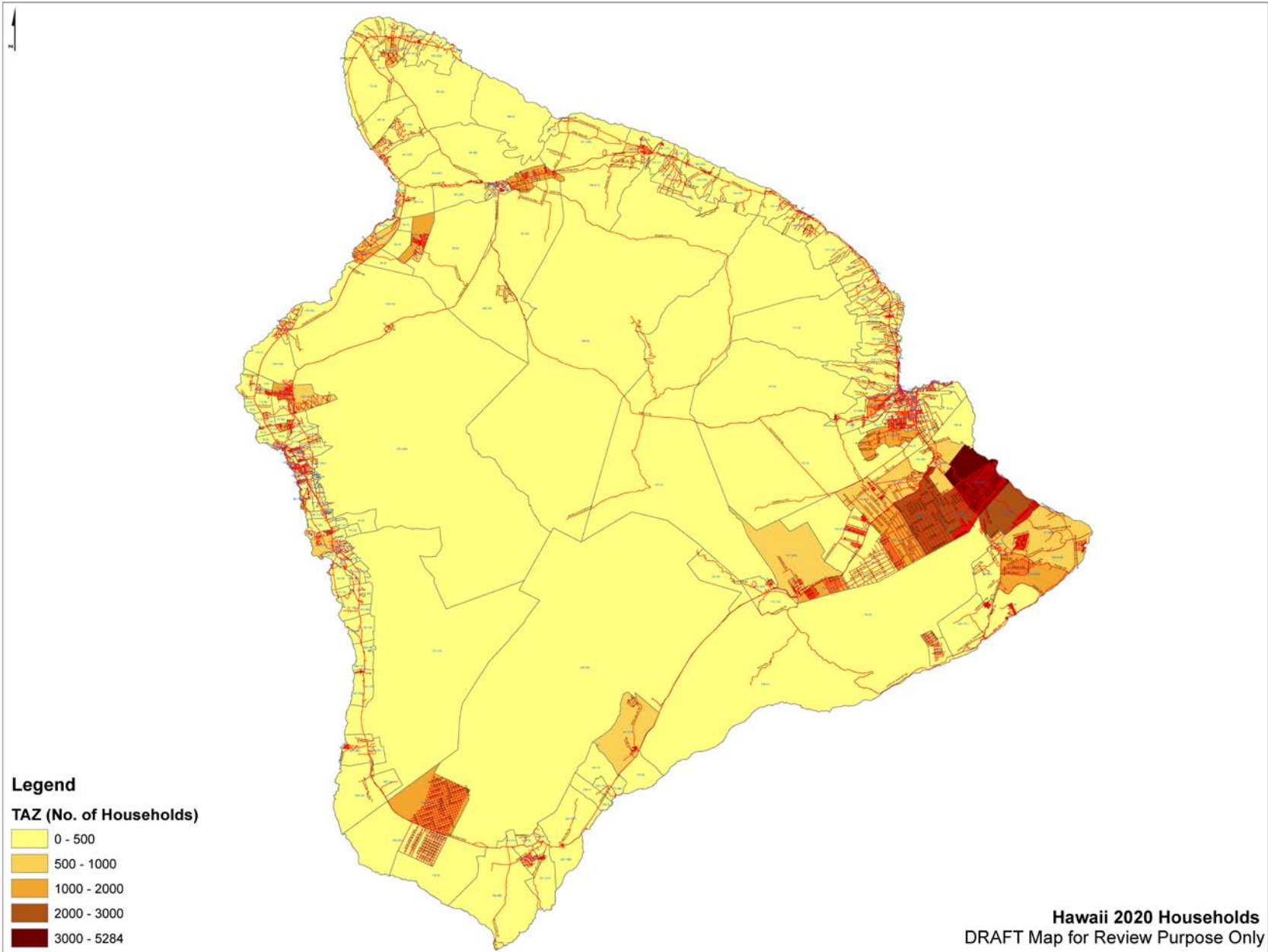


FIGURE 13
Year 2020 Households

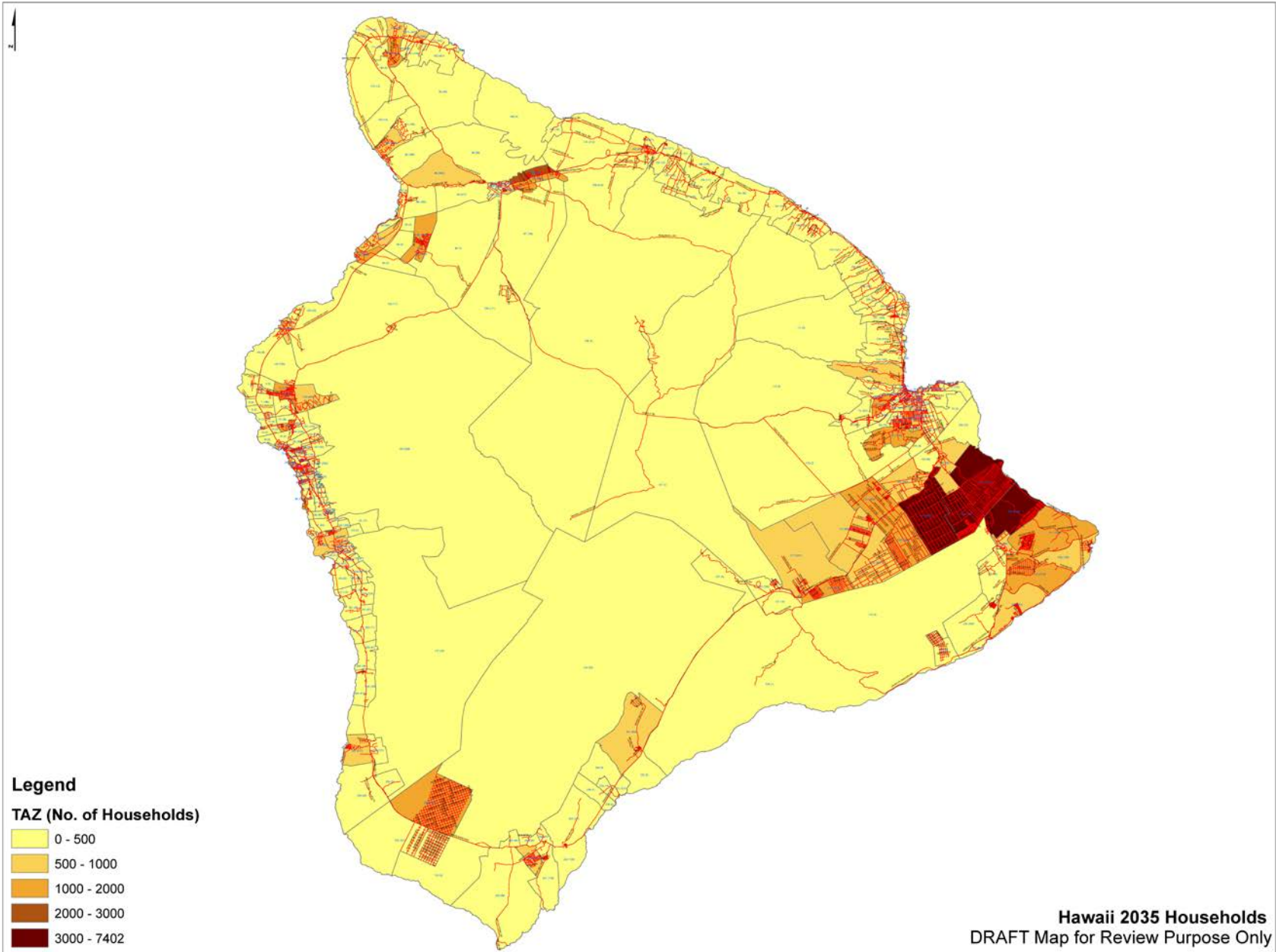


FIGURE 14
Year 2035 Households

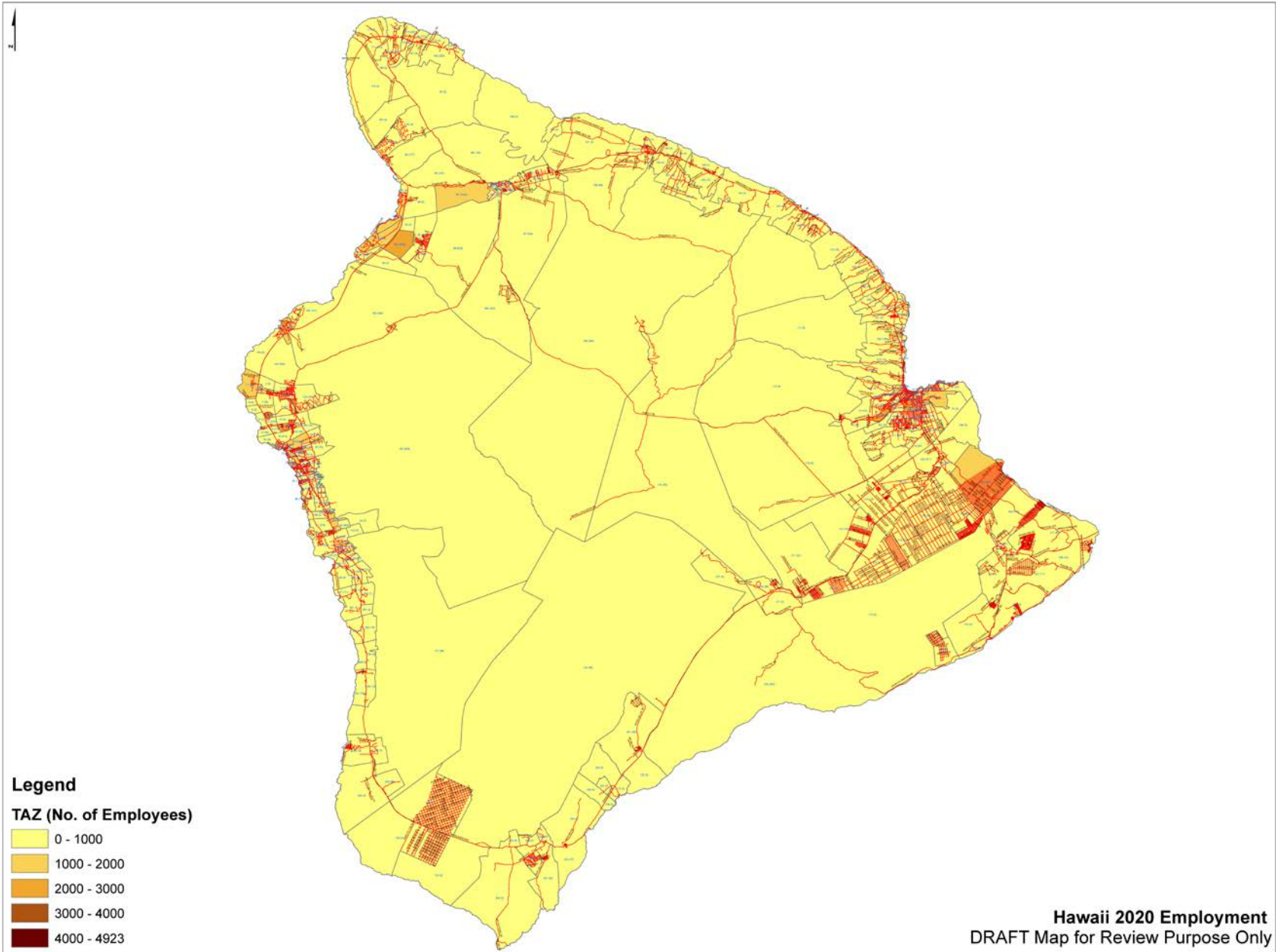


FIGURE 15
Year 2020 Employment

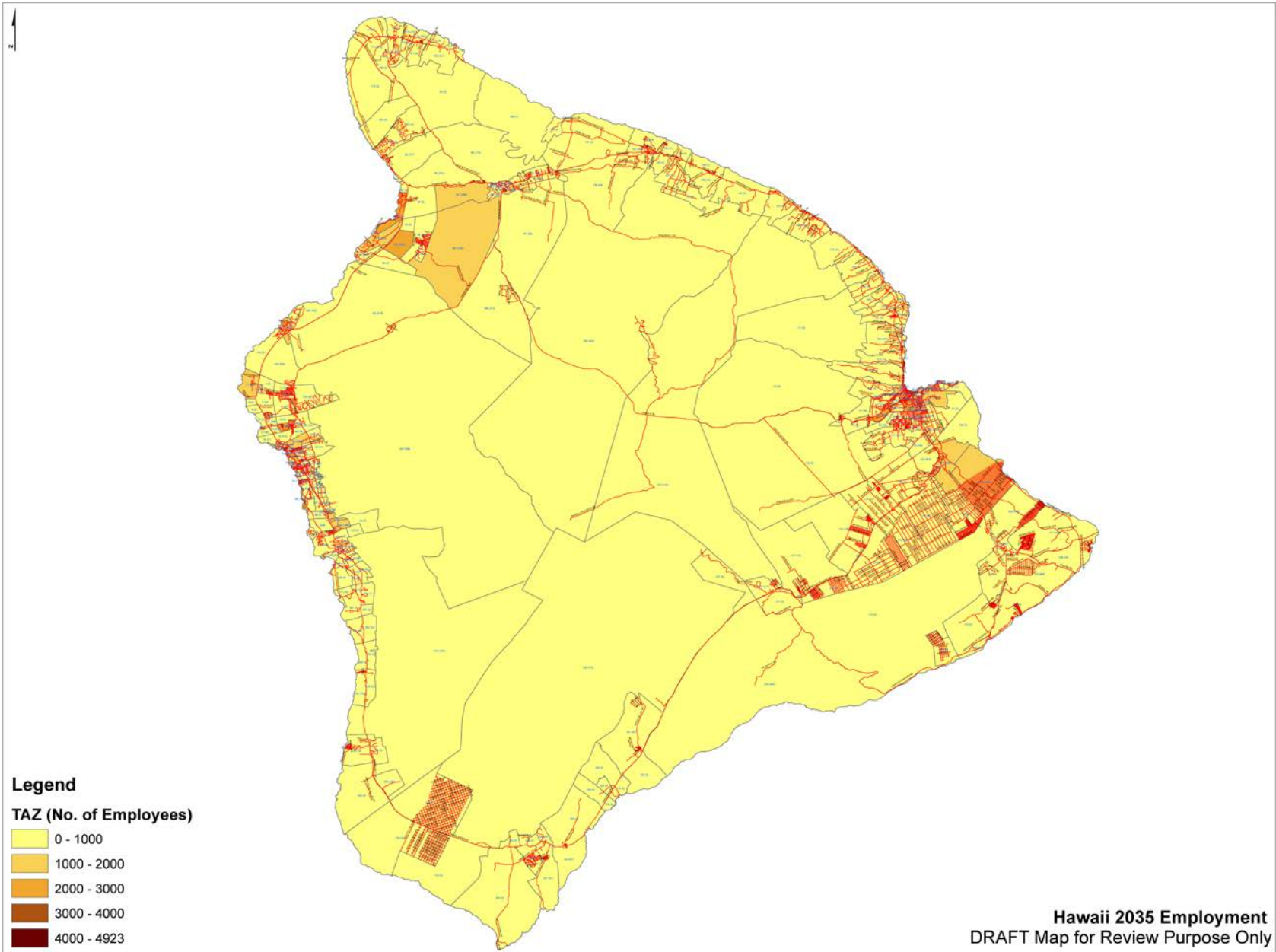


FIGURE 16
Year 2035 Employment

By Year 2020, the forecast estimates approximately 12,940 visitor accommodations on the Island of Hawaii, a growth of approximately 17.0 percent. By year 2035, approximately 14,880 visitor accommodations are projected, resulting in a 34.5 percent growth (CH2M HILL, 2012b).

Airport and Harbor Cargo

The Island of Hawaii airports are forecast to accommodate approximately 55,040 tons of cargo in Year 2020 and 68,420 tons in Year 2035 (CH2M HILL, 2012b). This forecast equates to approximately 18.5 percent increase in air cargo by Year 2020 and 47.3 percent increase by Year 2035.

Hilo Harbor and Kawaihae Harbor are forecast to accommodate approximately 3.3 million tons of cargo in Year 2020, which equates to an approximate 18.5 percent increase. By Year 2035, the harbors are forecast to accommodate roughly 4.1 million tons, which is approximately an increase of 47.3 percent (CH2M HILL, 2012b).

Forecast System Performance

The forecast transportation system performance is based on the baseline transportation system and the socioeconomic forecasts described in the previous sections. The travel demand model estimates future forecast traffic volumes and system characteristics. The demand model estimates of the future land transportation system operations are described and compared to the existing performance characteristics.

Vehicular Volumes

Average daily traffic volumes on Keeau-Pahoehoe Road (Highway 130) in 2020 would be approximately 31,400 vehicles per day in both directions, an increase of 46 percent compared to 2007 conditions. By 2035, daily volumes would be in the range of approximately 81,200 vehicles, or approximately 40,600 vehicles in each direction (100 percent increase). Daily vehicles on Hawaii Belt Road west of Hilo near Kurtistown in 2020 are forecast to be similar to existing conditions. Growth in the area does occur, but most of the increase in traffic would take the parallel Stainback Highway to enter or exit Hilo. By 2035, daily traffic on Hawaii Belt Road in the same location would reach approximately 23,600 vehicles per day.

Further west, volumes decrease due to lower population and household density.

Approximately 12,600 vehicles are forecast per day in both directions of Hawaii Belt Road approaching Hawaii Volcanoes National Park in 2020 (9,400 vehicles in 2035). By 2020, volumes on Hawaii Belt Road on the south side of the park through Captain Cook range between 4,000 and 15,000 daily vehicles. In 2035, the forecast volumes increase to between 5,300 vehicles near Naalehu and 18,900 daily vehicles near Honaunau.

Through Kona, the forecast average daily traffic volumes on Hawaii Belt Road (Highway 11) peak at approximately 41,900 vehicles per day in 2020 and 48,700 vehicles per day in 2035, while Kona Belt Road (Highway 180) carries up to 8,500 vehicles per day and 12,000 vehicles per day in 2020 and 2035, respectively. North of Kona, volumes on Queen Kaahumanu Highway (Highway 19) increase to approximately 29,900 vehicles per day by 2020 near the Kohala coast resorts, then gradually decrease through Waimea and Honokaa. In 2035, approximately 39,000 daily vehicles are expected on this same segment of Queen Kaahumanu Highway.

Highway Volume to Capacity Ratio and Level of Service

Tables 15 and 16 summarize the performance of the future modeled roadway system. The forecast increase in congested lane miles indicates an increase in vehicles on the Hawaii roadway network in 2020 and in 2035. In 2020, 8 percent of the network experiences V/C ratios of 1.0 or more (LOS F). This trend worsens to 15 percent of the network in 2035. Similar to 2007 conditions, most of the LOS F facilities are roadway links classified as principal arterials. Sixteen percent of all lane miles on links classified as principal arterials operate at LOS F in 2020, and 28 percent are expected to operate at LOS F in 2035. In 2020, approximately 11 percent of all minor arterial roadway links are forecast to operate at LOS F. This increases to approximately 19 percent of all minor arterials by the year 2035.

TABLE 15
2020 Daily Roadway Performance

Roadway Link Classification	Percentage of Lane Miles (2020)				Lane Miles
	V/C < 0.8 (LOS C or better)	0.8 ≤ V/C < 0.9 (LOS D)	0.9 ≤ V/C < 1.0 (LOS E)	1.0 ≤ V/C (LOS F)	
Principal Arterials	68%	12%	4%	16%	400
Minor Arterials	81%	3%	5%	11%	368
Collectors	93%	3%	2%	2%	892
Total	84%	5%	3%	8%	1660

CH2M HILL, 2012b

TABLE 16
2035 Daily Roadway Performance

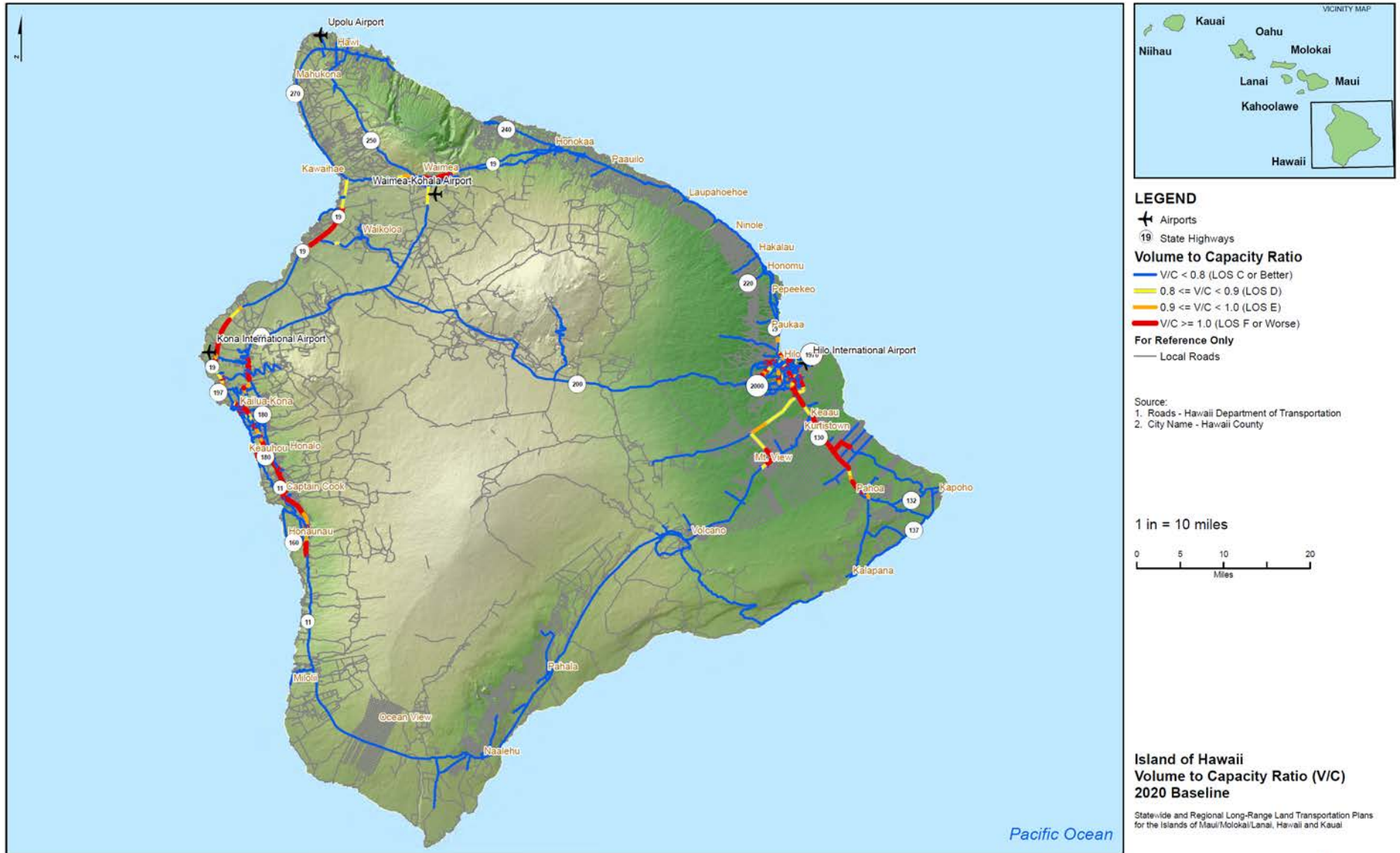
Roadway Link Classification	Percentage of Lane Miles (2035)				Lane Miles
	V/C < 0.8 (LOS C or better)	0.8 ≤ V/C < 0.9 (LOS D)	0.9 ≤ V/C < 1.0 (LOS E)	1.0 ≤ V/C (LOS F)	
Principal Arterials	58%	8%	6%	28%	400
Minor Arterials	69%	3%	9%	19%	368
Collectors	89%	2%	2%	7%	892
Total	77%	3%	5%	15%	1660

CH2M HILL, 2012b

The majority of arterial and collector roadways on Hawaii would operate at LOS C or better (V/C ratios of 0.8 or less) in both 2020 and 2035. This indicates that the majority of the 1660 modeled lane miles on the island would generally operate under uncongested conditions daily.

Figure 17 shows the 2020 forecast daily V/C ratios of modeled facilities on the Island of Hawaii. In 2020, Queen Kaahumanu Highway near the Kohala resorts is expected to worsen from LOS E in 2007 to LOS F due to increased traffic. South of Kona International Airport, LOS on Queen Kaahumanu Highway would improve from LOS F in 2007 to LOS D and LOS E in 2020 due to increased capacity from planned roadway widening improvements. The Hawaii Belt Road and Keeau-Pahoa Road in Hilo would continue to operate at LOS F in 2020, while the Stainback Highway would worsen from LOS C or better to LOS D and LOS E in 2020.

Figure 18 shows the 2035 forecast V/C ratios. In 2035, the segment of Queen Kaahumanu Highway from Kona to just north of Kona International Airport, and from Waikoloa through the Kohala coast to Kawaihae would worsen to either LOS E or LOS F. In Hilo, Stainback Highway and North Kulani Road would worsen to LOS F compared to 2020 and existing conditions. Portions of Hawaii Belt Road through Mountain View would also worsen to LOS F in 2035 compared to 2007 conditions.



Updated 2/12/2013



FIGURE 17
 Year 2020 Volume to Capacity Ratio

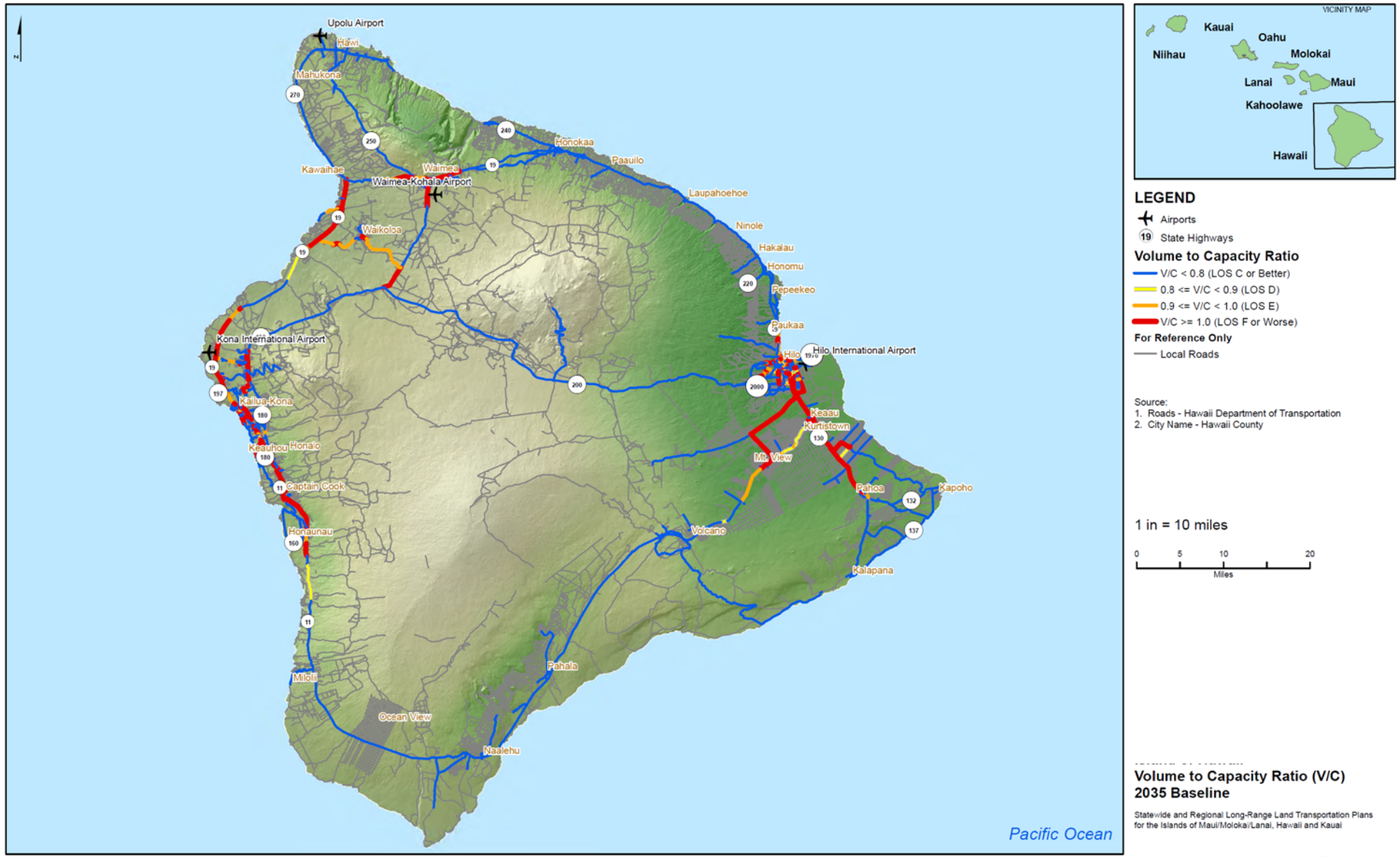


FIGURE 18
Year 2035 Volume to Capacity Ratio

Vehicle Trips

As shown in Tables 17 and 18, the total vehicle trips generated on Hawaii increase from 456,580 trips in 2007 to 601,540 trips in 2020 and 753,180 trips in 2035. Compared to 2007, overall vehicle trips are expected to increase by approximately 32 percent in 2020 and by approximately 65 percent in 2035. The North Kohala and Puna district would experience the most significant percentage growth in vehicle trips. From the North Kohala district, trips would increase from 8,690 total vehicle trips in 2007 to 14,020 trips in 2020 and 20,120 in 2035, which are growth rates of 61 percent and 132 percent, respectively. Compared to existing conditions, the Puna district would see an increase in vehicle trips in the range of approximately 47 percent in 2020 and 101 percent in 2035.

Approximately 32 percent of all trips generated in 2020, and 30 percent of trips in 2035, would travel to, from, or within the South Hilo district. Similar to 2007 conditions, the majority of forecast vehicle trips would be able to complete their trip purpose within the same district they were generated.

TABLE 17
2020 Daily Vehicle Trips by District

Planning District	Destination (2020)									
	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Total
North Kohala	7,960	4,000	220	20	200	60	20	1,490	50	14,020
South Kohala	4,000	54,690	4,400	490	3,920	1,330	450	10,060	550	79,890
Hamakua	220	4,400	7,170	410	820	220	80	1,030	60	14,410
North Hilo	20	490	410	630	1,110	160	20	40	10	2,890
South Hilo	200	3,920	820	1,110	145,730	38,510	620	830	120	191,860
Puna	60	1,330	220	160	38,510	50,760	910	210	20	92,180
Kau	20	450	80	20	620	910	9,000	3,400	2,100	16,600
North Kona	1,490	10,060	1,030	40	830	210	3,400	134,410	11,620	163,090
South Kona	50	550	60	10	120	20	2,100	11,620	12,070	26,600
Total	14,020	79,890	14,410	2,890	191,860	92,180	16,600	163,090	26,600	601,540

CH2M HILL, 2012b

TABLE 18
2035 Daily Vehicle Trips by District

Planning District	Destination (2035)									
	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Total
North Kohala	11,130	5,930	340	40	300	80	20	2,210	70	20,120
South Kohala	5,930	71,360	5,270	510	4,380	1,440	530	13,220	700	103,340
Hamakua	340	5,270	8,390	460	1,040	240	90	1,110	70	17,010
North Hilo	40	510	460	660	1,290	190	20	50	10	3,230
South Hilo	300	4,380	1,040	1,290	162,420	53,360	780	860	140	224,570
Puna	80	1,440	240	190	53,360	69,630	1,130	200	20	126,290
Kau	20	530	90	20	780	1,130	11,220	3,900	2,560	20,250
North Kona	2,210	13,220	1,110	50	860	200	3,900	166,530	15,220	203,300
South Kona	70	700	70	10	140	20	2,560	15,220	16,280	35,070
Total	20,120	103,340	17,010	3,230	224,570	126,290	20,250	203,300	35,070	753,180

CH2M HILL, 2012b

The future average daily trip length between districts is shown in Table 19 and Table 20. In 2020 and 2035, the average trip length between districts is expected to remain similar to existing conditions. An average trip length between the North Kohala district and the Kau district in 2020 would be approximately 119 miles. This same trip in 2035 would be approximately 116 miles due to differences in the roadway network. The average trip length between South Hilo and South Kona in both 2020 and 2035 would be approximately 97 miles.

The average length for all trips originating in the Kau district in 2020 and in 2035 is similar to existing at approximately 34 miles, while the average length for all trips originating in the South Hilo district is also similar to existing conditions at roughly 9 miles per trip.

TABLE 19
2020 Daily Average Vehicle Trip Length between Districts (Miles)

Planning District	Destination (2020)									
Origin	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Weighted Average
North Kohala	5	23	37	62	87	104	119	48	68	18
South Kohala	23	9	23	43	67	82	105	29	50	18
Hamakua	37	23	5	19	42	59	86	53	70	19
North Hilo	62	43	19	6	22	43	82	64	82	25
South Hilo	84	67	42	22	3	18	45	78	97	9
Puna	103	82	58	42	18	9	22	89	102	15
Kau	119	105	85	82	45	22	14	60	34	34
North Kona	48	29	53	64	78	89	60	5	13	10
South Kona	68	50	70	82	97	102	34	13	6	13
Weighted Average	18	18	19	25	9	15	34	10	13	12

CH2M HILL, 2012b

TABLE 20
2035 Daily Average Vehicle Trip Length between Districts (Miles)

Planning District	Destination (2035)									
Origin	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Weighted Average
North Kohala	5	23	37	61	84	103	116	49	68	18
South Kohala	23	9	23	43	67	82	107	30	50	18
Hamakua	37	23	5	19	42	59	86	53	69	19
North Hilo	61	43	19	6	22	43	82	64	81	26
South Hilo	82	66	42	22	3	18	45	79	97	9
Puna	103	82	59	43	18	9	21	98	102	15
Kau	116	107	87	82	45	21	14	60	33	33
North Kona	49	30	53	64	79	97	60	5	14	10
South Kona	68	50	69	81	97	102	33	13	6	13
Weighted Average	18	18	19	26	9	15	33	10	13	13

CH2M HILL, 2012b

The forecast daily vehicle miles traveled increases from 4,990,900 vehicle miles in 2007 to 6,617,700 vehicle miles in 2020 on the Island of Hawaii. This equates to a 33 percent increase

overall. In 2035, 8,585,900 vehicle miles will be traveled island-wide, for an increase of approximately 72 percent between 2007 and 2035. Approximately 10 to 11 percent of the daily vehicle miles traveled would occur during the p.m. peak hour.

Average Trip Time

The overall, island-wide, average trip time per vehicle trip would rise from 26 minutes in 2007 to 40 minutes in 2020, and to 133 minutes in 2035 as shown in Tables 21 and 22. High average trip times are the result of increased traffic and congestion, primarily on roadways between the Hilo and Puna areas and along the Kohala coast. Although future trip times for vehicles that must use Hawaii Belt Road in Hilo or Queen Kaahumanu Highway in Kona and the Kohala coast would be greater than existing, it is unlikely that average trip times would reach the levels presented in Table 20 and 21 because people would likely change their trip pattern or behavior to adjust to congestion, such as not taking the trip. Also, if congestion were to reach the levels forecasted on Highway 130 this would likely affect the land use growth in the Puna area. Based on the land use forecasts the traffic levels would increase to create severe congestion in these areas, which results in traffic experiencing very low speeds for extended periods of the day.

TABLE 21
2020 Daily Average Vehicle Trip Time between Districts (Minutes)

Planning District	Destination (2020)									
Origin	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Weighted Average
North Kohala	11	39	66	98	120	249	208	81	133	31
South Kohala	39	18	41	66	87	213	184	53	109	34
Hamakua	65	40	12	29	61	190	161	89	137	36
North Hilo	97	65	29	10	34	163	160	103	153	45
South Hilo	120	87	61	34	8	127	101	103	158	36
Puna	249	213	190	163	128	53	52	219	220	90
Kau	208	184	161	160	103	52	27	121	58	66
North Kona	80	52	90	103	103	218	121	12	44	22
South Kona	133	109	137	152	158	220	59	44	19	36
Weighted Average	31	34	36	45	36	89	66	22	36	40

CH2M HILL, 2012b

TABLE 22
2035 Daily Average Vehicle Trip Time between Districts (Minutes)

Planning District	Destination (2035)									
Origin	North Kohala	South Kohala	Hama-kua	North Hilo	South Hilo	Puna	Kau	North Kona	South Kona	Weighted Average
North Kohala	11	50	94	125	149	736	350	124	232	44
South Kohala	50	32	56	83	105	687	334	79	204	57
Hamakua	92	54	12	30	62	644	302	119	219	51
North Hilo	123	82	30	10	35	600	302	119	221	79
South Hilo	147	104	62	35	9	573	246	118	249	150
Puna	739	691	649	605	577	199	119	657	588	377
Kau	351	336	306	306	251	119	27	202	72	103
North Kona	123	79	120	119	118	654	202	15	102	33
South Kona	232	204	219	220	249	586	72	102	41	76
Weighted Average	44	57	51	80	151	375	103	33	76	133

CH2M HILL, 2012b

Daily vehicle hours traveled in 2020 and 2035 are forecasted to increase at a faster rate than vehicle miles traveled in the future years. A total of 352,180 daily vehicle hours of travel are forecasted in 2020, which is over 115 percent greater than 2007 conditions. In 2035, over 1.5 million daily vehicle hours would be spent by automobiles and trucks on Hawaii's arterials or collectors. These increases in vehicle hours traveled are the results of severe congestion on a number of roadways such as Highway 130.

Travel Time

Figures 19 through 22 depict the estimated PM peak vehicle travel times from Kona and Hilo to locations on the island in 2020 and 2035. In 2020, travel times from Kona to the Kohala coast would similar to existing, at approximately 60 to 75 minutes. Travel times from Kona to areas south of Honaunau would increase significantly (by at least 60 minutes per trip compared to 2007 conditions) due to increased vehicle demand and limited capacity on Hawaii Belt Road. Because Hawaii Belt Road is the primary route from Kona to the south, all vehicles must access this roadway in order to reach points south of Captain Cook. The travel demand model forecasts congestion on Hawaii Belt Road between Keauhou and Honaunau, with especially high V/C ratios (1.0 or higher) and extremely low travel speeds on the segment of roadway from Highway 180 through Halekii Street to State Highway 160/Napoopoo Road. Vehicles experience long travel times as they pass through this area of high congestion and estimated travel times to the south consequently increase to greater than 120 minutes.

By 2035, due to increases in forecasted traffic volumes, many trips to areas outside of Kona town would take over 120 minutes. This increase in p.m. peak travel time is a result of severe congestion. Trips leaving Kona must use Queen Kaahumanu Highway, Hawaii Belt Road, or Mamalahoa Highway. As shown on Figure 18, these roadways are congested and primarily

have V/C ratios of 1.0 or higher. This congestion causes extremely low forecasted operating speeds and results in long travel times. All trips from Kona in the p.m. peak hour would likely use at least one of these roadways, and therefore will experience long travel times.

North of Kona severe congestion occurs on Hawaii Belt Road north of the Mamalahoa Highway. Traffic volumes from both of these facilities must merge onto one facility, which causes congestion. This congestion continues through Kalaoa during the p.m. peak hour. Trips using the Hawaii Belt Road in this area are expected to experience very slow speeds in 2035. This results in a dramatic change in travel time for those areas that must use this section of Hawaii Belt Road. Some areas, such as locations that have access via Kaiminani Drive, have the option of traveling on Queen Kaahumanu Highway instead of Hawaii Belt Road to travel from Kona. But Queen Kaahumanu Highway would also experience severe congestion north of Keahole Airport Road during the p.m. peak hour due to high traffic volumes. Therefore northbound trips from Kona that use Queen Kaahumanu Highway will also experience slow speeds and have extremely long travel times through the Kohala coast.

Trips from Hilo to areas to the south are forecasted to take over 2 hours in both 2020 and 2035. The dramatic change in travel time within a relatively short distance is the result of severe congestion. As shown in Figures 17 and 18, Hawaii Belt Road (Highway 11) and Keeau-Pahoa Road (Highway 130) will be severely congested with V/C ratios over 1.0. Trips that have to travel along Hawaii Belt Road in this area are expected to have a dramatic increase in their travel times due to increases in traffic volumes and congestion, and reduced speed. During the p.m. peak period severe congestion is expected on Hawaii Belt Road between Stainback Highway and Keaau Pahoa Bypass Road. Trips heading to Puna must use this segment of road. Also, trips are expected to experience severe congestion on Keeau-Pahoa Bypass Road and Keeau-Pahoa Road as these are the only access routes to Puna.

Similar to existing conditions, this congestion causes low operating speeds and results in extremely long travel times for trips that have to use these roadways. The Puna area is expected to grow by approximately 17,000 households between 2007 and 2035 and this will compound the long travel times on Keeau-Pahoa Road which is currently experiencing congestion in 2007. Many of the trips made by the households in the Puna area will travel to and from Hilo for work and services. These trips must use roads which are forecasted to be over capacity and therefore travel times are forecasted to increase. Figures 21 and 22 show the forecasted p.m. peak hour travel times from Hilo.

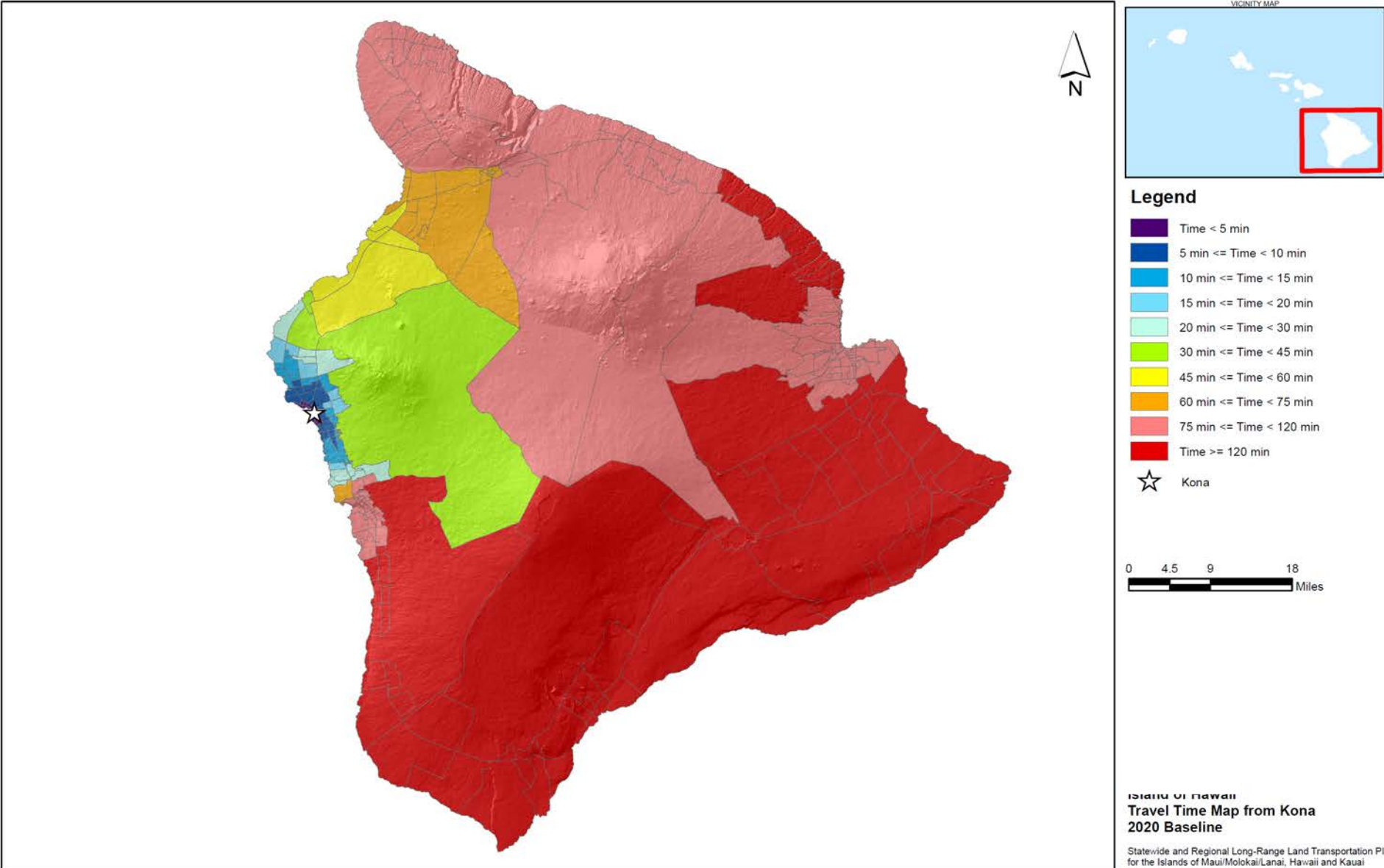


FIGURE 19
2020 Travel Time from Kona
CH2M HILL, 2012b

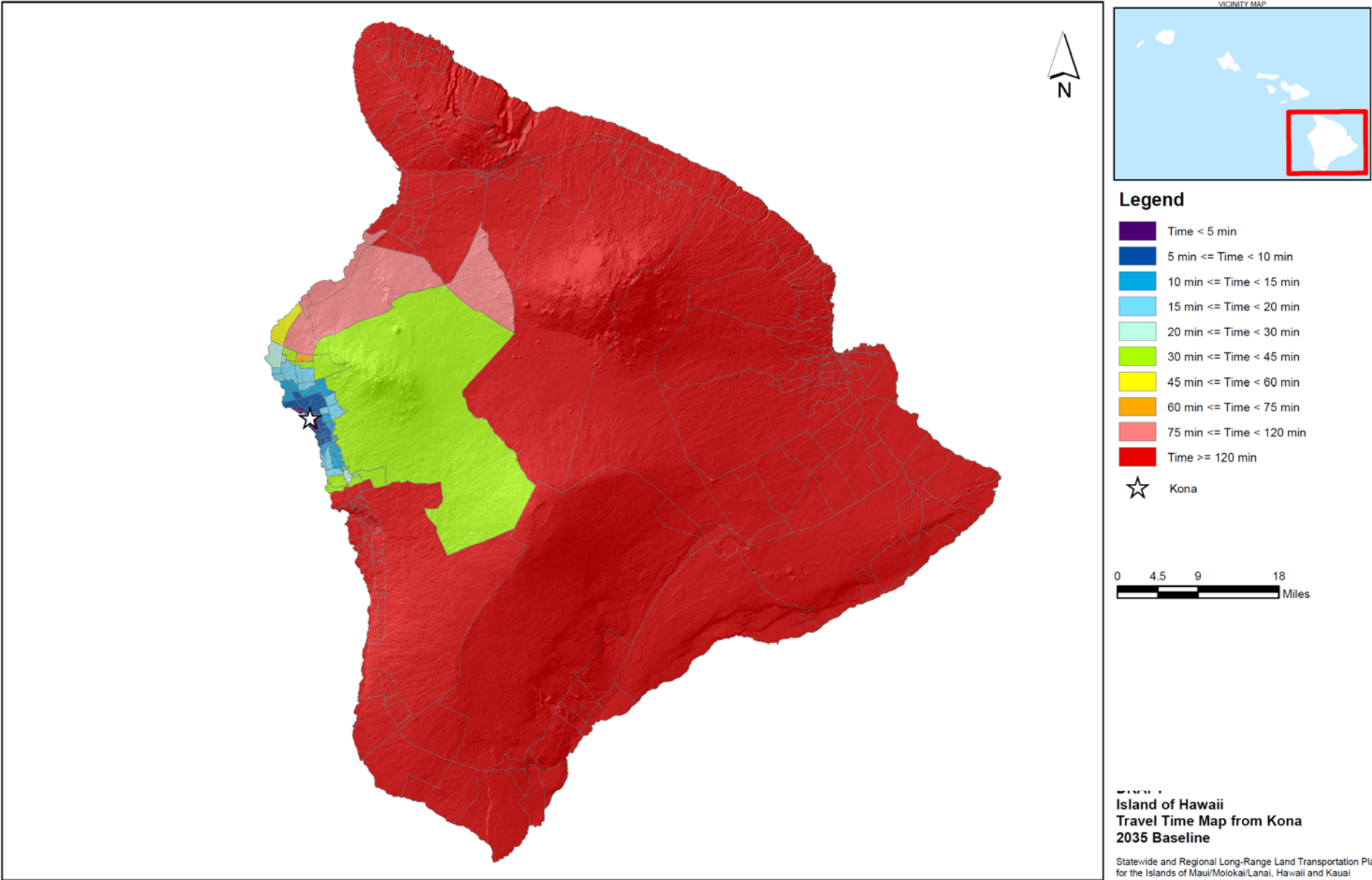


FIGURE 20
2035 Travel Time from Kona
CH2M HILL, 2012b

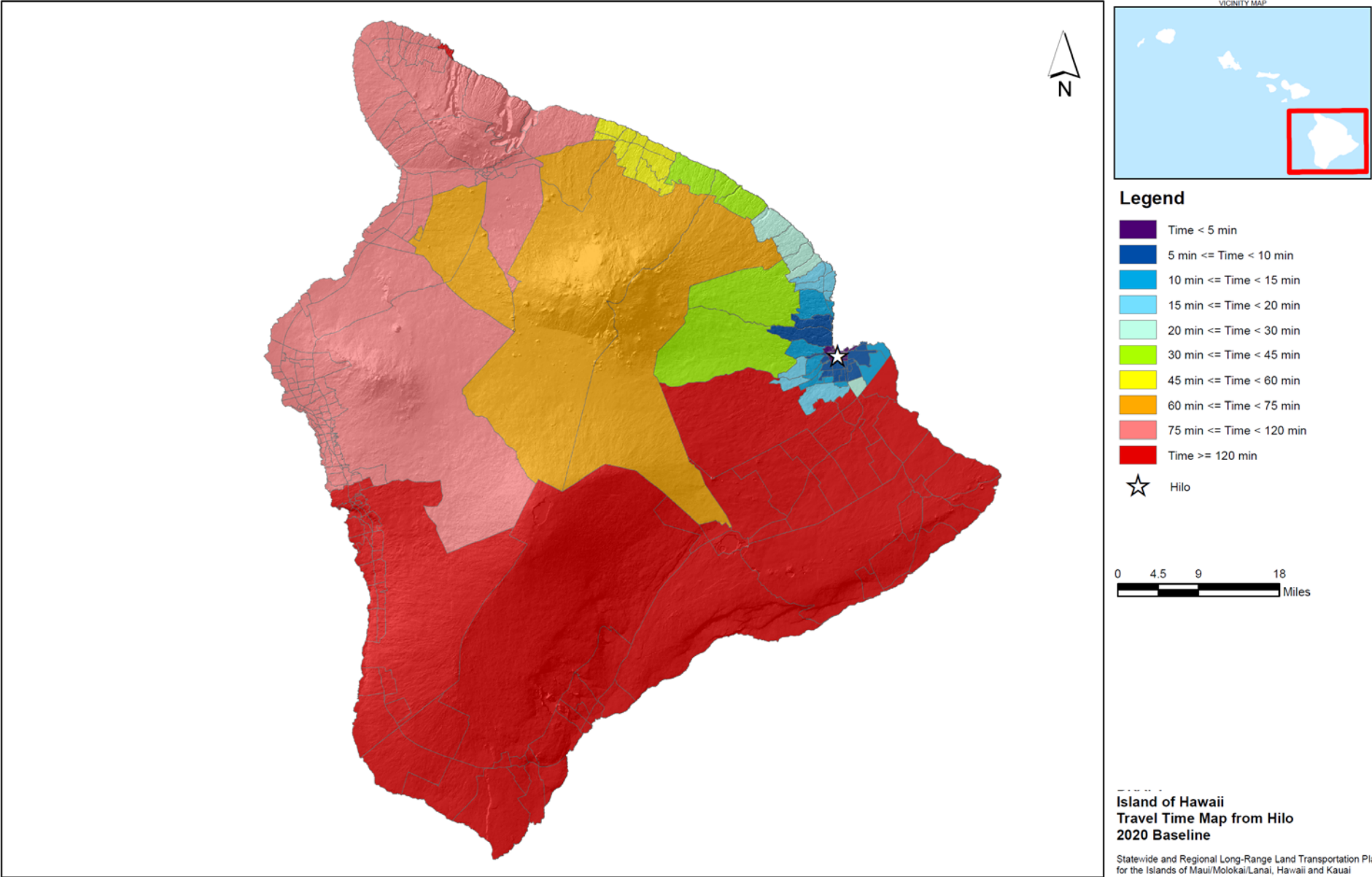


FIGURE 21
2020 Travel Time from Hilo
CH2M HILL, 2012b

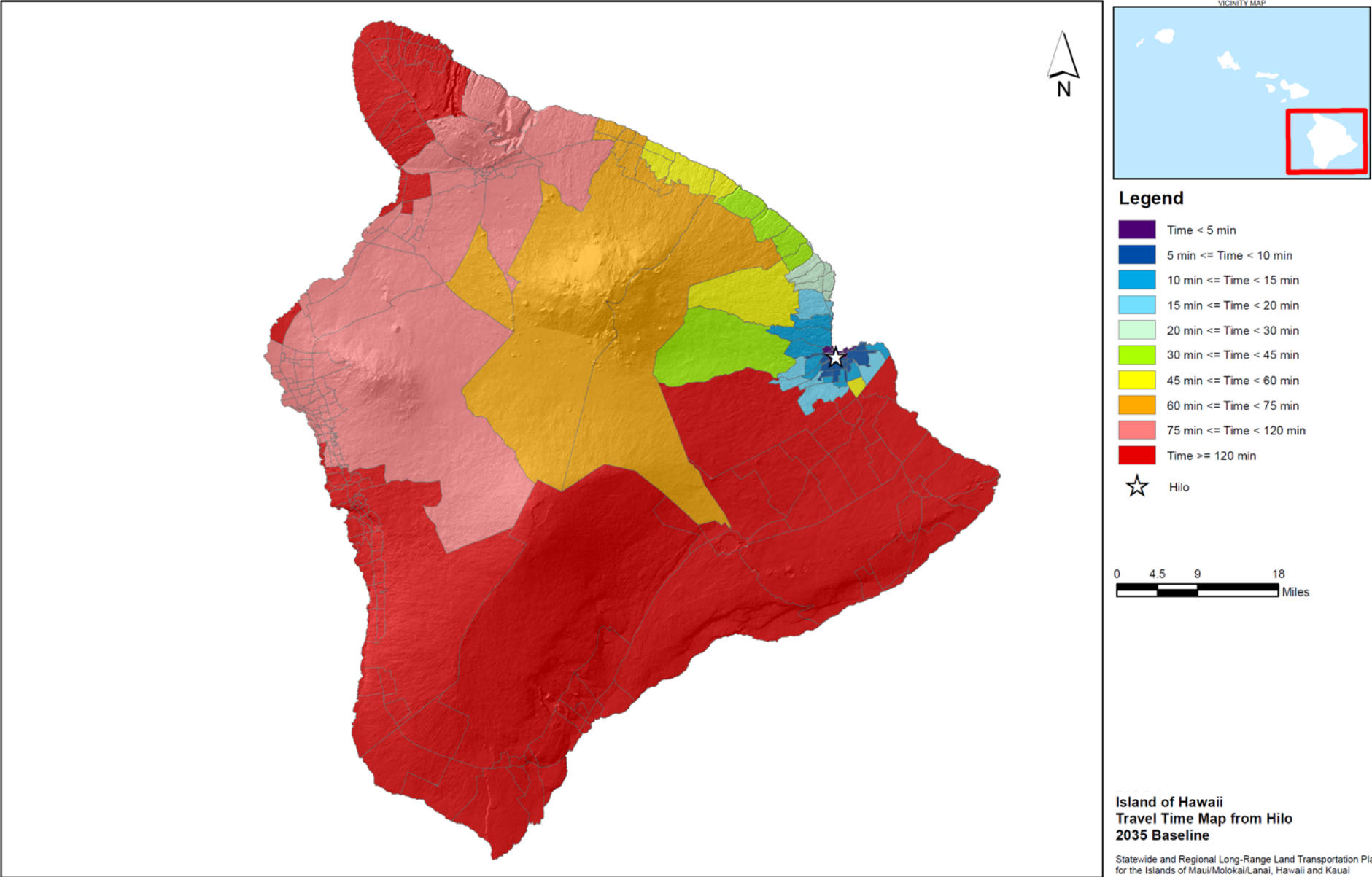


FIGURE 22
2035 Travel Time from Hilo
CH2M HILL, 2012b

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Attachment 1
Land Use and Socioeconomic Data Methodology

Statewide Long-Range Land Transportation Plan and the Regional Long-Range Land Transportation Plans for Maui, Hawaii, and Kauai Counties

Land-Use and Socioeconomic Data Methodology

PREPARED FOR: Hawaii Long-Range Land Transportation Plan Project Management Team

PREPARED BY: Neha Rathi/CH2M HILL

DATE: Updated May 4, 2012

Introduction

This memorandum discusses the methodology used to develop and process the 2007 land use and socioeconomic data for the three islands: Maui, Hawaii, and Kauai. The raw data for households, employment, schools, visitor accommodations, visitor attractions, airports, and harbors have been processed to prepare input for the travel demand modeling and traffic forecasting.

This socioeconomic data is available in many forms and from many sources. Typically, the data must provide at least one source for estimating trip productions and one source for estimating trip attractions. The trip productions are traditionally a function of the number of persons or households within an area. Trip attractions are related to activities outside the house such as employment, school, shopping or recreation within an area. This socioeconomic data is summarized at the traffic analysis zone (TAZ) level for the 2007 base year and shown in Appendix A through C.

Data and Source of Data

The land use and socioeconomic data needed for TAZs by the travel demand model are listed in Table 1 along with the source for the data.

Table 1 Land-Use and Socioeconomic Data and Sources

Data	Description	Source Details
Household	Assessor Data – Residential Buildings and Apartments data for each parcel	County information from DWELDAT - Residential Building Extract COMINTEXT - Commercial Building Extract Kauai – April/May 2011 Hawaii- March/April 2011 Maui – March/April 2011
School Enrollment	Hawaii Department of Education (Website: http://doe.k12.hi.us/reports/enrollment.htm)	Enrollment 2007-2008 (Fall 2008) – “Enroll 07-08 w/ all Charter.xls”
Employment	Geo-coded point data from Hawaii Department of Labor and Industrial Relations	Second Quarter 2007 employment data “EQUIC72c”
Visitor Attraction	Hawaii State Department of Business, Economic Development and Tourism (DBEDT) (Website: http://hawaii.gov/dbedt/) – The State of Hawaii Data book	2008 State of Hawaii Data Book – Section 7 (Recreation and Travel) Table 7.43 – Attendance at museums and other cultural attractions : 2006 to 2008 “Sectio07.pdf” 2007 Hawaii State Parks Survey prepared for Hawaii Tourism Authority (December 2007) “HTAPRO-Report-12-01-2007.pdf”
Visitor Accommodation	Assessor Data – Hotels, Motels and Dormitory data for each parcel Visitor Plan Inventory DBEDT (Website: http://hawaii.gov/dbedt/info/visitor-stats/visitor-plant/)	County data from COMINTEXT - Commercial Building Extract Kauai – April/May 2011 Hawaii- March/April 2011 Maui – March/April 2011 Totals from Visitor Plant Inventory 2008 – Table 5: Inventory by Area and Unit Type “vpi2008.pdf”
Airport Tonnage	Hawaii Department of Transportation, Airports Division (Website: http://hawaii.gov/dot/airports/library/publications-and-statistics/) - Annual-Air-Traffic-Statistics	The State of Hawaii Airport Activity Statistics by Calendar Year – Table : Calendar Year 2007 Air Traffic Statistics “annual-air-traffic-statistics.pdf”
Airport Passenger	Hawaii Department of Transportation, Airports Division (Website: http://hawaii.gov/dot/airports/library/publications-and-statistics/) - Annual-Air-Traffic-Statistics	The State of Hawaii Airport Activity Statistics by Calendar Year – Table : Calendar Year 2007 Air Traffic Statistics “annual-air-traffic-statistics.pdf”
Harbor Tonnage	Hawaii Department of Transportation, Harbors Division	Data provided by Dean Watase from Harbor Division in email on 05/09/2011
Harbor Passenger	Hawaii State Department of Business, Economic Development and Tourism (Website: http://hawaii.gov/dbedt/info/visitor-stats/visitor-research/) – Annual Visitor Research Report	2007 Annual Visitor Research Report – Table 76: 2007 Total Cruise Passengers by MMA “2007-annual-visitor-research.pdf”

The majority of trips in the travel demand models are produced by households and attracted by employment across each island. Table 2 summarizes the base year household

and employment data for the three islands. Appendix A through C lists all of the socioeconomic data used in the travel demand model by TAZ for each island.

Table 2 2007 Household and Employment Data by Island

Island	Households	Employment			Total
		Retail	Service	Other	
Hawaii	62,865	9,403	25,438	33,503	68,344
Kauai	22,870	4,174	11,863	14,352	30,389
Maui	47,203	9,474	24,467	35,748	69,689

Households

The County assessor data was used to develop the estimate of housing units. The residential buildings and the commercial buildings datasets were used to estimate the 2007 housing units.

Each record in the residential buildings dataset was assigned an estimated number of units based on the square footage, number of rooms, number of bathrooms, and type of building. The numbers of units for each record for apartments from the commercial buildings dataset in the assessor data were estimated using an average of 700 square feet of area for each unit based on reviewing the information in the dataset.

The residential buildings dataset includes all the housing records for developments up to year 2011. Only the development records up to 2007 were included in estimating housing units for the year 2007.

The housing units' data from the residential buildings dataset and apartments from the commercial buildings dataset were aggregated to census tract level for comparison review against 2000 and 2010 census data. The review showed that the 2007 summary from the assessor data was not matching the census data. To align the housing unit estimates from the assessor data and the census, an interpolation between 2000 and 2010 census data was done to estimate 2007 housing units by census tract. This approach was used on all three islands.

The occupancy rates for each census tract were calculated from the 2010 census data and applied to the estimated 2007 housing units by census tracts. This gave an estimate of 2007 households for each island by census tract. The households were then redistributed proportionally to the parcels from assessor data. The final household numbers were aggregated from the parcel level to TAZ level for each island for the land use input.

The data and methodology used to estimate households by TAZs is therefore different than a previous version of the Maui model, which used household estimates directly from the 2000 census.

School Enrollment

The 2007 school enrollment data from the Department of Education website was aggregated to TAZ level for each island.

Employment

The Department of Labor and Industrial Relations (DLIR) provided employment data from the second quarter of year 2007 for the three islands. The data for the first month of the second quarter, April 2007, was processed for the land use inputs. The data from DLIR provided information on the employee count, employer ownership, state government department codes, North American Industry Classification System (NAICS) employment group codes, place address and X-Y coordinates.

A review of the data showed that a significant percentage of the data points were not geo-located correctly or were not geo-located. To address these issues, only the data points with ten or more employees were further studied to geo-locate using the NAICS code definition and internet search. The data points which were not geo-located and have less than ten employees were distributed proportionally for each employment group to the TAZs which have the same employment group.

The school and education program employees were distributed among the schools on each island, proportionally based on school enrollment levels. The library employees were equally distributed among the libraries on each island.

The geo-located data points were then aggregated to the TAZ level in different employment groups. The employment data for the project were categorized into three groups – Service, Retail and Other. The groups were identified based on the NAICS codes and are described in Table 3. The employment groups and corresponding NAICS codes are the same categorization used in a previous version of the Maui model developed by HNTB and are consistent across the three island models.

TABLE 2
Employment Groups and NAICS Codes

NAICS Code Range	Description	Employment Group
100000 - 219999	Agriculture, Forestry, Fishing and Hunting and Mining	Other
220000 - 229999	Utilities	Other
230000 - 299999	Construction	Other
300000 - 399999	Manufacturing	Other
400000 - 439999	Wholesale	Other
440000 - 459999	Retail	Retail
480000 - 499999	Transportation and Warehousing	Other
500000 - 519999	Information	Service
520000 - 529999	Finance and Insurance	Service
530000 - 539999	Real Estate and Rental and Leasing	Service
540000 - 549999	Professional, Scientific, Technical Services	Service
550000 - 559999	Management of Companies and Enterprises	Service
560000 - 599999	Administration, Support, Waste Management and Remediation	Service
600000 - 619999	Educational Services	Other
620000 - 699999	Health Care and Social Assistance	Service
700000 - 719999	Arts, Entertainment and Recreation	Service
720000 - 799999	Accommodations and Food Service	Other
800000 - 899999	Private Services	Service
900000 - 999999	Public Services	Service

Visitor Attractions

The visitors' data at parks and cultural attractions from the Hawaii State Data Book available on the DBEDT website was used for estimating the visitor attractions. The parks and cultural attraction sites were geo-located and assigned the visitor counts from the data book. The geo-located points were then aggregated to TAZ level for an estimate of visitor attractions on each island as per the Maui model specification.

Visitor Accommodations

The commercial buildings dataset from the assessor data was processed to estimate the 2007 visitor accommodations. The records for hotels, motels and dormitories by each parcel were used in estimating the total units for visitor accommodations. The numbers of units for each record for visitor accommodation in the assessor data were estimated using an average of 400 square feet of area for each unit based on reviewing the information in the dataset. The number of units for each parcel was then aggregated to TAZ level for each island. The island totals were compared to the Visitor Plant Inventory from DBEDT and the TAZ data was adjusted up to match.

The methodology used to estimate visitor accommodations by TAZs is different than the previous version of the Maui model, which used individual records from the Visitor Plant Inventory. The records were geocoded and aggregated to TAZ.

Airport and Harbor Data

The airport and harbor data are consistent across the three islands and accounts for interaction between the islands. Tonnage and passengers leaving one of the three islands and arriving at another is included in the data. The travel demand models take into account the arrival and departures at each harbor/airport. The models do not link flows from one model to another, rather the models account for the total in or out for one island. Each island model operates independently of the other two island models.

Airport Tonnage: The airport tonnage data from the Hawaii Department of Transportation, Airports Division website was assigned to the corresponding TAZs on each island.

Airport Passengers: The airport passenger data from the Hawaii Department of Transportation, Airports Division website was assigned to the corresponding TAZs on each island.

Harbor Tonnage: The harbor tonnage data provided by the Hawaii Department of Transportation, Harbor Division was assigned to the corresponding TAZ on each island.

Harbor Passengers: The harbor passenger data from the Hawaii State Department of Business, Economic Development and Tourism was assigned to the corresponding TAZ on each island.

Appendixes A through C – 2007 Socioeconomic Data

Each islands 2007 base year socioeconomic data is shown in appendixes A, B, and C by traffic analysis zone (TAZ). Below is a glossary of the abbreviations used in tables.

<i>Glossary</i>	
HH	Households
SCHL ENR	School Enrollments
OTHER EMP	Other Employment
RETAIL EMP	Retail Employment
SERVICE EMP	Service Employment
TOT EMP	Total Employment
VIS ATT	Visitor Attractions
VISITOR ACCOM	Visitor Accommodations
AIR TONS	Air Tonnage
AIR PASNGR	Air Passenger
HARBOR TONS	Harbor Tonnage
HARBOR PSNGR	Harbor Passenger

Appendix A – Kauai Socioeconomic Data

Kauai Island - Socio-Economic Data Year 2007													
TAZ				EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
1	267	681	32	105	61	701	867	169,700	0	0	0	0	0
2	412	1,051	307	34	0	9	43	0	0	0	0	0	0
3	16	41	0	8	0	0	8	0	0	0	0	0	0
4	195	497	0	5	0	0	5	0	0	0	0	0	0
5	277	706	0	12	0	5	17	0	0	0	0	0	0
6	207	528	0	44	47	71	162	63,500	77	0	0	0	0
7	97	247	438	49	0	219	268	0	0	0	0	0	0
8	381	972	791	198	0	69	267	104,975	51	0	0	0	0
9	242	617	47	122	25	158	305	734,600	0	0	0	0	0
10	145	360	0	139	48	52	239	79,500	0	0	0	0	0
11	3	7	0	0	0	0	0	0	0	0	0	0	0
12	75	186	0	2	0	0	2	0	0	0	0	0	0
13	215	533	0	251	10	11	272	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
16	64	159	0	0	0	2	2	0	0	0	0	0	0
17	0	0	0	56	45	5	106	0	0	0	0	101,516	0
18	70	174	0	0	0	10	10	0	0	0	0	0	0
19	0	0	0	208	0	54	262	0	0	0	0	0	0
20	42	104	0	1	0	9	10	0	0	0	0	0	0
21	88	218	0	40	5	34	79	0	0	0	0	0	0
22	662	1,642	0	10	0	0	10	0	0	0	0	0	0
23	96	238	0	0	0	0	0	0	0	0	0	0	0
24	596	1,697	370	41	0	2	43	0	0	0	0	0	0
25	3	9	0	20	16	20	56	0	0	0	0	0	0
26	108	308	0	0	0	0	0	0	0	0	0	0	0
27	125	356	0	0	0	0	0	0	0	0	0	0	0
28	10	28	0	0	0	7	7	0	0	0	0	0	0
29	329	937	0	19	8	95	122	0	0	0	0	0	0
30	302	860	512	299	16	35	350	0	0	0	0	0	0
31	298	849	0	40	5	35	80	0	0	0	0	0	0
32	482	1,372	0	23	10	1	34	0	0	0	0	0	0
33	102	290	0	119	36	151	306	0	0	0	0	0	0
34	419	1,193	0	1	0	129	130	0	0	0	0	0	0
35	199	522	0	85	114	13	212	0	0	0	0	0	0
36	162	425	0	8	0	10	18	0	0	0	0	0	0
37	382	1,001	0	204	29	67	300	0	0	0	0	0	0
38	69	181	180	25	0	112	137	0	0	0	0	0	0
39	338	886	0	16	2	9	27	0	0	0	0	0	0
40	60	171	0	30	26	40	96	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0
42	123	326	0	3	0	9	12	0	0	0	0	0	0
43	59	157	0	160	79	86	325	0	0	0	0	0	0
44	97	257	0	305	118	55	478	0	0	0	0	0	0
45	603	1,600	0	2,046	106	302	2,454	0	3,147	0	0	0	0
46	38	101	0	34	2	25	61	0	0	0	0	0	0
47	1	3	0	0	0	0	0	0	0	0	0	0	0
48	15	53	0	28	0	192	220	0	0	0	0	0	0
49	553	1,940	0	378	9	253	640	0	0	0	0	0	0
50	13	46	0	474	97	126	697	888,100	0	0	0	0	0

Kauai Island - Socio-Economic Data Year 2007													
TAZ	HH	POP	SCHL ENR	EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
51	6	21	0	273	0	0	273	0	0	0	0	0	0
52	219	768	949	578	285	106	969	0	0	0	0	0	0
53	201	705	0	4	0	0	4	0	0	0	0	0	0
54	102	358	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	93	92	138	323	0	0	0	0	905,594	455,865
56	137	481	0	14	356	57	427	0	0	0	0	0	0
57	0	0	0	156	411	547	1,114	0	0	0	0	0	0
58	288	775	0	78	9	102	189	2,895	0	0	0	0	0
59	73	196	0	4	0	0	4	0	0	0	0	0	0
60	122	328	1,271	189	0	8	197	0	0	0	0	0	0
61	206	554	0	24	56	33	113	0	0	0	0	0	0
62	148	398	0	160	100	355	615	0	13	0	0	0	0
63	286	770	0	67	39	110	216	0	0	0	0	0	0
64	414	1,114	905	741	202	2,270	3,213	21,373	29	0	0	0	0
65	452	1,216	0	1,192	103	274	1,569	0	1,356	0	0	0	0
66	1	3	0	461	8	540	1,009	88,400	0	14,721	2,955,394	0	0
67	131	353	0	24	440	44	508	0	0	0	0	0	0
68	447	1,568	523	92	24	57	173	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0
70	440	1,543	0	336	22	1,072	1,430	0	2	0	0	0	0
71	260	912	0	4	0	3	7	0	0	0	0	0	0
72	441	1,157	0	560	161	50	771	0	1,842	0	0	0	0
73	235	617	0	41	0	46	87	0	0	0	0	0	0
74	820	2,224	0	65	4	40	109	0	0	0	0	0	0
75	256	694	0	7	5	8	20	0	0	0	0	0	0
76	364	987	0	47	8	69	124	0	0	0	0	0	0
77	147	386	0	1	0	5	6	0	0	0	0	0	0
78	416	1,092	0	3	0	0	3	0	132	0	0	0	0
79	156	409	0	10	0	0	10	0	0	0	0	0	0
80	12	31	678	185	19	60	264	17,970	0	0	0	0	0
81	26	77	0	311	262	988	1,561	0	0	0	0	0	0
82	377	1,122	0	133	25	22	180	0	0	0	0	0	0
83	286	851	0	299	41	70	410	0	0	0	0	0	0
84	299	890	1,909	131	10	64	205	0	47	0	0	0	0
85	13	39	0	41	7	38	86	0	0	0	0	0	0
86	349	1,039	0	58	0	29	87	0	0	0	0	0	0
87	481	1,432	0	24	0	8	32	0	0	0	0	0	0
88	234	697	0	353	278	173	804	0	0	0	0	0	0
89	347	941	0	29	0	17	46	0	0	0	0	0	0
90	137	422	0	0	0	11	11	0	0	0	0	0	0
91	200	616	0	7	0	4	11	0	0	0	0	0	0
92	592	1,762	0	19	2	158	179	0	0	0	0	0	0
93	48	143	0	115	0	4	119	0	0	0	0	0	0
94	54	166	0	15	0	6	21	0	0	0	0	0	0
95	21	65	0	0	0	0	0	0	0	0	0	0	0
96	171	526	0	0	0	0	0	0	0	0	0	0	0
97	117	360	0	0	0	0	0	0	0	0	0	0	0
98	63	194	0	0	0	0	0	0	0	0	0	0	0
99	58	179	49	5	0	0	5	0	0	0	0	0	0
100	4	12	0	0	0	0	0	0	0	0	0	0	0

Kauai Island - Socio-Economic Data Year 2007													
TAZ				EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
101	28	86	0	46	16	4	66	0	0	0	0	0	0
102	48	148	0	0	0	0	0	0	0	0	0	0	0
103	152	468	0	0	0	0	0	0	0	0	0	0	0
104	106	326	0	0	0	0	0	0	0	0	0	0	0
105	38	100	0	25	0	1	26	0	0	0	0	0	0
106	47	124	0	1	8	33	42	0	0	0	0	0	0
107	55	145	0	32	15	183	230	478,000	0	0	0	0	0
108	373	986	313	224	35	86	345	0	0	0	0	0	0
109	92	243	0	5	0	12	17	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0
111	137	362	0	92	0	39	131	0	0	0	0	0	0
112	44	116	0	0	0	12	12	0	0	0	0	0	0
113	76	201	0	0	6	0	6	0	0	0	0	0	0
114	35	93	0	0	6	89	95	0	0	0	0	0	0
115	235	621	0	58	0	19	77	0	1,058	0	0	0	0
116	638	1,687	0	210	0	29	239	0	0	0	0	0	0
117	215	568	0	394	1	3	398	0	854	0	0	0	0
118	140	370	0	133	0	19	152	0	0	0	0	0	0
119	155	410	0	6	0	16	22	0	0	0	0	0	0
120	75	198	0	67	40	351	458	0	85	0	0	0	0
121	4	11	0	0	0	0	0	0	0	0	0	0	0
122	23	61	222	0	0	0	0	592	0	0	0	0	0
123	170	453	0	468	164	198	830	0	0	0	0	0	0
124	10	27	0	0	0	0	0	0	0	0	0	0	0
125	73	195	0	0	0	0	0	0	0	0	0	0	0
126	132	352	0	0	0	0	0	0	0	0	0	0	0
127	61	163	0	0	0	0	0	0	0	0	0	0	0
128	9	24	0	0	0	0	0	0	0	0	0	0	0
129	2	5	0	0	0	0	0	708,400	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	423,100	0	0	0	0	0
Totals	22,870	64,265	9,496	14,352	4,174	11,863	30,389	3,781,105	8,693	14,721	2,955,394	1,007,110	455,865

Appendix B – Hawaii Socioeconomic Data

Hawaii Island - Socio-Economic Data Year 2007													
TAZ				EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
1	0	0	131	652	20	343	1,015	16,382	0	22,349	3,216,642	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	883	2,495	0	97	1	15	113	0	0	0	0	0	0
4	28	79	0	10	9	92	111	0	0	0	0	0	0
5	1,121	3,167	0	102	0	49	151	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	101	285	0	37	0	0	37	0	0	0	0	0	0
8	229	647	0	37	0	10	47	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	119,237	0	0	0	0	0
11	4	13	0	1,050	581	210	1,841	0	0	0	0	0	0
12	0	0	0	224	5	3	232	0	0	0	0	0	0
13	23	74	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	8	8	22	38	0	0	0	0	0	0
15	0	0	0	45	17	64	126	0	0	0	0	0	0
16	908	2,912	3,531	1,095	314	560	1,969	0	0	0	0	0	0
17	120	331	0	44	0	247	291	0	0	0	0	0	0
18	0	0	0	0	0	14	14	0	0	0	0	0	0
19	0	0	0	129	457	80	666	0	0	0	0	0	0
20	185	511	0	281	733	140	1,154	0	0	0	0	0	0
21	128	410	0	542	144	214	900	232,112	1,155	0	0	0	0
22	2	6	0	127	196	399	722	0	0	0	0	0	0
23	91	292	0	362	194	426	982	0	35	0	0	0	0
24	695	1,919	0	221	103	497	821	0	0	0	0	0	0
25	821	2,267	0	1,005	91	616	1,712	0	1,031	0	0	0	0
26	276	762	0	294	28	799	1,121	9,197	299	0	0	0	0
27	48	133	0	13	0	1	14	0	0	0	0	0	0
28	116	309	0	2	0	4	6	0	0	0	0	0	0
29	1,083	2,819	0	342	2	57	401	0	25	0	0	0	0
30	295	768	552	82	0	7	89	0	0	0	0	0	0
31	242	630	0	23	8	23	54	22,300	0	0	0	0	0
32	495	1,289	0	56	0	33	89	0	0	0	0	0	0
33	397	1,033	0	63	72	112	247	0	0	0	0	0	0
34	102	272	0	243	8	13	264	0	29	0	0	0	0
35	272	702	0	94	0	20	114	0	0	0	0	0	0
36	105	271	0	0	0	0	0	0	0	0	0	0	0
37	72	186	0	22	0	33	55	0	0	0	0	0	0
38	787	2,032	0	728	19	421	1,168	0	2,230	0	0	0	0
39	91	235	0	208	163	163	534	0	0	0	0	0	0
40	208	537	0	17	0	113	130	0	0	0	0	0	0
41	38	98	0	145	43	49	237	0	0	0	0	0	0
42	39	102	0	0	0	27	27	0	0	0	0	0	0
43	6	16	0	0	0	0	0	0	0	0	0	0	0
44	422	1,107	577	89	20	237	346	5,780	0	0	0	0	0
45	320	840	1,342	266	8	204	478	0	0	0	0	0	0
46	11	29	0	0	0	0	0	0	0	0	0	0	0
47	148	389	0	0	32	0	32	0	0	0	0	0	0
48	117	308	137	15	1	3	19	0	0	0	0	0	0
49	143	375	0	146	82	607	835	0	8	0	0	0	0
50	114	304	0	32	1	2	35	0	0	0	0	0	0

Hawaii Island - Socio-Economic Data Year 2007														
TAZ	HH	POP	SCHL ENR	EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP							
51	568	1,385	0	16	0	54	70	211,200	60	0	0	0	0	
52	589	1,437	507	283	39	737	1,059	14,554	84	0	0	0	0	
53	808	1,962	0	177	47	1,191	1,415	0	0	0	0	0	0	
54	496	1,286	3,027	1,470	2	372	1,844	0	0	0	0	0	0	
55	556	1,000	0	67	25	59	151	0	6	0	0	0	0	
56	381	686	764	207	36	101	344	0	0	0	0	0	0	
57	334	866	0	45	33	31	109	0	0	0	0	0	0	
58	86	223	0	291	12	524	827	0	0	0	0	0	0	
59	211	512	402	247	147	286	680	0	21	0	0	0	0	
60	352	904	0	14	0	6	20	0	0	0	0	0	0	
61	223	723	1,974	406	3	365	774	0	0	0	0	0	0	
62	379	1,169	0	12	0	18	30	0	0	0	0	0	0	
63	68	175	0	10	0	6	16	0	0	0	0	0	0	
64	391	1,004	0	10	0	443	453	0	0	0	0	0	0	
65	1,070	4,545	0	67	14	13	94	0	0	0	0	0	0	
66	1,405	2,528	0	65	7	49	121	0	0	0	0	0	0	
67	1,037	2,917	0	124	7	37	168	172,315	0	0	0	0	0	
68	154	452	0	137	6	41	184	142,340	0	0	0	0	0	
69	164	482	0	277	727	178	1,182	0	0	0	0	0	0	
70	66	171	0	796	788	470	2,054	0	0	0	0	0	0	
71	339	879	0	362	57	366	785	0	0	0	0	0	0	
72	816	2,115	0	771	89	287	1,147	0	0	0	0	0	0	
73	249	605	0	73	137	2,913	3,123	155,400	0	0	0	0	0	
74	315	809	0	7	0	21	28	0	0	0	0	0	0	
75	0	0	0	0	0	0	0	0	0	0	0	0	0	
76	2	6	0	682	115	279	1,076	0	0	0	0	0	0	
77	6	18	0	586	31	405	1,022	0	0	24,110	1,667,136	0	0	
78	0	0	0	143	139	188	470	0	0	0	0	0	0	
79	164	482	0	341	37	37	415	0	868	0	0	0	0	
80	145	426	0	632	122	305	1,059	0	179	0	0	1,734,735	499,327	
81	297	872	0	37	0	5	42	0	0	0	0	0	0	
82	14	40	0	0	0	0	0	0	0	0	0	0	0	
83	77	218	0	6	0	2	8	0	0	0	0	0	0	
84	111	314	0	113	56	56	225	104,907	0	0	0	1,028,207	0	
85	274	658	0	49	12	37	98	0	0	0	0	0	0	
86	44	146	0	162	0	0	162	0	0	0	0	0	0	
87	0	0	0	0	0	0	0	0	0	0	0	0	0	
88	178	428	0	1,643	29	110	1,782	514,300	1,765	0	0	0	0	
89	70	168	0	0	0	0	0	0	0	0	0	0	0	
90	188	452	0	616	201	285	1,102	0	0	0	0	0	0	
91	667	2,215	0	38	13	76	127	17,201	0	0	0	0	0	
92	427	1,026	0	1,066	169	23	1,258	0	991	0	0	0	0	
93	0	0	0	0	0	0	0	0	0	0	0	0	0	
94	0	0	0	1,746	287	303	2,336	0	0	0	0	0	0	
95	791	1,900	611	177	0	147	324	0	0	0	0	0	0	
96	3	7	0	200	28	410	638	0	0	0	0	0	0	
97	48	159	0	87	67	92	246	21,550	0	1	2,290	0	0	
98	719	1,727	0	421	39	150	610	0	1,342	0	0	0	0	
99	0	0	0	0	0	0	0	0	0	0	0	0	0	
100	19	54	0	147	0	1	148	76,300	50	0	0	0	0	

Hawaii Island - Socio-Economic Data Year 2007													
TAZ	HH	POP	SCHL ENR	EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
101	305	862	0	667	0	494	1,161	0	310	0	0	0	0
102	10	28	0	284	0	122	406	0	0	0	0	0	0
103	5	14	0	0	0	0	0	471,400	0	0	0	0	0
104	113	319	0	279	0	1	280	0	0	0	0	0	0
105	201	536	0	258	55	180	493	0	0	0	0	0	0
106	4	12	0	142	19	78	239	64,600	0	0	0	0	0
107	3	8	0	0	0	51	51	0	0	0	0	0	0
108	353	984	0	21	0	16	37	0	0	0	0	0	0
109	86	247	241	27	0	1	28	0	0	0	0	0	0
110	114	316	0	4	0	9	13	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0
112	2	6	0	0	0	0	0	0	0	0	0	0	0
113	2	6	0	0	0	0	0	0	0	0	0	0	0
114	308	968	0	95	40	14	149	0	0	0	0	0	0
115	2	5	0	0	0	1	1	0	0	0	0	0	0
116	350	953	1,127	203	13	19	235	0	111	0	0	0	0
117	576	1,568	314	37	23	14	74	44,400	0	0	0	0	0
118	3,426	10,296	0	706	205	171	1,082	0	0	0	0	0	0
119	1,925	5,975	0	345	109	7	461	0	0	0	0	0	0
120	44	242	0	298	142	67	507	0	0	0	0	0	0
121	10	26	146	4	0	0	4	0	19	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0	0
123	72	190	0	0	0	0	0	0	4	0	0	0	0
124	15	39	0	39	28	14	81	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0
126	207	545	0	0	0	0	0	0	0	0	0	0	0
127	8	21	0	27	42	5	74	0	0	0	0	0	0
128	594	1,584	0	226	8	20	254	0	0	0	0	0	0
129	230	764	1,094	132	8	464	604	0	0	0	0	0	0
130	349	1,159	0	214	0	35	249	0	0	0	0	0	0
131	497	1,194	0	26	0	63	89	0	0	0	0	0	0
132	1,511	3,114	182	27	0	2	29	0	0	0	0	0	0
133	39	95	334	322	283	970	1,575	18,300	19	0	0	0	0
134	134	370	0	0	0	17	17	0	0	0	0	0	0
135	213	554	0	0	9	0	9	0	0	0	0	0	0
136	94	243	0	16	0	9	25	0	0	0	0	0	0
137	48	124	0	0	0	5	5	0	0	0	0	0	0
138	54	139	0	0	0	1	1	0	0	0	0	0	0
139	97	250	0	0	0	0	0	0	0	0	0	0	0
140	104	273	0	0	0	488	488	0	0	0	0	0	0
141	101	265	0	3	0	1	4	0	117	0	0	0	0
142	171	449	0	5	0	0	5	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	0	0	0	0
144	128	336	0	29	0	7	36	13,794	0	0	0	0	0
145	92	242	0	1	0	9	10	0	0	0	0	0	0
146	93	245	0	7	0	2	9	0	0	0	0	0	0
147	7	18	0	44	5	36	85	0	0	0	0	0	0
148	21	55	0	23	0	0	23	115,900	0	0	0	0	0
149	206	542	0	2	0	7	9	0	0	0	0	0	0
150	241	634	0	89	0	1	90	0	0	0	0	0	0

Hawaii Island - Socio-Economic Data Year 2007													
TAZ				EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
151	44	116	0	0	0	0	0	0	0	0	0	0	0
152	140	368	0	28	9	91	128	0	0	0	0	0	0
153	12	32	0	10	0	0	10	0	0	0	0	0	0
154	29	77	0	0	0	0	0	0	0	0	0	0	0
155	76	203	0	40	0	8	48	0	0	0	0	0	0
156	18	48	0	0	0	0	0	0	0	0	0	0	0
157	153	408	471	24	6	0	30	0	0	0	0	0	0
158	95	253	0	1	0	2	3	0	0	0	0	0	0
159	9	24	0	0	0	0	0	0	0	0	0	0	0
160	98	261	0	11	0	0	11	0	0	0	0	0	0
161	443	1,138	0	1,156	618	111	1,885	0	0	0	0	0	0
162	213	520	0	3	0	0	3	53,300	0	0	0	0	0
163	99	241	0	17	1	1,176	1,194	0	0	0	0	0	0
164	172	531	0	11	0	4	15	0	0	0	0	0	0
165	535	1,505	0	19	2	2	23	0	0	0	0	0	0
166	383	1,125	0	218	302	117	637	0	0	0	0	0	0
167	1,327	4,093	596	83	0	302	385	0	0	0	0	0	0
168	69	203	0	29	6	37	72	0	0	0	0	0	0
169	332	975	543	70	0	22	92	0	0	0	0	0	0
170	64	181	0	0	0	0	0	0	0	0	0	0	0
171	42	119	0	247	78	43	368	0	0	0	0	0	0
172	5	14	0	0	0	0	0	30,600	0	0	0	0	0
173	64	181	0	0	0	0	0	9,800	0	0	0	0	0
174	205	579	0	0	0	0	0	0	0	0	0	0	0
175	134	379	880	62	0	2	64	0	0	0	0	0	0
176	219	619	0	42	0	64	106	0	3	0	0	0	0
177	55	155	0	0	0	0	0	0	0	0	0	0	0
178	180	509	0	0	0	0	0	0	0	0	0	0	0
179	443	1,252	0	16	0	13	29	0	18	0	0	0	0
180	2	6	0	0	0	0	0	0	0	0	0	0	0
181	53	150	0	0	0	0	0	0	2	0	0	0	0
182	175	494	0	91	23	52	166	0	0	0	0	0	0
183	5	14	0	0	0	0	0	0	0	0	0	0	0
184	244	689	0	20	0	17	37	0	0	0	0	0	0
185	944	3,135	0	49	0	57	106	0	0	0	0	0	0
186	50	166	0	44	108	166	318	0	0	0	0	0	0
187	117	337	0	0	0	0	0	0	0	0	0	0	0
188	0	0	0	0	0	0	0	0	0	0	0	0	0
189	13	36	0	0	0	0	0	0	0	0	0	0	0
190	237	661	0	54	3	70	127	0	64	0	0	0	0
191	231	644	0	0	0	0	0	0	0	0	0	0	0
192	482	1,344	1,218	257	74	226	557	0	0	0	0	0	0
193	15	43	0	0	0	0	0	0	0	0	0	0	0
194	48	138	0	0	0	0	0	0	0	0	0	0	0
195	126	363	0	4	0	3	7	0	0	0	0	0	0
196	16	46	0	0	0	0	0	0	0	0	0	0	0
197	255	734	0	8	0	6	14	5,500	0	0	0	0	0
198	174	501	0	2	0	0	2	0	0	0	0	0	0
199	376	1,043	200	72	2	11	85	0	0	0	0	0	0
200	49	136	0	2	0	0	2	0	0	0	0	0	0

Hawaii Island - Socio-Economic Data Year 2007													
TAZ	HH	POP	SCHL ENR	EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
201	146	405	0	4	0	0	4	0	0	0	0	0	0
202	131	341	0	26	0	1	27	0	0	0	0	0	0
203	28	73	0	0	0	0	0	0	0	0	0	0	0
204	396	1,031	334	87	13	56	156	0	0	0	0	0	0
205	18	47	0	0	0	0	0	0	0	0	0	0	0
206	251	653	0	12	1	1	14	189,400	0	0	0	0	0
207	317	825	0	0	0	0	0	0	0	0	0	0	0
208	8	21	0	0	0	0	0	0	0	0	0	0	0
209	264	687	0	7	0	17	24	0	0	0	0	0	0
210	36	94	0	0	0	0	0	79,372	0	0	0	0	0
211	100	260	0	3	0	5	8	0	0	0	0	0	0
212	155	404	0	7	2	0	9	0	0	0	0	0	0
213	168	437	0	0	0	6	6	0	0	0	0	0	0
214	467	1,513	154	40	3	25	68	0	0	0	0	0	0
215	40	130	0	0	0	0	0	157,900	0	0	0	0	0
216	7	23	0	92	0	0	92	0	0	0	0	0	0
217	417	1,311	0	60	0	3	63	0	0	0	0	0	0
218	883	1,820	470	121	20	56	197	0	0	0	0	0	0
219	467	1,468	0	8	0	5	13	0	0	0	0	0	0
220	300	618	0	0	0	0	0	0	0	0	0	0	0
221	883	1,820	0	0	0	0	0	100,000	0	0	0	0	0
222	367	862	0	0	0	0	0	0	0	0	0	0	0
223	703	1,651	0	345	99	155	599	11,900	0	0	0	0	0
224	111	302	0	0	0	0	0	0	0	0	0	0	0
225	28	76	0	0	0	0	0	0	42	0	0	0	0
226	0	0	0	0	0	0	0	0	0	0	0	0	0
227	25	68	0	0	0	0	0	0	0	0	0	0	0
228	1,493	4,066	654	92	0	26	118	0	0	0	0	0	0
229	336	789	60	9	0	3	12	0	0	0	0	0	0
230	6	33	0	0	0	0	0	0	0	0	0	0	0
231	369	2,029	2,424	577	94	136	807	0	140	0	0	0	0
232	200	526	0	0	0	51	51	0	0	0	0	0	0
233	11	29	0	0	0	0	0	0	0	0	0	0	0
234	210	553	0	4	0	0	4	0	0	0	0	0	0
235	67	176	0	0	0	0	0	0	0	0	0	0	0
236	1	3	0	91	32	153	276	1,467,779	0	0	0	0	0
237	0	0	0	0	0	0	0	0	0	0	0	0	0
238	0	0	0	0	0	0	0	0	0	0	0	0	0
239	1	3	0	0	0	0	0	0	0	0	0	0	0
240	4	11	0	0	0	0	0	0	0	0	0	0	0
241	469	1,234	516	235	15	81	331	0	0	0	0	0	0
242	88	232	414	66	0	7	73	0	0	0	0	0	0
243	30	79	0	0	0	0	0	0	0	0	0	0	0
244	29	76	0	26	0	16	42	0	6	0	0	0	0
245	24	63	0	0	0	0	0	0	0	0	0	0	0
246	365	961	0	0	0	0	0	0	0	0	0	0	0
247	120	316	0	29	0	16	45	0	0	0	0	0	0
248	1,079	2,840	0	16	0	0	16	25,900	0	0	0	0	0
249	23	61	0	0	0	0	0	0	0	0	0	0	0
250	116	305	0	1	0	0	1	0	0	0	0	0	0

Hawaii Island - Socio-Economic Data Year 2007													
TAZ				EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
251	33	87	0	0	0	0	0	0	0	0	0	0	0
252	36	95	0	0	9	4	13	0	0	0	0	0	0
253	26	68	0	0	0	0	0	0	0	0	0	0	0
254	211	555	0	36	13	63	112	0	0	0	0	0	0
255	1	3	0	93	0	0	93	0	0	0	0	0	0
256	115	303	0	0	0	1	1	0	0	0	0	0	0
257	262	689	0	0	0	0	0	0	0	0	0	0	0
258	91	239	0	0	0	41	41	0	0	0	0	0	0
259	9	24	0	0	0	0	0	0	0	0	0	0	0
260	37	97	142	16	0	1	17	489,785	0	0	0	0	0
261	34	89	0	0	0	0	0	0	0	0	0	0	0
262	81	216	0	32	0	0	32	0	0	0	0	0	0
263	42	139	0	33	0	10	43	0	0	0	0	0	0
264	143	475	152	81	0	6	87	0	0	0	0	0	0
265	169	561	0	126	0	69	195	0	28	0	0	0	0
266	0	0	0	0	0	0	0	0	0	0	0	0	0
267	426	2,343	0	3	0	0	3	0	0	0	0	0	0
268	341	941	152	48	0	13	61	0	0	0	0	0	0
269	29	80	0	11	0	0	11	0	0	0	0	0	0
Totals	62,865	173,038	26,373	33,503	9,403	25,438	68,344	5,184,705	11,061	46,460	4,886,068	2,762,942	499,327

Appendix C – Maui Socioeconomic Data

Maui Island - Socio-Economic Data Year 2007													
TAZ	HH	POP	SCHL ENR	EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
1	349	1,006	327	335	14	109	458	261,841	164	10	5,271	0	0
2	0	0	0	25	4	31	60	0	0	0	0	0	0
3	85	245	0	0	0	0	0	0	0	0	0	0	0
4	45	98	0	499	8	12	519	0	8	0	0	0	0
5	388	1,187	0	247	0	259	506	525,400	33	0	0	0	0
6	273	835	0	3,960	523	99	4,582	0	44	0	0	0	0
7	169	517	0	70	2	37	109	0	0	0	0	0	0
8	126	421	0	28	0	47	75	0	0	0	0	0	0
9	93	285	0	0	0	6	6	0	0	0	0	0	0
10	178	545	0	47	1	16	64	0	0	0	0	0	0
11	492	1,066	0	231	0	46	277	0	0	0	0	0	0
12	423	887	0	232	14	25	271	0	0	0	0	0	0
13	89	187	0	219	78	111	408	0	0	0	0	0	0
14	0	0	1,450	147	0	49	196	0	0	0	0	0	0
15	187	434	0	121	43	71	235	0	42	0	0	0	0
16	798	1,674	0	191	7	106	304	0	0	0	0	0	0
17	0	0	0	0	0	98	98	0	0	0	0	0	0
18	999	2,321	0	537	108	156	801	0	5,934	0	0	0	0
19	196	455	650	128	4	98	230	0	0	0	0	0	0
20	133	309	0	49	1	31	81	0	0	0	0	0	0
21	100	334	0	170	0	14	184	0	113	0	0	0	0
22	827	2,765	0	54	0	57	111	0	0	0	0	0	0
23	2	2	0	0	0	0	0	0	0	0	0	0	0
24	263	743	0	6	0	28	34	0	0	0	0	0	0
25	1	4	0	0	0	0	0	0	0	0	0	0	0
26	9	11	0	8	0	157	165	0	0	0	0	0	0
27	427	519	0	77	46	374	497	471,570	0	0	0	0	0
28	6	13	0	0	0	0	0	1,322,817	0	0	0	0	0
29	240	520	0	6	0	0	6	0	0	0	0	0	0
30	6	13	0	2	24	0	26	3,800	0	0	0	0	0
31	368	798	0	63	2	21	86	0	0	0	0	0	0
32	1,166	2,527	0	223	64	68	355	0	0	0	0	0	0
33	5	14	0	0	0	13	13	0	0	0	0	0	0
34	874	1,447	1,387	465	108	596	1,169	0	0	0	0	0	0
35	685	1,134	0	46	19	192	257	0	0	0	0	0	0
36	1,180	3,087	0	335	7	85	427	0	0	0	0	0	0
37	321	2,288	0	2	9	0	11	0	0	0	0	0	0
38	893	2,540	208	457	127	70	654	0	0	0	0	0	0
39	306	507	0	0	0	108	108	0	2	0	0	0	0
40	32	39	0	9	0	0	9	0	7	0	0	0	0
41	99	120	0	8	0	0	8	0	0	0	0	0	0
42	203	247	0	13	0	7	20	0	0	0	0	0	0
43	79	196	0	0	0	13	13	0	0	0	0	0	0
44	175	433	701	531	183	223	937	0	49	0	0	0	0
45	502	1,243	0	287	50	221	558	72,262	0	0	0	0	0
46	101	250	0	1,205	545	479	2,229	264,692	49	0	0	0	0
47	70	173	0	4	0	4	8	0	0	0	0	0	0
48	218	540	0	109	342	110	561	0	0	0	0	0	0
49	519	2,716	0	211	170	724	1,105	0	0	0	0	0	0
50	3	16	0	0	0	0	0	0	0	0	0	0	0

Maui Island - Socio-Economic Data Year 2007														
TAZ	HH	POP	SCHL ENR	EMPLOYMENT					VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP							
51	135	489	0	94	30	349	473	0	0	0	0	0	0	
52	647	2,344	0	59	0	32	91	0	0	0	0	0	0	
53	1	4	0	0	0	0	0	1,364	0	0	0	0	0	
54	204	416	0	4,057	431	298	4,786	221,562	4,884	0	0	0	0	
55	156	318	0	38	0	75	113	0	0	0	0	0	0	
56	0	0	0	203	89	65	357	0	0	0	0	0	0	
57	469	976	0	65	47	47	159	0	0	0	0	0	0	
58	0	0	0	0	0	0	0	0	0	0	0	0	0	
59	362	737	0	88	77	30	195	0	0	0	0	0	0	
60	238	495	0	39	6	52	97	0	0	870	107,777	0	0	
61	559	1,164	0	100	16	41	157	0	0	0	0	0	0	
62	315	656	0	267	8	177	452	0	80	0	0	0	0	
63	420	2,237	0	1,554	41	625	2,220	0	1,993	0	0	0	0	
64	30	62	0	126	0	24	150	0	30	0	0	0	0	
65	15	31	0	177	5	0	182	0	0	0	0	0	0	
66	217	539	0	2	0	12	14	0	0	0	0	0	0	
67	658	1,635	0	19	15	3	37	0	0	0	0	0	0	
68	124	308	819	86	0	5	91	0	0	0	0	0	0	
69	157	584	0	4	0	0	4	0	0	0	0	0	0	
70	1,488	5,537	0	27	13	193	233	24,000	9	0	0	0	0	
71	272	672	0	1	47	9	57	0	0	0	0	0	0	
72	142	561	0	8	0	0	8	0	19	0	0	0	0	
73	116	288	0	2	5	41	48	862,800	0	0	0	0	0	
74	457	1,804	0	26	0	10	36	0	0	0	0	0	0	
75	801	1,990	894	418	0	932	1,350	12,962	0	0	0	0	0	
76	652	1,620	0	282	0	238	520	0	0	0	0	0	0	
77	58	144	0	19	11	72	102	0	0	0	0	0	0	
78	0	0	0	0	0	0	0	0	0	0	0	0	0	
79	0	0	0	0	0	0	0	0	0	0	0	0	0	
80	0	0	0	155	1,053	413	1,621	0	0	0	0	0	0	
81	4	14	0	0	0	49	49	38,453	0	0	0	0	0	
82	0	0	0	598	6	170	774	0	0	0	0	0	0	
83	0	0	0	0	0	0	0	0	0	0	0	0	0	
84	0	0	0	1	147	0	148	0	0	0	0	0	0	
85	171	597	0	8	341	73	422	0	0	0	0	0	0	
86	1	3	0	0	0	0	0	0	0	0	0	0	0	
87	0	0	0	142	86	23	251	0	0	0	0	0	0	
88	77	261	0	0	0	43	43	0	0	0	0	0	0	
89	247	837	327	81	0	38	119	0	0	0	0	0	0	
90	300	1,394	0	0	0	1	1	0	0	0	0	0	0	
91	1	3	0	0	0	0	0	0	0	0	0	0	0	
92	17	48	0	0	0	0	0	0	0	0	0	0	0	
93	240	675	0	2	0	2	4	0	0	0	0	0	0	
94	377	1,060	479	140	2	94	236	0	0	0	0	0	0	
95	581	1,634	0	31	6	9	46	0	0	0	0	0	0	
96	146	411	0	12	0	47	59	0	0	0	0	0	0	
97	341	959	0	70	73	715	858	0	0	0	0	0	0	
98	188	529	0	2	0	5	7	0	0	0	0	0	0	
99	603	1,696	0	12	6	69	87	0	0	0	0	0	0	
100	210	591	0	277	0	11	288	0	0	0	0	0	0	

Maui Island - Socio-Economic Data Year 2007													
TAZ	HH	POP	SCHL ENR	EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
101	48	135	0	0	0	0	4	4	0	0	0	0	0
102	148	416	1,354	153	0	18	171	171	0	0	0	0	0
103	186	405	0	19	0	3	22	22	0	0	0	0	0
104	4	29	0	13	0	0	13	13	0	0	0	0	0
105	0	0	0	418	23	401	842	842	0	0	0	0	0
106	34	119	0	66	0	345	411	411	0	0	32,368	6,517,710	0
107	0	0	0	1,747	1,013	1,135	3,895	3,895	0	0	0	0	0
108	320	1,117	0	3,743	681	1,294	5,718	5,718	0	0	0	0	0
109	0	0	0	547	243	243	1,033	1,033	0	427	0	3,143,083	496,813
110	0	0	0	261	543	217	1,021	1,021	0	31	0	0	0
111	58	202	0	243	12	582	837	837	0	0	0	0	0
112	38	133	0	465	633	717	1,815	1,815	0	0	0	0	0
113	180	628	0	67	26	25	118	118	0	0	0	0	0
114	712	2,323	1,006	126	0	14	140	140	0	0	0	0	0
115	859	2,802	0	7	0	392	399	399	0	0	0	0	0
116	289	1,009	0	0	0	7	7	7	0	0	0	0	0
117	427	1,490	0	1	0	23	24	24	0	0	0	0	0
118	163	757	2,589	266	0	32	298	298	0	0	0	0	0
119	254	1,180	0	11	0	0	11	11	0	0	0	0	0
120	368	1,248	0	1	0	2,425	2,426	2,426	0	0	0	0	0
121	509	1,726	0	9	0	13	22	22	0	0	0	0	0
122	687	2,329	1,015	106	0	15	121	121	0	0	0	0	0
123	824	3,828	0	5	1	43	49	49	0	0	0	0	0
124	387	1,312	0	10	47	122	179	179	0	12	0	0	0
125	255	1,007	0	44	7	11	62	62	0	0	0	0	0
126	46	182	0	0	0	783	783	783	0	0	0	0	0
127	728	1,799	0	646	75	1,507	2,228	2,228	0	0	0	0	0
128	413	1,630	818	362	55	1,017	1,434	1,434	0	0	0	0	0
129	184	517	0	45	74	75	194	194	0	0	0	0	0
130	893	2,510	0	1,139	183	850	2,172	2,172	0	0	0	0	0
131	703	2,775	1,602	403	58	209	670	670	0	0	0	0	0
132	33	93	0	11	0	2	13	13	0	0	0	0	0
133	39	110	0	0	0	0	0	0	0	0	0	0	0
134	483	1,365	0	5	2	7	14	14	0	0	0	0	0
135	650	1,685	0	74	0	84	158	158	0	352	0	0	0
136	535	1,387	0	3	0	5	8	8	0	352	0	0	0
137	282	731	0	108	0	30	138	138	0	0	0	0	0
138	545	1,413	0	26	0	23	49	49	0	0	0	0	0
139	18	47	0	1	0	7	8	8	0	0	0	0	0
140	308	798	0	2	1	27	30	30	0	0	0	0	0
141	144	373	0	3	0	0	3	3	0	0	0	0	0
142	202	524	0	188	111	104	403	403	0	0	0	0	0
143	129	334	0	408	375	269	1,052	1,052	0	1,274	0	0	0
144	105	272	0	0	0	0	0	0	0	0	0	0	0
145	995	3,577	277	1,157	100	560	1,817	1,817	0	0	0	0	0
146	70	202	0	13	0	0	13	13	259,500	0	0	0	0
147	93	268	0	8	0	7	15	15	0	0	0	0	0
148	154	444	0	0	0	0	0	0	0	0	0	0	0
149	371	804	0	46	0	267	313	313	0	0	0	0	0
150	36	78	0	0	0	0	0	0	0	0	0	0	0

Maui Island - Socio-Economic Data Year 2007													
TAZ	HH	POP	SCHL ENR	EMPLOYMENT				VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
				OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP						
151	132	286	455	56	0	40	96	0	0	0	0	0	0
152	630	1,365	0	286	6	49	341	29,275	0	0	0	0	0
153	469	2,454	2,235	228	0	17	245	0	77	0	0	0	0
154	375	764	0	1,060	13	110	1,183	0	3,153	0	0	0	0
155	659	1,372	0	92	42	76	210	0	78	0	0	0	0
156	118	257	0	1	0	9	10	0	0	0	0	0	0
157	952	2,071	0	162	21	35	218	0	0	0	0	0	0
158	2,059	4,479	441	238	65	154	457	0	0	0	0	0	0
Totals	47,203	135,195	19,034	35,748	9,474	24,467	69,689	4,372,298	19,216	33,248	6,630,758	3,143,083	496,813

Attachment 2
2020 and 2035 Forecast
Land Use and Socioeconomic Data Methodology

Statewide Long-Range Land Transportation Plan and the Regional Long-Range Land Transportation Plans for Maui, Hawaii and Kauai Counties

2020 and 2035 Forecast Land Use and Socioeconomic Data Methodology

PREPARED FOR: Hawaii Long-Range Land Transportation Plan Technical Advisory Committee

PREPARED BY: Kevin Murphy/CH2M HILL

DATE: Revised August 30, 2012

Introduction

This memorandum discusses the methodology used to develop the 2020 and 2035 land use and socioeconomic data for the three islands: Maui, Hawaii and Kauai. The forecasts for households, employment, schools, visitor accommodations, visitor attractions, airports, and harbors have been processed to prepare input for the travel demand modeling and traffic forecasting.

Forecast Data and Methods

The land use and socioeconomic forecast data comes from the Hawaii State Department of Business, Economic Development, and Tourism (DBEDT). The DBEDT forecast used is the Long Range Project (November 2008). This data includes forecasts of population, employment and visitor's for each County in the State of Hawaii. Table 1 shows the variables used to forecast each data item needed for the travel demand model.

Maui and Kauai County staff provided information on where they expected future growth to occur. This information was used to assist in the distribution of the DBEDT forecasts for the Island to the traffic analysis zones (TAZ). Maui staff provided growth information for housing units, visitor accommodations, and square footage by retail, office and industrial uses by TAZ. This information was used to distribute forecast variables (households, retail, service and other employment, and visitor accommodations).

Kauai County staff provided information on the growth of housing units, resort units and commercial square footage by TAZ. This information was used to distribute forecast variables (households, employment and visitor units).

Household forecast distribution for Hawaii used an intermediate step from the DBEDT island total to district using the population forecasts from the Hawaii County General Plan. Households were distributed to the districted based upon the population forecast distribution described in the plan. The TAZ distribution of households was done as a proportionate share of each TAZs percentage of the district's total in the base year applied to the forecasted district total. Employment growth was distributed based upon the base year distribution.

TABLE 1
Land Use and Socioeconomic Data Variables and Methods

Forecast Data	DBEDT Variable used	Method
Household	Population	Calculated persons per household for 2020 and 2035 based upon the change in household size from 2000 to 2010 from the Census. Applied the revised person/household to the population forecast to estimate households. Households were distributed based upon information provided by the County or base year data.
School Enrollment	Population ages 5 to 19	Annual growth rates were developed for population ages 5 to 19 for each forecast period (2007 to 2020 and 2020 to 2035). The growth rates were applied to the 2007 base to estimate 2020 and then to 2020 to estimate 2035 school enrollment.
Employment	Employment by category	Growth increment was calculated for employment from 2007 to 2020 and from 2020 to 2035. Employment was distributed based upon data provided by the County or the base year.
Visitor Attraction	Visitor projection from average growth scenario	Annual growth rate was calculated for each forecast period (2007 to 2020 and 2020 to 2035) and applied to the base data.
Visitor Accommodation	Hotel rooms (Visitor accommodations) projection from average growth scenario	Growth increment was calculated for each forecast period (2007 to 2020 and 2020 to 2035) and distributed based upon data provided by the County or the base year.
Airport Tonnage	Population	Annual growth rate was calculated for each forecast period (2007 to 2020 and 2020 to 2035) and applied to the base data.
Airport Passenger	Visitor projection from average growth scenario	Annual growth rate was calculated for each forecast period (2007 to 2020 and 2020 to 2035) and applied to the base data.
Harbor Tonnage	Population	Annual growth rate was calculated for each forecast period (2007 to 2020 and 2020 to 2035) and applied to the base data.
Harbor Passenger	Visitor projection from average growth scenario	Annual growth rate was calculated for each forecast period (2007 to 2020 and 2020 to 2035) and applied to the base data.

Summary of Forecasts

The following tables summarize the 2020 and 2035 forecasts for the three Islands. Hawaii is forecasted to experience the largest growth in households with 43,436 between 2007 and 2035. Hawaii is also expected to have the highest employment growth with 34,362 between 2007 and 2035 with Maui having a similar amount of growth with 32,347. Kauai is forecasted to grow at a slower rate than both Hawaii and Maui between 2007 and 2035.

TABLE 2
2007 Base Year Data by Island

Island	2007 Base Year				
	Households	Retail	Service	Other	Total
Hawaii	62,865	9,403	25,438	33,503	68,344
Kauai	22,870	4,174	11,863	14,352	30,389
Maui	47,203	9,474	24,467	35,748	69,689

TABLE 3
2020 and 2035 Population and Household Forecasts by Island

Island	2020		2035		2020	2035
	Population	Households	Population	Households	Person/HH	Person/HH
Hawaii	225,264	83,164	280,020	106,301	2.71	2.63
Kauai	73,536	25,589	85,177	29,780	2.87	2.86
Maui	163,093	58,674	197,356	74,105	2.78	2.66

TABLE 4
2020 and 2035 Employment by Category by Island

Island	2020				2035			
	Retail	Service	Other	Total	Retail	Service	Other	Total
Hawaii	11,353	42,248	31,723	85,324	13,425	52,799	36,482	102,706
Kauai	4,730	17,258	14,488	36,476	5,302	20,519	16,341	42,162
Maui	11,442	38,137	37,698	87,277	13,075	45,997	42,964	102,036

Attachment 3
Summary of Socioeconomic Data

A summary of the socioeconomic data for 2007, 2020, and 2035 are provided by traffic analysis zone. Below is a glossary of the abbreviations used in the tables.

<i>Glossary</i>	
TAZ	Traffic Analysis Zone
HH	Households
POP	Population
SCHL ENR	School Enrollments
OTHER EMP	Other Employment
RETAIL EMP	Retail Employment
SERVICE EMP	Service Employment
TOT EMP	Total Employment
VIS ATT	Visitor Attractions
VISITOR ACCOM	Visitor Accommodations
AIR TONS	Air Tonnage
AIR PASNGR	Air Passenger
HARBOR TONS	Harbor Tonnage
HARBOR PSNGR	Harbor Passenger

TAZ	Hawaii Island - Socio-Economic Data Year 2007													Hawaii Island - Socio-Economic Data Year 2020 Forecast													Hawaii Island - Socio-Economic Data Year 2035 Forecast																			
	EMPLOYMENT							VISITORS						EMPLOYMENT						VISITORS						EMPLOYMENT						VISITORS														
	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR							
1	0	0	131	652	20	343	1,015	16,382	0	22,349	3,216,642	0	0	0	144	617	24	599	1,240	17,717	0	26,476	3,478,770	0	0	0	0	0	179	710	29	760	1,498	20,321	0	32,910	3,990,025	0	0	0						
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
3	883	2,495	0	97	1	15	113	0	0	0	0	0	0	1,159	3,139	0	92	1	26	119	0	0	0	0	0	0	0	1,474	3,883	0	106	1	33	140	0	0	0	0	0	0						
4	28	79	0	10	9	92	111	0	0	0	0	0	0	37	100	0	9	11	161	181	0	0	0	0	0	0	0	47	124	0	11	13	204	227	0	0	0	0	0	0						
5	1,121	3,167	0	102	0	49	151	0	0	0	0	0	0	1,472	3,987	0	97	0	86	182	0	0	0	0	0	0	0	1,871	4,929	0	111	0	109	220	0	0	0	0	0	0						
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
7	101	285	0	37	0	0	37	0	0	0	0	0	0	133	360	0	35	0	0	35	0	0	0	0	0	0	0	169	445	0	40	0	0	40	0	0	0	0	0	0						
8	229	647	0	37	0	10	47	0	0	0	0	0	0	301	815	0	35	0	17	52	0	0	0	0	0	0	0	382	1,006	0	40	0	22	62	0	0	0	0	0	0						
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
10	0	0	0	0	0	0	0	119,237	0	0	0	0	0	0	0	0	0	0	0	0	128,954	0	0	0	0	0	0	0	0	0	0	0	0	0	147,905	0	0	0	0	0	0					
11	4	13	0	1,050	581	210	1,841	0	0	0	0	0	0	5	14	0	994	701	367	2,062	0	0	0	0	0	0	7	18	0	1,144	830	465	2,438	0	0	0	0	0	0	0						
12	0	0	0	224	5	3	232	0	0	0	0	0	0	0	0	0	212	6	5	223	0	0	0	0	0	0	0	244	7	7	258	0	0	0	0	0	0	0	0	0						
13	23	74	0	0	0	0	0	0	0	0	0	0	0	30	81	0	0	0	0	0	0	0	0	0	0	0	38	100	0	0	0	0	0	0	0	0	0	0	0	0	0					
14	0	0	0	8	8	22	38	0	0	0	0	0	0	0	0	0	8	10	38	56	0	0	0	0	0	0	0	9	11	49	69	0	0	0	0	0	0	0	0	0	0					
15	0	0	0	45	17	64	126	0	0	0	0	0	0	0	0	0	43	21	112	175	0	0	0	0	0	0	0	49	24	142	215	0	0	0	0	0	0	0	0	0	0					
16	908	2,912	3,531	1,095	314	560	1,969	0	0	0	0	0	0	1,192	3,229	3,893	1,037	379	978	2,394	0	0	0	0	0	0	1,516	3,993	4,833	1,193	448	1,240	2,881	0	0	0	0	0	0	0	0	0				
17	120	331	0	44	0	247	291	0	0	0	0	0	0	158	428	0	42	0	431	473	0	0	0	0	0	0	200	527	0	48	0	547	595	0	0	0	0	0	0	0	0	0				
18	0	0	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	0	31	31	0	0	0	0	0	0	0	0	0				
19	0	0	0	129	457	80	666	0	0	0	0	0	0	0	0	0	122	552	140	814	0	0	0	0	0	0	0	0	0	140	652	177	970	0	0	0	0	0	0	0	0	0				
20	185	511	0	281	733	140	1,154	0	0	0	0	0	0	243	658	0	266	885	244	1,396	0	0	0	0	0	0	309	814	0	306	1,047	310	1,663	0	0	0	0	0	0	0	0	0	0			
21	128	410	0	542	144	214	900	232,112	1,155	0	0	0	0	168	455	0	513	174	374	1,061	251,027	1,351	0	0	0	0	214	564	0	590	206	474	1,270	287,919	1,553	0	0	0	0	0	0	0	0			
22	2	6	0	127	196	399	722	0	0	0	0	0	0	3	8	0	120	237	697	1,054	0	0	0	0	0	0	3	8	0	138	280	884	1,302	0	0	0	0	0	0	0	0	0				
23	91	292	0	362	194	426	982	0	35	0	0	0	0	119	322	0	343	234	744	1,321	0	41	0	0	0	0	152	400	0	394	277	943	1,615	0	47	0	0	0	0	0	0	0				
24	695	1,919	0	221	103	497	821	0	0	0	0	0	0	912	2,470	0	209	124	868	1,201	0	0	0	0	0	0	1,160	3,056	0	241	147	1,101	1,488	0	0	0	0	0	0	0	0	0	0			
25	821	2,267	0	1,005	91	616	1,712	0	1,031	0	0	0	0	1,078	2,920	0	952	110	1,076	2,137	0	1,206	0	0	0	0	1,371	3,612	0	1,095	130	1,364	2,589	0	1,387	0	0	0	0	0	0	0	0			
26	276	762	0	294	28	799	1,121	9,197	299	0	0	0	0	362	981	0	278	34	1,395	1,707	9,946	350	0	0	0	0	461	1,214	0	320	40	1,769	2,130	11,408	402	0	0	0	0	0	0	0	0			
27	48	133	0	13	0	1	14	0	0	0	0	0	0	63	171	0	12	0	2	14	0	0	0	0	0	0	80	211	0	14	0	2	16	0	0	0	0	0	0	0	0	0	0			
28	116	309	0	2	0	4	6	0	0	0	0	0	0	152	412	0	2	0	7	9	0	0	0	0	0	0	194	511	0	2	0	9	11	0	0	0	0	0	0	0	0	0	0			
29	1,083	2,819	0	342	2	57	401	0	25	0	0	0	0	1,422	3,852	0	324	2	100	426	0	29	0	0	0	0	1,808	4,763	0	372	3	126	502	0	34	0	0	0	0	0	0	0	0			
30	295	768	552	82	0	7	89	0	0	0	0	0	0	387	1,048	609	78	0	12	90	0	0	0	0	0	0	492	1,296	755	89	0	16	105	0	0	0	0	0	0	0	0	0	0	0		
31	242	630	0	23	8	23	54	22,300	0	0	0	0	0	318	861	0	22	10	40	72	24,117	0	0	0	0	0	404	1,064	0	25	11	51	87	27,662	0	0	0	0	0	0	0	0	0	0		
32	495	1,289	0	56	0	33	89	0	0	0	0	0	0	650	1,761	0	53	0	58	111	0	0	0	0	0	0	826	2,176	0	61	0	73	134	0	0	0	0	0	0	0	0	0	0	0	0	
33	397	1,033	0	63	72	112	247	0	0	0	0	0	0	521	1,411	0	60	87	196	342	0	0	0	0	0	0	663	1,746	0	69	103	248	419	0	0	0	0	0	0	0	0	0	0	0	0	
34	102	272	0	243	8	13	264	0	29	0	0	0	0	134	363	0	230	10	23	262	0	34	0	0	0	0	170	448	0	265	11	29	305	0	39	0	0	0	0	0	0	0	0	0		
35	272	702	0	94	0	20	114	0	0	0	0	0	0	357	967	0	89	0	35	124	0	0	0	0	0	0	454	1,196	0	102	0	44	147	0	0	0	0	0	0	0	0	0	0	0	0	
36	105	271	0	0	0	0	0	0	0	0	0	0	0	138	374	0	0	0	0	0	0	0	0	0	0	0	175	461	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	72	186	0	22	0	33	55	0	0	0	0	0	0	95	257	0	21	0	58	78	0	0	0	0	0	0	120	316	0	24	0	73	97	0	0	0	0	0	0	0	0	0	0	0	0	
38	787	2,032	0	728	19	421	1,168	0	2,230	0	0	0	0	1,033	2,798	0	689	23	735	1,447	0	2,608	0	0	0	0	1,314	3,461	0	793	27	932	1,752	0	2,999	0	0	0	0	0	0	0	0	0	0	
39	91	235	0	208	163	163	534	0	0	0	0	0	0	119	322	0	197	197	285	678	0	0	0	0	0	0	152	400	0	227	233	361	820	0	0	0	0	0	0	0	0	0	0	0	0	0
40	208	537	0	17	0	113	130	0	0	0	0	0	0	273	739	0	16	0	197	213	0	0	0	0	0	0	347	914	0	19	0	250	269	0	0											

TAZ	Hawaii Island - Socio-Economic Data Year 2007													Hawaii Island - Socio-Economic Data Year 2020 Forecast													Hawaii Island - Socio-Economic Data Year 2035 Forecast												
	EMPLOYMENT						VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	EMPLOYMENT						VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	EMPLOYMENT						VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR			
	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP	SERVICE EMP							TOT EMP	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP							SERVICE EMP	TOT EMP	HH	POP	SCHLENR	OTHER EMP							RETAIL EMP	SERVICE EMP	TOT EMP
141	101	265	0	3	0	1	4	0	117	0	0	0	0	147	398	0	3	0	2	5	0	137	0	0	0	0	199	524	0	3	0	2	5	0	157	0	0	0	0
142	171	449	0	5	0	0	5	0	0	0	0	0	0	249	674	0	5	0	0	5	0	0	0	0	0	337	888	0	5	0	0	5	0	0	0	0	0	0	
143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
144	128	336	0	29	0	7	36	13,794	0	0	0	0	0	186	504	0	27	0	12	40	14,918	0	0	0	0	253	666	0	32	0	16	47	17,111	0	0	0	0		
145	92	242	0	1	0	9	10	0	0	0	0	0	0	134	363	0	1	0	16	17	0	0	0	0	182	479	0	1	0	20	21	0	0	0	0	0	0		
146	93	245	0	7	0	2	9	0	0	0	0	0	0	135	366	0	7	0	3	10	0	0	0	0	184	485	0	8	0	4	12	0	0	0	0	0	0		
147	7	18	0	44	5	36	85	0	0	0	0	0	0	10	27	0	42	6	63	111	0	0	0	0	14	37	0	48	7	80	135	0	0	0	0	0	0		
148	21	55	0	23	0	0	23	115,900	0	0	0	0	0	31	84	0	22	0	0	22	125,345	0	0	0	0	41	108	0	25	0	0	25	143,766	0	0	0	0	0	
149	206	542	0	2	0	7	9	0	0	0	0	0	0	300	813	0	2	0	12	14	0	0	0	0	407	1,072	0	2	0	16	18	0	0	0	0	0	0		
150	241	634	0	89	0	1	90	0	0	0	0	0	0	351	951	0	84	0	2	86	0	0	0	0	476	1,254	0	97	0	2	99	0	0	0	0	0	0		
151	44	116	0	0	0	0	0	0	0	0	0	0	0	64	173	0	0	0	0	0	0	0	0	0	87	229	0	0	0	0	0	0	0	0	0	0	0		
152	140	368	0	28	9	91	128	0	0	0	0	0	0	204	553	0	27	11	159	196	0	0	0	0	276	727	0	30	13	202	245	0	0	0	0	0	0		
153	12	32	0	10	0	0	10	0	0	0	0	0	0	16	43	0	9	0	0	9	0	0	0	0	20	53	0	11	0	0	11	0	0	0	0	0	0		
154	29	77	0	0	0	0	0	0	0	0	0	0	0	38	103	0	0	0	0	0	0	0	0	0	48	126	0	0	0	0	0	0	0	0	0	0	0		
155	76	203	0	40	0	8	48	0	0	0	0	0	0	100	271	0	38	0	14	52	0	0	0	0	127	335	0	44	0	18	61	0	0	0	0	0	0		
156	18	48	0	0	0	0	0	0	0	0	0	0	0	24	65	0	0	0	0	0	0	0	0	0	30	79	0	0	0	0	0	0	0	0	0	0	0		
157	153	408	471	24	6	0	30	0	0	0	0	0	0	201	544	519	23	7	0	30	0	0	0	0	255	672	645	26	9	0	35	0	0	0	0	0	0		
158	95	253	0	1	0	2	3	0	0	0	0	0	0	125	339	0	1	0	3	4	0	0	0	0	159	419	0	1	0	4	6	0	0	0	0	0	0		
159	9	24	0	0	0	0	0	0	0	0	0	0	0	12	33	0	0	0	0	0	0	0	0	0	15	40	0	0	0	0	0	0	0	0	0	0	0		
160	98	261	0	11	0	0	11	0	0	0	0	0	0	129	349	0	10	0	10	10	0	0	0	0	164	432	0	12	0	0	12	0	0	0	0	0	0		
161	443	1,138	0	1,156	618	111	1,885	0	0	0	0	0	0	461	1,249	0	1,095	746	194	2,035	0	0	0	0	481	1,267	0	1,259	882	246	2,387	0	0	0	0	0	0		
162	213	520	0	3	0	0	3	53,300	0	0	0	0	0	222	601	0	3	0	0	3	57,643	0	0	0	0	231	609	0	3	0	0	3	66,115	0	0	0	0	0	
163	99	241	0	17	1	1,176	1,194	0	0	0	0	0	0	103	279	0	16	1	2,053	2,071	0	0	0	0	107	282	0	19	1	2,604	2,624	0	0	0	0	0	0		
164	172	531	0	11	0	4	15	0	0	0	0	0	0	179	485	0	10	0	7	17	0	0	0	0	187	493	0	12	0	9	21	0	0	0	0	0	0		
165	535	1,505	0	19	2	2	23	0	0	0	0	0	0	556	1,506	0	18	2	3	24	0	0	0	0	581	1,530	0	21	3	4	28	0	0	0	0	0	0		
166	383	1,125	0	218	302	117	637	0	0	0	0	0	0	398	1,078	0	206	365	204	775	0	0	0	0	416	1,096	0	237	431	259	928	0	0	0	0	0	0		
167	1,327	4,093	596	83	0	302	385	0	0	0	0	0	0	1,380	3,738	657	79	0	527	606	0	0	0	0	1,441	3,796	816	90	0	669	759	0	0	0	0	0	0		
168	69	203	0	29	6	37	72	0	0	0	0	0	0	72	195	0	27	7	65	99	0	0	0	0	75	198	0	32	9	82	122	0	0	0	0	0	0		
169	332	975	543	70	0	22	92	0	0	0	0	0	0	345	935	599	66	0	38	105	0	0	0	0	360	948	743	76	0	49	125	0	0	0	0	0	0		
170	64	181	0	0	0	0	0	0	0	0	0	0	0	111	301	0	0	0	0	0	0	0	0	0	165	435	0	0	0	0	0	0	0	0	0	0	0		
171	42	119	0	247	78	43	368	0	0	0	0	0	0	73	198	0	234	94	75	403	0	0	0	0	108	284	0	269	111	95	476	0	0	0	0	0	0		
172	5	14	0	0	0	0	0	30,600	0	0	0	0	0	9	24	0	0	0	0	0	33,094	0	0	0	0	13	34	0	0	0	0	0	37,957	0	0	0	0	0	
173	64	181	0	0	0	0	0	9,800	0	0	0	0	0	111	301	0	0	0	0	0	10,599	0	0	0	0	165	435	0	0	0	0	0	12,156	0	0	0	0	0	
174	205	579	0	0	0	0	0	0	0	0	0	0	0	356	964	0	0	0	0	0	0	0	0	0	528	1,391	0	0	0	0	0	0	0	0	0	0	0		
175	134	379	880	62	0	2	64	0	0	0	0	0	0	233	631	970	59	0	3	62	0	0	0	0	345	909	1,204	68	0	4	72	0	0	0	0	0	0		
176	219	619	0	42	0	64	106	0	3	0	0	0	0	380	1,029	0	40	0	112	152	0	4	0	0	0	564	1,486	0	46	0	142	187	0	4	0	0	0		
177	55	155	0	0	0	0	0	0	0	0	0	0	0	95	257	0	0	0	0	0	0	0	0	0	142	374	0	0	0	0	0	0	0	0	0	0	0		
178	180	509	0	0	0	0	0	0	0	0	0	0	0	312	845	0	0	0	0	0	0	0	0	0	463	1,220	0	0	0	0	0	0	0	0	0	0	0		
179	443	1,252	0	16	0	13	29	0	18	0	0	0	0	769	2,083	0	15	0	23	38	0	21	0	0	1,140	3,003	0	17	0	29	46	0	24	0	0	0	0		
180	2	6	0	0	0	0	0	0	0	0	0	0	0	3	8	0	0	0	0	0	0	0	0	0	5	13	0	0	0	0	0	0	0	0	0	0	0		
181	53	150	0	0	0	0	0	0	2	0	0	0	0	92	249	0	0	0	0	0	0	2	0	0	0	136	358	0	0	0	0	0	3	0	0	0	0	0	
182	175	494	0	91	23	52	166	0	0	0	0	0	0	304	823	0	86	28	91	205	0	0	0	0	451	1,188	0	99	33	115	247	0	0	0	0	0	0		
183	5	14	0	0	0	0	0	0	0	0	0	0	0	9	24	0	0	0	0	0	0	0	0	0	13	34	0	0	0	0	0	0	0	0	0	0	0	0	
184	244	689	0	20	0	17	37	0	0	0	0	0	0	424	1,149	0	19	0	30	49	0	0	0	0	628	1,654	0	22	0	38	59	0	0	0	0	0	0		
185	944	3,135	0	49	0	57	106	0	0	0	0	0	0	1,481	4,012	0	46	0	100	146	0	0	0	0	2,094	5,516	0	53	0	126	180	0	0	0	0	0	0		
186	50	166	0	44	108	166	318	0	0	0	0	0	0	78	211	0																							

TAZ	Hawaii Island - Socio-Economic Data Year 2007													Hawaii Island - Socio-Economic Data Year 2020 Forecast													Hawaii Island - Socio-Economic Data Year 2035 Forecast																				
	EMPLOYMENT							VISITORS						EMPLOYMENT							VISITORS						EMPLOYMENT							VISITORS													
	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHLENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	PASNGR	HARBOR TONS	HARBOR PSNGR								
211	100	260	0	3	0	5	8	0	0	0	0	0	0	104	282	0	3	0	9	12	0	0	0	0	0	0	109	287	0	3	0	11	14	0	0	0	0	0	0	0	0						
212	155	404	0	7	2	0	9	0	0	0	0	0	0	161	436	0	7	2	0	9	0	0	0	0	0	0	168	443	0	8	3	0	10	0	0	0	0	0	0	0	0						
213	168	437	0	0	0	6	6	0	0	0	0	0	0	175	474	0	0	0	10	10	0	0	0	0	0	0	182	479	0	0	0	13	13	0	0	0	0	0	0	0	0						
214	467	1,513	154	40	3	25	68	0	0	0	0	0	0	486	1,316	170	38	4	44	85	0	0	0	0	0	507	1,336	211	44	4	55	103	0	0	0	0	0	0	0	0	0						
215	40	130	0	0	0	0	0	157,900	0	0	0	0	0	42	114	0	0	0	0	0	170,767	0	0	0	0	0	43	113	0	0	0	0	0	195,864	0	0	0	0	0	0	0	0					
216	7	23	0	92	0	0	92	0	0	0	0	0	0	7	19	0	87	0	0	87	0	0	0	0	0	8	21	0	100	0	0	100	0	0	0	0	0	0	0	0	0						
217	417	1,311	0	60	0	3	63	0	0	0	0	0	0	643	1,742	0	57	0	5	62	0	0	0	0	0	901	2,373	0	65	0	7	72	0	0	0	0	0	0	0	0	0						
218	883	1,820	470	121	20	56	197	0	0	0	0	0	0	1,362	3,689	518	115	24	98	237	0	0	0	0	0	1,908	5,026	643	132	29	124	284	0	0	0	0	0	0	0	0	0	0					
219	467	1,468	0	8	0	5	13	0	0	0	0	0	0	720	1,950	0	8	0	9	16	0	0	0	0	0	1,009	2,658	0	9	0	11	20	0	0	0	0	0	0	0	0	0	0					
220	300	618	0	0	0	0	0	0	0	0	0	0	0	463	1,254	0	0	0	0	0	0	0	0	0	0	648	1,707	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
221	883	1,820	0	0	0	0	0	100,000	0	0	0	0	0	1,362	3,689	0	0	0	0	0	108,149	0	0	0	0	0	1,908	5,026	0	0	0	0	0	124,043	0	0	0	0	0	0	0	0	0				
222	367	862	0	0	0	0	0	0	0	0	0	0	0	450	1,219	0	0	0	0	0	0	0	0	0	0	544	1,433	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
223	703	1,651	0	345	99	155	599	11,900	0	0	0	0	0	1,084	2,936	0	327	120	271	717	12,870	0	0	0	0	1,519	4,001	0	376	141	343	860	14,761	0	0	0	0	0	0	0	0	0					
224	111	302	0	0	0	0	0	0	0	0	0	0	0	171	463	0	0	0	0	0	0	0	0	0	0	240	632	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
225	28	76	0	0	0	0	0	0	42	0	0	0	0	43	116	0	0	0	0	0	49	0	0	0	0	60	158	0	0	0	0	0	56	0	0	0	0	0	0	0	0	0					
226	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
227	25	68	0	0	0	0	0	0	0	0	0	0	0	39	106	0	0	0	0	0	0	0	0	0	0	54	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
228	1,493	4,066	654	92	0	26	118	0	0	0	0	0	0	2,303	6,238	721	87	0	45	133	0	0	0	0	0	3,226	8,498	895	100	0	58	158	0	0	0	0	0	0	0	0	0	0	0	0			
229	336	789	60	9	0	3	12	0	0	0	0	0	0	518	1,403	66	9	0	5	14	0	0	0	0	0	726	1,912	82	10	0	7	16	0	0	0	0	0	0	0	0	0	0	0	0			
230	6	33	0	0	0	0	0	0	0	0	0	0	0	9	24	0	0	0	0	0	0	0	0	0	0	13	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
231	369	2,029	2,424	577	94	136	807	0	140	0	0	0	0	569	1,541	2,672	546	113	237	897	0	164	0	0	0	797	2,099	3,317	628	134	301	1,064	0	188	0	0	0	0	0	0	0	0	0	0			
232	200	526	0	0	0	51	51	0	0	0	0	0	0	245	664	0	0	0	89	89	0	0	0	0	0	296	780	0	0	0	113	113	0	0	0	0	0	0	0	0	0	0	0	0			
233	11	29	0	0	0	0	0	0	0	0	0	0	0	13	35	0	0	0	0	0	0	0	0	0	0	16	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
234	210	553	0	4	0	0	4	0	0	0	0	0	0	257	696	0	4	0	0	4	0	0	0	0	0	311	819	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0			
235	67	176	0	0	0	0	0	0	0	0	0	0	0	82	222	0	0	0	0	0	0	0	0	0	0	99	261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
236	1	3	0	91	32	153	276	1,467,779	0	0	0	0	0	1	3	0	86	39	267	392	1,587,390	0	0	0	0	0	1	3	0	99	46	339	484	1,820,680	0	0	0	0	0	0	0	0	0	0			
237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
238	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
239	1	3	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
240	4	11	0	0	0	0	0	0	0	0	0	0	0	5	14	0	0	0	0	0	0	0	0	0	0	6	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
241	469	1,234	516	235	15	81	331	0	0	0	0	0	0	575	1,558	569	223	18	141	382	0	0	0	0	0	695	1,831	706	256	21	179	457	0	0	0	0	0	0	0	0	0	0	0	0	0		
242	88	232	414	66	0	7	73	0	0	0	0	0	0	108	293	456	62	0	12	75	0	0	0	0	0	130	342	567	72	0	16	87	0	0	0	0	0	0	0	0	0	0	0	0	0		
243	30	79	0	0	0	0	0	0	0	0	0	0	0	37	100	0	0	0	0	0	0	0	0	0	0	44	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
244	29	76	0	26	0	16	42	0	6	0	0	0	0	36	98	0	25	0	28	53	0	7	0	0	0	43	113	0	28	0	35	64	0	8	0	0	0	0	0	0	0	0	0	0	0		
245	24	63	0	0	0	0	0	0	0	0	0	0	0	29	79	0	0	0	0	0	0	0	0	0	0	36	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
246	365	961	0	0	0	0	0	0	0	0	0	0	0	447	1,211	0	0	0	0	0	0	0	0	0	0	541	1,425	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
247	120	316	0	29	0	16	45	0	0	0	0	0	0	147	398	0	27	0	28	55	0	0	0	0	0	178	469	0	32	0	35	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
248	1,079	2,840	0	16	0	0	16	25,900	0	0	0	0	0	1,322	3,581	0	15	0	0	15	28,011	0	0	0	0	1,599	4,212	0	17	0	0	17	32,127	0	0	0	0	0	0	0	0	0	0	0	0	0	
249	23	61	0	0	0	0	0	0	0	0	0	0	0	33	89	0	0	0	0	0	0	0	0	0	0	45	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
250	116	305	0	1	0	0	1	0	0	0	0	0	0	169	458	0	1	0	0	1	0	0	0	0	0	229	603	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	33	87	0	0	0	0	0																																								



Appendix E

Public Involvement Summary

Public Involvement Summary for the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii

Introduction

Public involvement was a key component in the development of the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii (Plan). A public involvement plan was formulated at the beginning of the Plan development process to ensure that public and stakeholder participation would be integrated into Plan development and help shape the Plan. This appendix provides a summary of the public and stakeholder involvement and describes the decision-making structure and process.

HDOT's Public Involvement Policy

The State of Hawaii Department of Transportation (HDOT) is committed to a comprehensive and fair public involvement process. As stated in the HDOT's *Public Involvement Policy*, dated May 2009, the HDOT "...recognizes the value of public involvement as a programmatic measure that strengthens and solidifies its transportation programs... The HDOT Public Involvement Policy supports and encourages broad-based public involvement in the conception, development, and enhancement of transportation plans, programs, and projects."

Goals of the Public Involvement Plan

The HDOT was committed to an approach that:

- Increased public awareness and understanding of the transportation planning process in Hawaii.
- Provided an open and transparent decision-making process that was conducted through equitable and constructive two-way communication between the project team and the public.
- Provided early and ongoing opportunities for stakeholders to raise issues and concerns for consideration by the project team.
- Met applicable state and federal laws, regulations, policies, and procedures.
- Proactively informed and encouraged the participation of all stakeholders regardless of race, ethnicity, age, disability, income, or primary language, in accordance with the Federal Highway Administration Title VI and Environmental Justice guidance. Encouraged broad citizen participation, including citizens who have traditionally been underserved and underrepresented, such as minority and low-income populations.
- Stimulated a broad-based interest in the HDOT's planning activities and builds widespread community understanding of findings and decisions.

Plan Development Process and Stakeholder Involvement

A key element of the approach to developing the Plan was a structured and transparent planning process that clearly identified major tasks and decision points. Thorough and thoughtful consideration of issues during major tasks by all of the project stakeholder groups helped to ensure quality decisions that would not have to be revisited later in the project because something of significance had been omitted or improperly addressed. Public and stakeholder involvement activities, such as meetings and workshops, were integrated into the work plan so that the stakeholder input could shape the decisions made during major tasks in the planning process.

The primary avenues for stakeholder input and discussion were through a Policy Committee (PC), a Technical Advisory Committee (TAC), a Stakeholder Advisory Committee (SAC), and general public meetings. A Hawaii District-specific Citizen Advisory Committee (CAC) was not formed due to the low number of applications received. The SAC provided specific input to Hawaii District. Four out of twenty SAC members were from the Hawaii District. Stakeholder groups, roles, and responsibilities are described in subsequent sections under Stakeholder Involvement.

Additional outreach avenues included flyers, public notices, HDOT press releases, a Facebook page, and a project website. Public comments were also received through mail, email, and phone. More information on the major tasks and the role of public and stakeholder input in shaping the outcome of the task, as well as concerns expressed by the stakeholders is provided in subsequent sections below.

Plan Development Process

The Statewide Federal-Aid Highways 2035 Transportation Plan and Hawaii District’s Regional Federal-Aid Highways 2035 Transportation Plan were developed concurrently in an open and comprehensive process through a series of milestones. The process is described below and shown on Figure 1.

Establish Goals and Objectives – This milestone focused on reviewing existing regulatory and policy requirements related to land transportation, and developing project goals and objectives for the long-range land transportation system.

Gather Data and Develop Model – This milestone included gathering data and information related to the land transportation system and current HDOT programs. A major portion of the task included developing/updating the regional travel demand models, which were the basis for forecasting and assessing future traffic conditions.

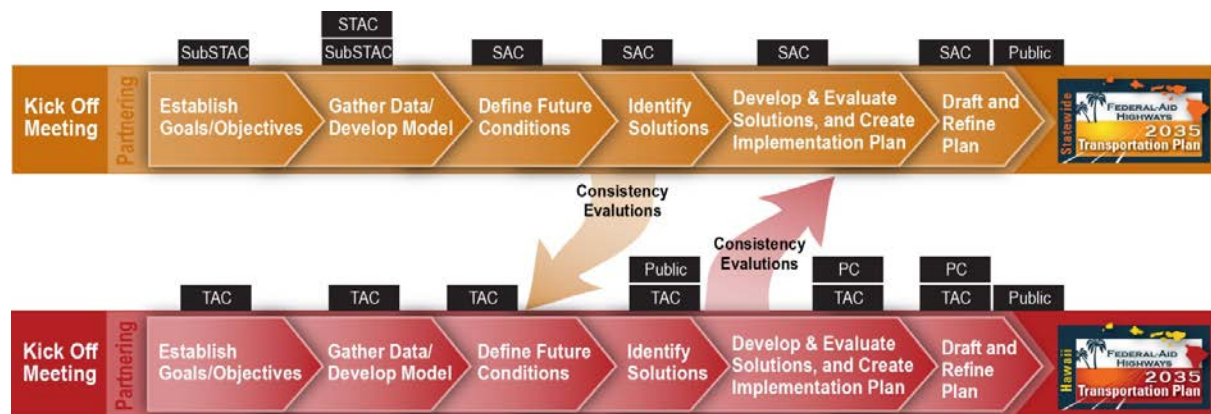


FIGURE 1
Project Development Process

Define Future Conditions – Based on the forecasting results and endorsed program definitions, this milestone focused on identifying future system deficiencies and developing the plan priorities and evaluation criteria.

Identify Solutions – This milestone focused on developing potential solutions to address overall plan policies, goals and objectives, and identified transportation needs and deficiencies. Funding sources, allocations, and financing strategies were also identified.

Develop and Evaluate Solutions and Create Implementation Plan – This milestone focused on evaluating the potential solutions against requirements and plan goals and objectives and creating implementation recommendations.

Draft and Refine Plans – This milestone documented the project development process, analyses, and recommendations for the Plan. The document was refined and finalized based on stakeholder comments and input.

Stakeholder Involvement

Throughout the development of the Plan, participation by a diverse group of stakeholders at various levels was sought and their various viewpoints were incorporated. Stakeholder groups acted in an advisory capacity for the project. The overall goal of stakeholder group facilitation was to provide the HDOT Director of Transportation clear, comprehensive, and defensible recommendations for approval.

The following sections summarize the specific involvement of the TAC, PC, SAC, and the general public through public meetings, project website, social media, emails, and phone calls.

Technical Advisory Committee

The TAC consisted of senior managers from the HDOT and County departments. The TAC provided significant technical input throughout the development of the Plan. TAC member agencies are shown in Table 1.

TABLE 1
TAC Member Agencies

County of Hawaii - Department of Public Works
County of Hawaii - Planning Department
County of Hawaii - Mass Transit Agency
County of Hawaii - Civil Defense Agency
County of Hawaii - Police Department
County of Hawaii – Fire Department
HDOT Hawaii District Office

Responsibilities of TAC were to:

- Represent the interests of their agencies or jurisdictions.
- Provide technical support, information, insight, and reviews.
- Communicate project progress to their directors, elected or appointed officials, and to agency or jurisdictional colleagues as needed.

- Review recommendations from the public and project team, review background materials and make informed, comprehensive recommendations at the milestones of the project. The decisions made by the TAC were recommendations to the PC.

Throughout the development of the Plan, five TAC meetings were held in addition to the two PC/TAC joint meetings. Below are summaries of the TAC meetings.

TAC Meeting #1, May 25, 2010, 9:00 am to noon

- **Project Overview.** The TAC was given an overview of the project: project background, project purpose, development process, framework, and stakeholder involvement.
- **Goals and Objectives.** The TAC started a discussion on goals and objectives. Goals and objectives were framed around the federal planning factors to ensure a comprehensive land transportation plan. The TAC also provided input on a list of existing plans and policies. The existing plans and policies were reviewed to ensure that the Plan is compliant and aligned with adopted plans and requirements.
- **Stakeholder Involvement.** The TAC provided comments in regards to the draft list of categories for the CAC and the SAC. The TAC also provided input on public outreach techniques that have worked/not worked for their specific region.
- **Data Collection.** The TAC briefly talked about data collection. The TAC was asked to assist in gathering land use, population, economic, and transportation facility data for the development of the travel demand model.

TAC Meeting #2, July 19, 2010, 9:30 am to 12:30 pm

- **Project Objectives and Outcomes.** The project objectives and outcomes were further clarified based on comments received to ensure everyone had a common understanding of the project.
- **Goals and Objectives.** The TAC discussed major topics related to long-term goals and objectives for HDOT's transportation system, which included secondary access, intermodal connectivity, facilities for specific modes, connectivity between subdivisions/interior roadway systems, capacity improvements, safety enhancements, diversity of funding sources, land use/transportation network compatibility, and agency resource coordination (such as, real-time data).
- **Travel Demand Model.** The TAC discussed the travel demand model data needs and desired analysis capabilities. Output/capabilities of the model would depend on goals defined for the Plan.

TAC Meeting #3, February 23, 2011, 9:30 am to 1:00 pm

- **Finalized Goals and Objectives.** A final draft of goals and objectives was presented. The TAC was asked to provide their final comments. The final draft was revised based on input from the TAC and SAC.
- **Solution Evaluation Process.** The draft solution evaluation and prioritization process was presented and discussed. The TAC felt that the process is fair and it's good to have a transparent process.
- **Travel Demand Model.** The travel demand model efforts were discussed. The model was used to identify capacity needs. The TAC reviewed the traffic analysis zones (TAZs). The TAC was also asked to assist with defining future conditions and land use forecast.

TAC Meeting #4 (via videoconference), June 2, 2011, 1:00 pm to 4:00 pm

- **Prioritized Goals and Objectives.** The SAC’s prioritization results were shared with the TAC. TAC members were able to identify their personal top five priorities. The TAC agreed to come up with the rest of priorities and reach to a consensus via email in a few weeks.
- **Finalized Solution Evaluation Process.** The TAC reviewed changes made to the last draft Solution Evaluation Process memo and agreed with the changes. The TAC provided input on county programs that administer projects on the federal-aid highways and how those projects are prioritized. The TAC also shared any gaps in current programs and any foreseeable needs in the future.
- **Future Needs.** The TAC reviewed a list of committed and potential capacity projects taken from previous plans and the STIP, and provided status updates and project details. The TAC also provided input on non-capacity needs.

TAC Meeting #5, November 9, 2011, 9:00 am to noon

- **Goal Priorities.** The TAC reviewed the resulting goal priorities for Hawaii District. The TAC felt that the top priorities are consistent with the District’s priorities.
- **Draft Evaluation Criteria.** The TAC reviewed the draft evaluation criteria that would be used to evaluate the potential solutions. The TAC also reviewed the evaluation criteria’s data sources and grading.
- **Socioeconomic Data.** The TAC reviewed and provided comments on the land use and socioeconomic data and how the data were used to develop the future forecasts. Growth in employment and households was identified.
- **Travel Demand Model.** The TAC reviewed the 2007 based traffic condition and the 2035 no build traffic condition generated by the model. The TAC discussed where the existing capacity deficiencies are and where the future capacity deficiencies are projected.
- **Future Needs and Potential Solutions.** The TAC reviewed an initial list of potential solutions that had been developed based on the travel demand model output, existing plans/policies, and stakeholder input. The TAC validated the potential solutions and provided additional input on a set of maps.

Policy Committee

The PC consisted of directors of the HDOT and County departments. The PC provided high-level insight to the development of the Plan relative to overall state and county goals. Members of the PC represented the agencies shown in Table 2.

TABLE 2
Policy Committee Agencies

State of Hawaii - Department of Transportation
County of Hawaii - Department of Public Works
County of Hawaii - Planning Department
County of Hawaii – Mass Transit Agency

Responsibilities of the PC were to:

- Represent the policy and administrative interests of their agencies or jurisdictions.
- Commit staff support for participation in the development of the plans.

- Communicate project progress to their elected or appointed officials, and to agency or jurisdictional colleagues as needed.
- Review recommendations from the TAC, and provide review as related to policy, administration, and transportation programs.

The PC met two times during the plan development process to review the solution evaluation process and results, provide input regarding programming strategies, and provide comments on the draft Plan. The PC was accompanied by the TAC.

Below are summaries of the PC/TAC meetings.

PC/TAC Joint Meeting #1, May 2, 2013, 8:30 am to 11:30am

- **Project Overview.** The PC was provided an overview of the project – its background and framework, relationship to the Statewide Transportation Planning process, goals and objectives, and the overall development process. The PC was also briefed on how the future conditions were defined and the process of how the needs and opportunities were identified for each mode of travel.
- **Solution Evaluation Process and Results.** The PC and TAC reviewed and commented on the Solution Evaluation Process and results. The Solution Evaluation Process was used to evaluate potential solutions against requirements and plan goals and help set the program priorities.
- **Implementation Strategies.** The PC and TAC discussed implementation strategies. The PC and TAC were also briefed on the implementation process, projection of available funding, and historic and proposed funding distribution. In general, the PC and TAC were comfortable with the proposed funding distribution.
- **Draft Plan.** An annotated draft outline for the Plan was presented. The PC and TAC were asked to provide comments.

PC/TAC Joint Meeting #2, February 7, 2014, 12:30 pm to 2:00 pm

- **Draft Plan.** The PC and TAC were given an overview of the draft Plan by chapter and were asked to provide comments.

Stakeholder Advisory Committee (SAC)

The SAC were volunteers selected by the HDOT through an application process. The SAC was a statewide comprehensive community, business, and special interest focus group that represented a wide range of transportation system users, communities, geographic areas, ages, and diverse populations. Four members were from the Maui District. SAC member’s categories are shown in Table 3.

TABLE 3
SAC Member Categories

Transit	Health	Higher Education	ADA
Freight	Utilities	Pedestrian	Military
Development Community	Environment	Bicycle	Elderly
Visitor Industry	Sustainability	School	Car
Business Community	Energy	Safety	
Residential Community	Cultural		

Responsibilities of SAC members were to:

- Represent their constituents' perspectives during group deliberations.
- Communicate project progress with their constituents.
- Provide feedback at key milestones throughout the project. Provide input prior to distribution of key materials at public workshops.
- Act as ambassadors for the project.
- Share information and solicit feedback from their representative stakeholders.
- Provide recommendations to HDOT.

Throughout the development of the Plan, four SAC meetings were held. Below are summaries of the SAC meetings.

SAC Meeting #1, November 8, 2010, 9:00 am to noon

- **Project Overview.** The SAC was given an overview of the project: project background, project purpose, development process, and project framework.
- **Goals and Objectives.** The SAC reviewed and provided feedback on the goals and objectives for the Plan. Goals and objectives were framed around the federal planning factors to ensure a comprehensive land transportation plan. A draft Goals and Objectives memo was provided to the SAC
- **Future Conditions.** The Plan and Policy Review memos were also provided to the SAC. The SAC was asked to provide comments and information on other plans and developments.

SAC Meeting #2, March 4, 2011, 9:00 am to noon

- **Solution Evaluation Process.** A brief overview of the draft solution evaluation and prioritization process was introduced. The intent was to provide a general overview and obtain comments from the SAC.
- **Prioritized Goals and Objectives.** The SAC was given a final set of goals and asked to prioritize the goals. The SAC prioritized the goals individually and then an average score was taken for each goal. The SAC discussed the results and adjusted the scores accordingly until a group consensus was reached.
- **Travel Demand Model.** The SAC examined and provided feedback on the existing transportation networks for the Districts of Maui, Hawaii, and Kauai: functional classification, speed, lanes, and traffic analysis zones. The SAC also discussed and shared input on the future networks and land use assumptions.

SAC Meeting #3, April 2, 2012, 1 pm to 4 pm

- **Goal Priorities.** The SAC provided a final review of the goal prioritization process and results.
- **Socioeconomic Data.** The SAC reviewed the land use and socioeconomic data and how the data were used to develop the future forecasts. Growth in employment and households was identified and illustrated.
- **Travel Demand Model.** The SAC reviewed the 2007 based traffic condition and the 2035 no build traffic condition generated by the model. The SAC discussed where the existing capacity deficiencies are and where the future capacity deficiencies are projected.

- **Future Needs and Potential Solutions.** The SAC reviewed input from the TACs and the first series of public meetings on needs and potential solutions. The SAC validated the potential solutions and provided additional input.
- **Solution Evaluation Process.** The solution evaluation and prioritization process were discussed in detail. The discussion was focused on the Tier 1 and Tier 2 evaluation, and examples were provided.

SAC Meeting #4, December 13, 2013, 9:00 am to 11:00 am

- **Draft Plan.** The SAC was given an overview of the draft Plan by chapter and asked to provide comments.

Public Involvement

Various methods and tools were used to engage the general public to follow the project’s progress and provide input at specific project milestones.

Public Meetings

Two rounds of two public meetings each were held in the Hawaii District. The public meetings were structured in an interactive format so that attendees were able to share their community values, concerns, opportunities, and priorities, as well as validate the information already gathered and provide additional input. The agenda and presentation materials were posted on the project website.

Below are summaries of the public meetings.

Public Meeting #1, February 28, 2012 (Kona) and February 29, 2012 (Hilo), 5:30 pm to 7:30 pm

The goals of the first public meeting were to introduce the project and gather input on land transportation deficiencies and needs. A presentation was given and followed by a small group exercise to identify the deficiencies and needs. The groups provided their comments on a set of maps and presented their needs to the large group. Attendees also talked to project staff and provided written and verbal feedback. The specific topics covered during the meeting are described below.

- **Project Background and Framework.** Attendees were given information on the project background and framework – what the Plan is about, why the Plan is necessary, and how it will be developed. The project management team also explained the Solution Evaluation Process and how it would help identify the priorities.
- **Project Status and Information.** The project management team reviewed what had been done to date and provided an update on current status. The project management team also went through the existing and forecast socioeconomic data, as well as the present and future travel demands.
- **Identify Deficiencies and Needs.** Attendees split into groups to identify deficiencies, needs, and opportunities on a set of large maps. Input was facilitated and framed around the eight federal planning factors. Each group presented results to the larger group so everyone was aware of the information shared. A summary of their input was shared with the SAC and TAC and is described below.
 - Economic Vitality
 - New and bypass roadways – address capacity needs on Keeau-Pahoa Road, Puna secondary access, Kawaihae Bypass, makai arterial/parkway (Alii Parkway, Ane

- Keohokalole Highway), Saddle Road extension, new route from Mountain View to Saddle Road that doesn't go through Hilo
- Improve circulation – more connectivity in Waimea area (eliminate cul-de-sacs), Kona mauka-makai routes (Laaloa, Lako, Royal Poinciana, Nani Kailua)
 - Security/Safety
 - Address high accident corridors/locations – Keeau-Pahoia corridor is characterized by high accident rates/occurrences, Akoni Pule Highway/Kawaihae Harbor area
 - Improve roadway and shoulder width – uphold a minimum width for safety, bike use etc.
 - Add/improve guardrails – fix end treatments/attenuators and protect areas with drop-offs
 - Modal Integration
 - Pedestrian/bicycle facilities – bicycle lanes between Kailua and Hawi, add bicycle and pedestrian route along Keeau-Pahoia Road, provide safe routes to school between Konawaena to Captain Cook
 - Public transit – provide islandwide service and increase frequencies

Public Meeting #2, March 19, 2014 (Kona) and March 20, 2014 (Hilo), 5:30 pm to 7:30 pm

The goals of the second public meeting were to share the draft Plan and get feedback from the public. The first part of the meeting provided an overview of the draft Plan by chapter in a presentation format. The second part of the meeting was intended to be a small group exercise, where attendees would simulate a process to prioritize projects and allocate limited funds. Questions and comments were taken throughout the meetings. Attendees also talked to project staff and provided written and verbal feedback.

Kona Public Meeting

In Kona, the public was very engaged. They preferred an interactive presentation of the draft Plan and questions and comments were entertained throughout the evening. The public appreciated the engagement and the small group exercise was cancelled in order to provide more time for comments and discussion by the group as a whole.

Below is a summary of questions and comments received at the meetings.

1. What does “preserve and maintain the existing transportation system” mean?

Response: It means that you maintain your existing transportation system regularly and are doing what’s needed to repair and rehabilitate to keep the system operating. Examples of system preservation projects are overlaying of the pavement and replacement of old signs.

2. Someone asked to verify the socioeconomic data assumptions, especially in the Puna and Waimea areas. It seems inconsistent from county data.

3. Does the development of the Statewide Transportation Improvement Program (STIP) involvement the public?

Response: Yes. The HDOT is updating the STIP for Fiscal Year 2015. A series of public meetings will be held in April and May this year.

4. How is this long-range plan linked to the STIP?

Response: The long-range plan and the STIP will be bridged by a mid-range plan, which is fiscally constrained. The mid-range plan provides a roadmap to the future that is consistent with the long-range plan and serves as an opportunity to make any necessary corrections in funding priorities in the STIP.

5. For the Tier 2 Evaluation, how do you know whether or not there are any cultural impacts if you have not done an environmental assessment yet?

Response: The Tier 2 Evaluation criteria were based on documented data. For example, data from the State Historic Preservation Division were used to evaluate if the potential solution will have impacts on archaeological or cultural resources. In addition, this evaluation is just a tool to compare different potential solutions. When the project gets to the project development phase, it still needs to go through the required environmental process.

6. Someone provided validation that the Saddle Road Extension is an important project for the region’s economic vitality.
7. Can we still have a CAC?

Response: No, not at this point of the process. The project is near completion. The SAC had representatives from the District of Hawaii.

Hilo Public Meeting

Hilo attendees had the opportunity to do the small group exercise. Attendees were given a budget of \$100 to construct a range of land transportation projects that they felt best supported the future land transportation goals. The cost of the projects ranged from \$2 to \$55. General project descriptions, project benefits, and consequences if not built/implemented were provided. Attendees discussed their selection of projects amongst their group and presented their group’s recommendations to the larger group. Table 4 shows the groups’ recommendations on how the funds should be allocated.

TABLE 4
Small Group Exercise Results

Program	Group 1	Group 2	Group 3
System Preservation	\$18	\$53	\$45
Safety	\$2	\$13	\$21
Capacity	\$80	\$10	\$10
Congestion	\$0	\$24	\$22
Other	\$0	\$0	\$2
Total	\$100	\$100	\$100

In general, the public felt that it is important to add capacity to accommodate future growth, and improve local connectivity and modal integration. The public also felt that it is important to preserve the existing land transportation system, especially the bridges, which are often the only access to communities. The public felt that the decision-making process is complex and had a greater understanding of the process that the decision-makers need to go through. They expressed a desire to develop ways to increase funding and improve land use decisions.

Other questions and comments raised at the meeting are summarized below.

1. The number of households in Puna is underestimated. Additional studies are needed to re-assess the future condition and better plan to accommodate the growth. In addition, preserve the coastal highway, Route 137.
2. Consider mode shift and expanded transit service to help alleviate congestion.
3. Need to address land use and biological impacts from highway construction. Ensure that managing invasive species is accounted for in safety, environment, maintenance, and construction.
4. Widen collector roads and improve local connection to help address congestion
5. Continue to address and enhance safety
6. System preservation – preserve the existing transportation system, especially the bridges, where often are the only access to communities.
7. Consider increasing the percentage of State Highway funds to the Hawaii District given that the Hawaii District has twice as many miles of roads than any other district and its residents travel twice the distance for work, school, and emergency services. In addition, there is greater projected need and more room for new highway routes.

Response: There are multiple factors in determining how the funds are distributed, i.e. revenue, average daily traffic volume, vehicle miles traveled, and population etc.

8. Some of the funding and non-funding strategies seem beyond the HDOT’s jurisdiction and some do not seem feasible for the Hawaii District.

Response: The list of funding and non-funding strategies is a “brainstorm” list. The project management team understands that there is no one solution that will address all the needs, but every little effort counts. Some of the strategies listed would require legislative action. One of the primary goals of the Plan is to provide guidance to decision-makers to explore all options.

Project Website

A project website (www.hawaiilongrangeplan.com) was developed and maintained throughout the plan development process. The project website provided a venue to facilitate two-way communication between the public and the project management team. Through the website, the project management team was able to share project information, announce involvement opportunities, and receive comments and feedback. A few comments were received via the website in regards to potential projects in Waimea. The project management team reviewed all the recommendations and incorporated relevant findings into the Plan.



Social Media

A Facebook page was created and managed throughout the plan development process. The Facebook page was primarily used to broadcast project updates to Facebook users and direct them to the project website for more information. The Facebook page allowed users to share information with their friends and helped promote the project.

Friends E-mail List

A “Friends” e-mail list was also developed and maintained throughout the plan development process. The Friends e-mail list included:

- Public agencies
- Elected officials
- State and County Environmental Justice/Title VI coordinators
- Business, community, interest groups, and private organizations
- Individuals (property owners, residents, and other citizens)

Friends on the e-mail list received project status updates and notices of SAC and public meetings. Friends were also notified via email when materials were posted on the project website for input.

Flyers

Flyers were created and distributed to inform the public in regards to the SAC and CAC opportunities and the public meetings. Flyers were mailed to contacts on the project mailing list, which included stakeholder groups that were listed on the Title VI/EJ Dynamic Outreach list provided by the HDOT Title VI/EJ specialist (June 2010). The project mailing list was also supplemented with the Statewide Pedestrian Master Plan outreach list, which included libraries, senior centers, colleges, health centers, charities, community associations/neighborhood boards, related community interest groups, child and family service centers, chambers of commerce, cultural clubs, Office of Hawaiian Affairs, developers, veteran centers, business and professional

associations, clinics, and tourism associations. Over 100 stakeholder groups located in the Hawaii District received the flyers.

The flyers were also emailed to the PC, TAC, SAC, and related government agencies for distribution.

News Media Outreach and Coordination

Public notices were placed on the Hawaii News and the Star-Advertiser to announce the SAC and CAC opportunities and public meetings. In addition, the HDOT also prepared press releases and reached out to members of the news media to encourage media coverage regarding public involvement opportunities. The project received news coverage on the *Big Island Weekly*, *Damon Tucker: Hawaii News & Information* (<http://damontucker.com>), *Hawaii24/7* (<http://www.hawaii247.com>), *KHON2*, *KonaWeb* (<http://konaweb.com>), and *West Hawaii Today* in February 2012, and on *Hawaii Herald-Tribune* in February and March 2012.

Emails, Phone Calls, and Letters

Over the course of the Plan's development, the public was able to provide comments and raise questions through emails, phone calls, and letters. Comments were received via emails in regards to the plan development process, meeting logistics, and potential solution recommendations.

Additional Approaches for SAC and CAC Solicitation

In addition to making the announcements through public notices, HDOT press releases, the project website, Facebook page, flyers, and emails, several other approaches were taken concurrently to solicit membership for the SAC and the CAC. These approaches and efforts are described below.

Other Projects - Public Meetings

The project management team staff attended public meetings for other related projects to promote the SAC and CAC opportunities. The project management team staff attended and distributed flyers and applications at the CAC meetings and public meetings for the Statewide Pedestrian Master Plan, and public meetings for the Hawaii Statewide Transportation Plan. The opportunities were also promoted at public meetings for the Oahu Regional Transportation Plan with a project display board and staff to answer questions.

Internet

The SAC and CAC opportunities were announced on the HDOT Website (<http://hawaii.gov/dot>).

Focused Outreach

Additional outreach was also done to focus on potential candidates, by the project management team and associates. The project management team staff also reached out to applicants and colleagues for suggestions on other potential candidates. Several contacts were obtained from the Hawaii Statewide Transportation Plan 2002 CAC List.

The project management team's Public Involvement Specialist located in Hawaii District reached out to some candidates by phone. Unfortunately, the candidates could not commit to apply for a position due to their busy schedules and commitments to other projects and services.



Appendix F

Process for Solution Evaluation and Results

Statewide Federal-Aid Highways 2035 Transportation Plan and Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai

Process for Solution Evaluation (District of Hawaii)

PREPARED FOR: State of Hawaii Department of Transportation

PREPARED BY: CH2M HILL

DATE: November 29, 2012

Introduction

This memorandum outlines the process for evaluating and prioritizing solutions for the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii (Plan).

As part of the development of the Plan, the federal-aid highways within the District of Hawaii were analyzed for problems related to existing and anticipated congestion, safety, security, mobility, preservation, and connectivity. Solutions were then developed to address the identified problems. The solutions are prioritized using a logical process for two reasons: (1) to ensure that a combination of community, local agency, state agency and other stakeholder input helps shape the priorities for solution implementation on the district highway system; and (2) to assist the State of Hawaii Department of Transportation (HDOT) in project programming by identifying priority solutions.

Solution evaluation consists of a seven-step process, as shown on Figure 1. These steps are described in greater detail in the body of this memorandum.

FIGURE 1
Seven-step Process for Solution Evaluation



1. Finalize Goals

Step 1. Finalize Goals and Objectives for the Plans

Goals and objectives set the basic vision for any planning process and provide a framework for evaluating success once the plan has been implemented. The goals and objectives for the Plans are aligned with existing federal legislation (Moving Ahead for Progress in the 21st Century [MAP-21]), and state and local regulatory and policy requirements. The goals and objectives also incorporate input from stakeholders (community, local agencies, and state agencies). The set of goals and objectives used for this Plan is also used for the Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui and Kauai, and the Statewide Federal-Aid Highways 2035 Transportation Plan.

As described in the remainder of the memo, it is the *prioritizing* of these goals that may differ between the regional plans and the statewide plan.

Work with stakeholders resulted in 22 goals, which are organized into eight categories of planning factors. The eight planning factors are consistent with Federal Highways Administration (FHWA) guidance and are listed in no particular order:

- Environment and Sustainability
- Modal Integration
- System Preservation
- Security
- Economic Vitality
- System Efficiency Management and Operations
- Transportation Access Mobility
- Safety

A ninth “additional” category is also included to encompass goals that are not directly associated with the federal planning factors.

Table 1 includes the finalized goals, objectives, and strategies, categorized by planning factor.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: Environment and Sustainability		
<p>1.1. Preserve and enhance the natural environment, including biological and aesthetic resources.</p>	<ul style="list-style-type: none"> » Avoid, minimize, and provide reasonable measures to mitigate degradation of the natural environment caused by transportation facilities and operations. » Construct and maintain a transportation system that complements scenic corridors and protected views. » Provide transportation facilities that complement the natural environment and enhance quality of life. 	<ul style="list-style-type: none"> » Review environmental assessments to identify potential degradation of the natural environment caused by transportation facilities and operations. » Create categories of environmental mitigation to protect habitat and ecologically sensitive areas from potential impacts of transportation facilities and operations. » Develop and maintain landscape plans that preserve the scenic environment. » Improve the aesthetic quality of gateway roads. » Provide educational interpretive sites regarding preserving and enhancing the natural environment for public viewing at scenic pull-offs, and park-and-rides.
<p>1.2. Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.</p>	<ul style="list-style-type: none"> » Avoid, minimize, and provide reasonable measures to mitigate degradation of Hawaii's cultural resources environment caused by transportation facilities and operations 	<ul style="list-style-type: none"> » Review environmental assessments to identify potential degradation of cultural resources caused by transportation facilities and operations. » Create categories of environmental mitigation to protect culturally sensitive areas from potential impacts of transportation facilities and operations. » Develop a formal consultation process with Native Hawaiian Organizations. » Develop consistent and comprehensive processes for addressing cultural, natural, and historic resources. » Coordinate transportation corridor and public safety needs with the preservation of historical and cultural features.
<p>1.3. Meet the relevant environmental regulations and standards set by federal, state, and county/city agencies. Maintain collaborative working relationships with agencies and comply with goals of their relevant plans and policies.</p>	<ul style="list-style-type: none"> » Develop transportation solutions that support federal, state, and regional natural resource agency programs. » Create transportation system solutions that meet all aesthetic, noise, air, and water quality standards. 	<ul style="list-style-type: none"> » Periodically evaluate environmental regulation compliance, evaluate compliance goals, and prioritize improvements needed. » Consult and collaborate with regulatory agencies to implement solutions.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
<p>1.4. Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.</p>	<ul style="list-style-type: none"> » Develop land use and transportation infrastructure that are coordinated and compatible to promote sustainable growth and mobility. » Implement sustainability and livability practices in existing and new transportation facilities. » Create transportation solutions that promote the balance of a strong diversified economy, a clean and aesthetic environment, and a healthy quality of life. » Encourage road users to reduce impact to the environment. » Promote the use of sustainable and renewable energy sources. Support solutions that will contribute towards achieving the State Clean Energy Goal. » Create transportation facilities that support an increase in energy efficiency. Create projects and programs and 'green' initiatives to promote more efficient use of energy. 	<ul style="list-style-type: none"> » Reserve and/or develop right-of-way width for build-out conditions of multimodal transportation facilities, and utilities. » Develop cost effective, clean, and green alternative materials used in infrastructure. » Use tax incentives and public acknowledgement as means to reward road users for using less fuel, producing less pollution, providing facilities for bicyclists and pedestrians. » Develop an evaluation tool for measuring sustainability over the life cycle of a transportation project or program. » Use integrated action plans from Department of Business, Economic Development, and Tourism's Lead by Example Energy Initiatives to support the Hawaii Clean Energy Initiative goal of 40 percent renewable energy by 2030. » Provide conveniently located and an adequate number of alternative energy fueling/recharging stations. » Pursue opportunities for developing underground utility corridors, and integrating them as separate pedestrian/bicycle paths.
<p>1.5. Promote long-term resiliency relative to hazards mitigation, namely global climate change, with considerations to reducing contributions to climate change from transportation facilities, and reducing the future impacts of climate change on the transportation system.</p>	<ul style="list-style-type: none"> » Acknowledge that climate change will impact portions of our existing transportation infrastructure and address the potential effect of sea level rise and extreme weather changes on Hawaii's transportation facilities. » Orient transportation planning to incorporate strategies for adapting to climate change, including; sea-level rise, extreme weather events, energy costs, and energy supply disruption. 	<ul style="list-style-type: none"> » Clearly identify shoreline areas affected by climate change and develop plan to preserve or relocate at-risk transportation facilities and avoid new construction in affected zones. Use climate change and sea-level rise data consistent with State of Hawaii current policy (which forecasts a 1-meter rise by the end of the 21st century).

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: Modal Integration		
<p>2.1. Provide a Complete Streets transportation system of motorized and nonmotorized options.</p>	<ul style="list-style-type: none"> » Create transportation facilities that support all modes of travel that result in a well-connected systemwide network for travel between transport modes and between communities. » Promote education and understanding of the benefits of bicycling and walking and laws applicable to each group. 	<ul style="list-style-type: none"> » Coordinate modal plans for motorized, pedestrian, bicycle, and transit modes so that uses of these interconnected systems complement each other. » Include specific training in drivers' education courses. » Include more questions about bicycle and pedestrian laws in the written driver's license exam. » Provide transit, bike ride, and walking opportunities for transportation professionals and decision-makers so they can better understand the concerns of transit riders, bicyclists, and pedestrians. » Support programs and agencies that provide bike/pedestrian safety educational materials and courses (emphasize outreach efforts on high-risk populations such as children and the elderly).
<p>2.2. Promote efficient travel between modes by creating connections and removing barriers.</p>	<ul style="list-style-type: none"> » Promote design and development of complete, integrated multimodal street systems for all users (including freight, motorists, pedestrians, bicycles, transit, etc.) of all ages and abilities. » Encourage transportation infrastructure and transportation service concurrency with land development. 	<ul style="list-style-type: none"> » Provide funding mechanisms and explore alternatives to implement multimodal facility development. » Improve agency coordination to provide practical, seamless, and safe facilities for connections between modes. » Design transportation solutions that address issues of distance, safety, and ease of access between bus stops, nonmotorized amenities, and land uses. Highlight transit and nonmotorized modes as affordable, attractive, simple, and desirable options for travel. » Promote development of park-and-ride stations at population centers, urban area perimeters, and bypass road intersections.
<p>2.3. Promote safe connections between modal alternatives.</p>	<ul style="list-style-type: none"> » Provide transportation modal options and connections that address safety considerations of all users, especially at-risk population segments (children, elderly, disabled). 	<ul style="list-style-type: none"> » Update street design standards to support best practices for pedestrian and bicycle facilities and safety. » Coordinate with agencies that support vulnerable populations to better understand concerns of transit riders, bicyclists, and pedestrians.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: System Preservation		
<p>3.1. Manage transportation assets and optimize investments.</p>	<p>» Plan and implement maintenance, resurfacing, rehabilitation, and reconstruction to optimize existing transportation system improvements and spending.</p>	<ul style="list-style-type: none"> » Maintain inventory of all transportation assets. Include information on current condition of assets. Maintain systems to monitor and evaluate infrastructure changes so they match regular planning investment cycles. » Identify variations in cost for periodic maintenance versus total replacement of facilities to help prioritize projects. Consider total lifecycle costs. » Improve use of technology to protect and preserve existing infrastructure. » Support a strong policy of size and weight enforcement, including innovative technologies to protect and preserve the existing infrastructure.
<p>3.2. Maintain safe, efficient, complete transportation system for the long term.</p>	<p>» Plan and implement existing system improvements to effectively sustain the overall transportation system's safe, efficient, and complete operations.</p>	<ul style="list-style-type: none"> » Maintain a schedule for maintenance, replacement, and reconstruction using asset inventory information. » Maintain and/or upgrade critical routes (i.e., routes serving as single access to communities with inadequate size/load capacity) and as key emergency evacuation and/or services corridors. » Maintain an aggressive preventative maintenance program to extend the useful life of current infrastructure. » Improve coordination of system preservation needs with other infrastructure projects and programs. » Include impacts related to hazards mitigation, including global climate change, in assessment of system preservation plans.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: Security		
<p>4.1. Plan, maintain, and operate a transportation system that supports evacuation, response and recovery for incidents.</p>	<ul style="list-style-type: none"> » Reduce travel time during incident responses. » Improve incident detection and response capabilities, including access and air and sea modal connections. » Improve coordination with emergency managers and major traffic generators and attractors during the planning and execution phases of an incident response. » Provide adequate facilities and capacity to support the needs of emergency and evacuation routes. » Improve flow of information to the traveling public 	<ul style="list-style-type: none"> » Promote and develop alternate route options for existing highways and freeways to allow efficient rerouting of traffic away from the primary incident location. » Identify and develop strategic evacuation routes that support the multihazard plans. » Maintain and upgrade key emergency and access routes (i.e., routes serving as single access to communities with inadequate size or load capacity). » Improve public transportation use for emergency evacuation of nonmobile residents during incidents. » Improve surveillance systems and upgrade detection equipment (such as cameras or loop sensors on roadways) to reduce incident detection time and response time. » Implement multiagency training programs so staff are well educated on protocols and procedures during incident response. Ensure appropriate agencies are involved and alerted to incidents in a timely manner. Ensure that program developers and trainers are qualified to develop appropriate procedures. » Develop a comprehensive outreach mechanism to inform agencies and traffic generators and attractors (e.g., service industries) about incidents. » Enhance multimedia tools to provide information to the traveling public (such as radio and internet information) and information regarding where they can access information (such as "in case of emergency tune to xxx" variable message signs)
<p>4.2. Improve resiliency of the state through the transportation system.</p>	<ul style="list-style-type: none"> » Plan and design for transportation system resilience to maintain efficient and effective connectivity for communities during recovery periods, including resiliency of the utility systems along transportation corridors. 	<ul style="list-style-type: none"> » Establish a forum with the emergency management community, utility providers, and transportation service and infrastructure users to evaluate the transportation system resiliency. » Prioritize roads that provide connectivity in rural areas of the state.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: Economic Vitality		
<p>5.1. Promote the expansion and diversification of Hawaii's economy through the efficient and effective use of transportation facilities including movement of people, goods, and services in a safe, energy efficient, and environmentally sound manner.</p>	<ul style="list-style-type: none"> » Maintain and develop an integrated, efficient, and reliable freight system by ensuring connectivity between air, land, and water (harbor) facilities. » Develop an integrated, efficient, and reliable multimodal transportation system that is resilient to impacts of rising oil/energy costs and that will meet future transport demands. » Develop an integrated multimodal system of transportation facilities, services, and information systems that provide for efficient commuter and local resident trips. » Develop an integrated multimodal system of transportation facilities, services, and information so that intrastate, interstate, and international travelers can travel easily for business and recreation. » Improve end-user benefits by reducing operating costs and reducing freight delays. » Maintain and operate an integrated transportation system that supports the economic vitality of all islands, especially locations that can be significantly impacted by small changes in the transportation system (such as Molokai and Lanai). 	<ul style="list-style-type: none"> » Identify and address capacity constrained areas within the transportation system. Prioritize the capacity projects when other strategies are not appropriate. » Consider transportation alternatives that support arrivals and departures of travelers at all hours of the day; and the communication needs of foreign travelers (multilanguage and universal signs). » Encourage and promote concurrent improvements in transportation infrastructure to mitigate impacts of all new developments and maintain an efficient transportation system that supports economic vitality. » Identify specific funding strategies to enhance economic vitality. » Explore financial strategies that examine fees (revenue sources) that cover all transportation modes. » Support efficient and effective movement along the transportation system with traveler information, such as signage and real-time multimedia announcements. » Coordinate schedules and routes of freight transport needs with other transportation system projects to minimize delay and support economic vitality.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: System Efficiency Management and Operations		
<p>6.1. Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.</p>	<ul style="list-style-type: none"> » Improve consistency and predictability of travel time along existing corridors. » Preserve the functional classification system hierarchical operating characteristics. 	<ul style="list-style-type: none"> » Promote transportation demand management and operations techniques, such as carpooling/vanpooling and staggered work hours. » Promote high-occupancy facilities to improve mobility within the existing infrastructure. » Promote Intelligent Transportation Systems (ITS) strategies and implement advanced traveler information devices to monitor traffic operations. Inform users of conditions, and identify locations where avoiding bottlenecks or geometric constraints can improve traffic flow, reduce delay, and improve reliability of the system. » Preserve the function of transportation facilities by implementing appropriate access management requirements based on the roadway's functional characteristics. » Develop connectivity between subdivisions and interior roadways to maintain mobility and function of arterials and major collectors. » Identify changes in demographics, transportation modes, and needs of users on a regular basis.
Federal Planning Factor: Transportation Access Mobility		
<p>7.1. Provide appropriate and reliable transportation access options statewide to all users.</p>	<ul style="list-style-type: none"> » Provide services and infrastructure to support modal alternatives for all demographics. 	<ul style="list-style-type: none"> » Coordinate between public and private transit and bus service providers to integrate programs, align investments, and provide affordable, streamlined services. » Coordinate multimodal infrastructure and transit service improvements with human service agencies to determine needs of underserved populations, such as disabled, elderly, and environmental justice (EJ) populations.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
<p>7.2. Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves EJ populations).</p>	<ul style="list-style-type: none"> » Prioritize projects equitably to serve all modes and demographics, with attention to underserved communities. 	<ul style="list-style-type: none"> » Provide constant and continuous information broadly to the public about expenditures on transportation infrastructure and services, and operations performance. » Create a monitoring system to evaluate transportation projects and programs against the goals and standards that they were originally developed to achieve. Develop strategies and tools to support corrective actions. » Promote transparent decision processes with broader citizen engagement and oversight. This can be accomplished by establishing sub-area groups, advisory boards, or committees comprised of a broad spectrum of representatives for all residents including underserved populations (such as disabled, elderly, and EJ). » Support paratransit programs that meet the needs of the disabled and elderly population.
Federal Planning Factor: Safety		
<p>8.1. Maintain a safe transportation system for all land transportation modes.</p>	<ul style="list-style-type: none"> » Address transportation safety through a mixture of education, enforcement, and engineering solutions. » Reduce the number traffic-related fatalities. » Reduce the number of collisions and crashes involving serious injuries and fatalities for all land transportation modes. 	<ul style="list-style-type: none"> » Coordinate with the Strategic Highway Safety Plan to implement plan recommendations and monitor performance, including: <ul style="list-style-type: none"> - Photo enforcement - Prioritization of nonmotorized needs - Improved signage - Increased design considerations for safety of all modes (including temporary traffic control plans) - ITS - Improved data reporting, assessment, and availability of information - Impaired driving, motorcycle/moped, pedestrian and bicycle educational programs prioritizing young, high-risk new operators - Increased bicycle and pedestrian educational programs - Improved civil and criminal fines or penalties for fatalities or serious injuries - Increased enforcement - Safe enforcement areas - Increased severity of sentencing for convicted repeat offenders thereby keeping them from operating a motor vehicle while in an impaired condition. » Develop solutions that reduce or prevent head-on collisions on existing infrastructure as well as new facilities.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
		<ul style="list-style-type: none"> » Develop improved access for emergency service to reduce response time and evacuation time. » Develop roadside features that enhance safety of the transportation system. » Promote legislation, enforcement and education to reduce the risk of distracted transportation system users (all modes). » Promote education and enforcement programs to reduce injury risk to pedestrians and passengers with disabilities. » Develop transportation solutions that recognize and uphold the goals and strategies of safety programs supported by FHWA and AASHTO.
8.2. Improve safety of the community through connectivity of the transportation infrastructure.	<ul style="list-style-type: none"> » Provide emergency access to all parts of the state, especially in locations with only one road in and out. 	<ul style="list-style-type: none"> » Consider using other roads including military access roads and plantation or cane haul roads as alternatives during an emergency especially in a weather-related emergency. Identify which agency or agencies would be responsible for implementation. (Agreements with individual land owners and agencies are needed.)
Federal Planning Factor: Additional Goals, Objectives, and Strategies		
9.1. Obtain sufficient and specific transportation funding	<ul style="list-style-type: none"> » Create and implement a funding mechanism that would cover the costs of providing a safe, efficient, sustainable transportation system into the future. » Obtain diverse funding and ensure that funding set aside for transportation is used only for transportation. » Coordinate and communicate with the Counties on future transit corridors 	<ul style="list-style-type: none"> » Supplement current transportation funding by identifying and securing diverse funding sources to support the multimodal transportation system, e.g., public and private partnerships. » Identify and implement user fees that equitably spreads the cost burden over all modes of transportation without impacting EJ populations. » Reduce the deficit in state transportation facilities with increased taxes specifically earmarked for Capital Improvements or Maintenance. » Support policy that requires new development/growth to fund their impacts on transportation facilities (impact fees).

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
9.2. Optimize project delivery.	<ul style="list-style-type: none"> » Improve coordination of plans and resources. » Improve efficiency of planning and delivery of projects. 	<ul style="list-style-type: none"> » Plan, develop, and maintain transportation infrastructure within programmed budget amounts. » From planning through operations, improve coordination and communication between multiple departments, public citizen groups, and agencies to address needs and resources efficiently. » Provide communications between multiple departments, public citizen groups, and agencies related to status of projects. » In areas where multiple state and/or federal agencies have authority, create a lead agency to manage overall project reducing delays, redundancies and inefficiencies. Develop procedures and protocol to monitor compliance, cooperation, communication and efficiency. » Utilize transportation funds efficiently, and maximize revenues.
9.3. Provide on-going planning to assess and address statewide needs.	<ul style="list-style-type: none"> » Monitor, evaluate and develop solutions, and adjust program goals on a continuing periodic coordinated basis. 	<ul style="list-style-type: none"> » Continue to implement the 3-C planning process (comprehensive, cooperative and continuing).
9.4. Coordinate use of public right-of-way with other public service providers.	<ul style="list-style-type: none"> » Continue the safe accommodation and installation of utility facilities within the right-of-way or easement along state highways and federal-aid county highways. 	<ul style="list-style-type: none"> » Coordinate with utility service providers to work together in establishing location, design, and methods for the possible accommodation and installation of utility facilities along state highways and federal aid county highways. Considerations should include, but not be limited to safety, future widening and site specific issues. » Coordinate and communicate transportation and utility planning efforts to enable development of a coordinated transportation and utility system.

2. Weight Goals and Planning Factors

Step 2. Weight the Goals and Planning Factors

The Plan uses the eight planning factors and 22 goals to help make decisions about how solutions could be prioritized. The objectives were not used in developing solutions, but could potentially serve as a basis for developing Plan performance measures. Performance measures will be discussed later in the plan development process.

The various planning factors and goals essentially serve as *criteria* to help prioritize potential solutions according to a wide spectrum of stakeholder values related to Hawaii's land transportation system and Hawaii's future. Weights were assigned to the planning factors and goals to reflect how important stakeholders think individual planning factors and goals are for achieving long-range planning success.

It is important to agree on a set of weights prior to developing solutions to create an objective process. The weights provide insight into the most important priorities for the district and reflect stakeholder values about the land transportation system.

Weighting the Goals

The 22 goals are weighted based on discussions from facilitated work sessions with the Hawaii Technical Advisory Committee (TAC). Using Stakeholder Advisory Committee (SAC) goal weightings as input, the Hawaii TAC assigned weights to the goals to reflect regional priorities. See Table 2.

The Hawaii TAC weights were used as input to prioritize potential solutions within each region; therefore, though the goals themselves remain the same for the statewide and regional plans, the weightings differ, reflecting the unique values of each regional community.

FIGURE 2
Goal Weighting Process



Work session participants assigned weights to the 22 goals on a scale of 100 (the total weightings must add up to 100). The individual input from all participants in the Hawaii TAC work session was averaged. The Hawaii TAC weights, along with the SAC goal weights, are shown in Table 2.

TABLE 2
Goal Priority Weighting

Goals	Goal Priority Weight	
	SAC	Hawaii TAC
Environment and Sustainability Goals		
1.1 Preserve and enhance the natural environment, including biological and aesthetic resources.	2.8%	3.0%
1.2 Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.	3.9%	3.0%
1.3 Meet the relevant environmental regulations and standards set by federal, state, and county/city agencies. Maintain collaborative working relationships with agencies and comply with goals of their relevant plans and policies.	4.2%	1.0%
1.4 Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	5.9%	3.0%
1.5 Promote long-term resiliency relative to hazards mitigation, namely global climate change, with considerations to reducing contributions to climate change from transportation facilities, and reducing the future impacts of climate change on the transportation system.	7.6%	5.0%
Modal Integration Goals		
2.1 Provide a Complete Streets transportation system of motorized and nonmotorized options.	8.1%	7.0%
2.2 Promote efficient travel between modes by creating connections and removing barriers.	7.1%	4.0%
2.3 Promote safe connections between modal alternatives.	5.0%	3.0%
System Preservation Goals		
3.1 Manage transportation assets and optimize investments.	2.8%	4.0%
3.2 Maintain a safe, efficient, complete transportation system for the long-term.	3.8%	7.0%
Security Goals		
4.1 Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.	5.4%	6.0%
4.2 Improve resiliency of the state through the transportation system.	2.9%	3.0%
Economic Vitality Goals		
5.1 Promote the expansion and diversification of Hawaii's economy through the efficient and effective use of transportation facilities including movement of people, goods, and services in a safe, energy efficient, and environmentally sound manner.	3.6%	8.0%
System Efficiency Management and Operations Goals		
6.1 Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.	4.8%	10.0%
Transportation Access Mobility Goals		
7.1 Provide appropriate and reliable transportation access options statewide to all users.	6.0%	4.0%
7.2 Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves EJ populations).	5.0%	4.0%
Safety Goals		
8.1 Maintain a safe transportation system for all land transportation modes.	7.1%	9.0%
8.2 Improve safety of the community through connectivity of the transportation infrastructure.	3.4%	5.0%
Additional Goals, Objectives and Strategies		
9.1 Obtain sufficient and specific transportation funding.	4.2%	5.0%

TABLE 2
Goal Priority Weighting

Goals	Goal Priority Weight	
	SAC	Hawaii TAC
9.2 Optimize project delivery.	1.7%	2.0%
9.3 Provide on-going planning to assess and address statewide needs.	1.9%	3.0%
9.4 Coordinate use of public right-of-way with other public service providers.	2.8%	1.0%
	100.0%	100.0%

Weighting the Planning Factors

The HDOT program managers assigned weights to each of the eight planning factors in a facilitated work session. This methodology provides a link between the HDOT programs and the long-range transportation goals of the HDOT Highways Division. Weights are based on staff's understanding of particular HDOT program needs and the future ability of the HDOT to fund those programs based on historical expenditures. These expenditures are derived from historical contracts (the Fiscal Year 2006-2009 contract awards) and estimated future spending is based on the Fiscal Year 2011-2014 Statewide Transportation Improvement Program projects.

Work session participants assigned weights to the eight factors and the additional category on a scale of 100 (the total weightings must add up to 100), as shown in Table 3. The input from all participants was averaged.

The planning factor priority weighting is consistent across all regional plans. Unlike the goal priority weighing, the planning factor weighting does not vary by region.

TABLE 3
Planning Factor Priority Weighting

Planning Factor	Priority Weight
Environment and Sustainability	4%
Modal Integration	7%
System Preservation	31%
Security	1%
Economic Vitality	17%
System Efficiency Management and Operations	18%
Transportation Access Mobility	2%
Safety	19%
Additional Goals	1%
TOTAL	100%

3. Develop Solutions**Step 3. Develop Solutions**

After understanding the issues and transportation needs on the federal-aid highway system in the District of Hawaii, potential solutions were developed for each of the identified problem areas. Potential solutions were based on:

- Plan, policy, and program reviews to allow the team to build upon previously identified solutions
- Future forecasted travel demands to help guide appropriate capacity solutions
- Stakeholder input to reflect the knowledge of all groups represented, and to guide the development of non-capacity solutions.

To generate a diverse range of potential solutions, the stakeholders worked in facilitated groups to mark up maps of Hawaii and identify locations of potential solutions. This interactive format encouraged stakeholders to weigh the benefits of particular solutions on their island environment, and resulted in a comprehensive preliminary list of potential solutions for the District of Hawaii.

4. Pass/Fail Evaluation**Step 4. Apply Tier 1 Pass/Fail Evaluation to the Solutions**

The list of potential solutions resulting from Step 3 was anticipated to be large. Step 4 is intended to cull the list of solutions to prevent wasted effort for solutions unlikely to be pursued because they are inconsistent with Plan goals and/or the HDOT mission. Therefore, potential solutions were evaluated against a set of six high-level Tier 1 pass/fail criteria. These Tier 1 pass/fail criteria are consistent with the goals and objectives of the Plan, and are intended to narrow the list of potential solutions to a set of manageable options.

The project management team (PMT) performed the Tier 1 evaluation after solutions were developed. If a solution failed **any** of the criteria, it was not advanced forward to the Tier 2 evaluation process. The results were shared with stakeholder groups for validation. The Tier 1 evaluation worksheet is shown in Table 4.

TABLE 4.
Tier 1 Pass/Fail Criteria

Criteria	Pass/Fail
Tier 1 Evaluation Matrix – Pass/Fail	
<p>HDOT Highways Mission: Is the solution in alignment with the Hawaii Department of Transportation Highways Division mission?</p> <p>The mission of the Highways Division is to provide a safe, and efficient and accessible highway system through the utilization of available resources in the maintenance, enhancement, and support of land transportation facilities.</p>	
<p>Plan Goals: Does the solution support one or more of the plan goals as described in the Final Goals, Objectives, and Strategies Memorandum dated November 29, 2012 for the Statewide Federal-Aid Highways 2035 Transportation Plan or the Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai?</p>	
<p>Jurisdiction/Significance: Is the solution within the physical and/or operational jurisdiction of the federal-aid highways network or a regionally significant transportation project that is integral to the transportation system as defined by adopted statewide and regional plans?</p>	
<p>Completeness: Is the solution complete? Does it account for all necessary investments or actions to ensure the realization of the solution's objective?</p>	
<p>Acceptable: Is the solution implementable and acceptable in terms of applicable laws, regulations, and public policies?</p>	
<p>Redundant: Is the need/deficiency already being addressed independent of this planning process?</p>	

Potential solutions that passed the Tier 1 evaluation and were advanced to Tier 2 evaluation are shown in Attachment 1.

**5. Evaluate
Remaining Solutions**

Step 5. Apply Tier 2 Evaluation to Remaining Solutions and Assign Grades

The Tier 2 evaluation is intended to assess remaining solutions in relation to the plan goals (the same goals weighted in Step 2). Evaluation criteria were developed for each plan goal in order to provide a measurable comparative assessment of solutions. For each goal, each solution was given a grade between -2 and +2.

This grade shows how well a potential solution meets or addresses a specific Plan goal. The grades are also intended to show the advantages and disadvantages of the solutions in relation to each other. The grades will provide a means of seeing tradeoffs among the solutions, thereby making the comparative function of the grades more important than the grades themselves.

The Tier 2 evaluation criteria grades are as follows:

- 2, -1** The solution is contrary to the Plan goal
- 0** The solution is not directly related or does not impact the Plan goal
- 1, 2** The solution supports realization of the Plan goal

The PMT applied the Tier 2 evaluation to all solutions. The results were shared with stakeholders for validation. Table 5 shows each of the Plan goals, the evaluation criteria, and the grading scale to show how scores were assigned.

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
Environment and Sustainability			
<p>Goal 1.1: Preserve and enhance the natural environment, including biological and aesthetic resources.</p>	<p>-2: Solution does not meet any of the five evaluation criteria related the natural environment</p> <p>-1: Solution meets one of the five evaluation criteria related the natural environment</p> <p>0: Solution meets two of the five evaluation criteria related the natural environment</p> <p>1: Solution meets three of the five evaluation criteria related the natural environment</p> <p>2: Solution meets at least four of five evaluation criteria related the natural environment</p>	<p>Source: Department of Business, Economic Development, and Tourism GIS – Natural Resource/Environmental Layers and Physical Features Layers http://www.state.hi.us/dbedt/gis/download.htm</p> <p>Source: Hawaii Scenic Byways Program – Program Objectives</p> <ol style="list-style-type: none"> 1. Does the solution not directly impact, or does the solution provide net benefits to, prime agricultural lands (based on State Land Use Commission – Land Use District Boundary maps)? 2. Does the solution not directly impact, or does the solution provide net benefits to wetland habitats (based on the State of Hawaii GIS layers for Wetlands)? 3. Does the solution not directly impact, or does the solution provide net benefits to streams (based on the State of Hawaii GIS layers for Streams)? 4. Does the solution not directly impact, or does the solution provide net benefits to, critical habitats or known areas of threatened and endangered species (based on US Fish and Wildlife Service GIS data for critical habitats)? 5. Does the solution meet at least one of the following objectives of the Hawaii Scenic Byways Program? <ol style="list-style-type: none"> a) Preserve, enhance, and protect the beauty of our natural, cultivated, and built landscapes and their relationship to our history, our culture, and our future. b) Promote understanding of Hawaii’s heritage and an appreciation of our diversity. c) Encourage land uses that create and complement scenic vistas and panoramas. d) Create and improve relationships among the architectural, technological, and engineering elements of transportation facilities and associated structures visible in the travel corridor. e) Improve traffic flow along main routes and promote pedestrian, bicycle, and paratransit travel in ways that contribute to conserving energy resources and improving air quality. 	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
<p>Goal 1.2: Preserve and enhance Hawaii’s cultural resources and environment, including archaeological and historical sites.</p>	<p>-2: Direct impact to archaeological or cultural resources (that cannot be mitigated)</p> <p>-1: Potential impacts to archaeological or cultural resources (that cannot be mitigated)</p> <p>0: No impacts/enhancements to archaeological or cultural resources</p> <p>1: Potential enhancements to existing archaeological or cultural resources</p> <p>2: Enhances existing archaeological or cultural resources</p>	<p>Source: State Historic Preservation Division (SHPD) - Hawaii Register of Historic Places</p> <p>http://hawaii.gov/dlnr/hpd/</p> <p>Does the potential solution affect any place listed on the National and State Register of Historic Places for Hawaii?</p>	
<p>Goal 1.3: Meet the relevant environmental regulations and standards set by federal, state and county/city agencies. Maintain collaborative working relationships with agencies and comply with goals of their relevant plans and policies.</p>	<p>-2: Does not meet any of the three evaluation criteria related to environmental regulations and standards</p> <p>-1: -</p> <p>0: Meets at least one of the three evaluation criteria related to environmental regulations and standards</p> <p>1: -</p> <p>2: Meets all three of the relevant evaluation criteria related to environmental regulations and standards</p>	<p>Source: United States Environmental Protection Agency http://www.epa.gov/aboutepa/whatwedo.html</p> <p>Source: Hawaii Department of Health (Office of Environmental Quality Control) http://hawaii.gov/health/environmental/oeqc/index.html</p> <p>Source: Hawaii Statewide Transportation Plan</p> <ol style="list-style-type: none"> 1. Is the solution aligned with the mission and the purpose of the United States Environmental Protection Agency? Specifically, does the solution protect human health and the environment through reduction of environmental risk and support of diverse, sustainable, and economically productive communities and ecosystems? 2. Does the potential solution support the purpose of the Office of Environmental Quality Control to maintain the optimum quality of the state’s environment through coordinated efforts by state agencies? 3. Does the solution meet Goal IV of the Hawaii Statewide Transportation Plan (to protect Hawaii’s unique environment quality of life and mitigate any negative impacts)? 	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
<p>Goal #1.4: Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.</p>	<p>-2: Solution does not meet any of the five evaluation criteria related to sustainable practices</p> <p>-1: Solution meets one of the five evaluation criteria related to sustainable practices</p> <p>0: Solution meets two of the five evaluation criteria related to sustainable practices</p> <p>1: Solution meets three of the five evaluation criteria related to sustainable practices</p> <p>2: Solution meets at least four of five evaluation criteria related to sustainable practices</p>	<p>Source: Hawaii 2050 Sustainability Plan http://www.hawaii2050.org/index.php/site/sp_goals</p> <p>Is the solution aligned with goals and strategic actions of the Hawaii 2050 Sustainability Plan? Specifically, is the solution expected to:</p> <ol style="list-style-type: none"> 1. Improve energy efficiencies and options in transportation? 2. Increase access to public transportation? 3. Reduce traffic congestion? 4. Encourage and provide incentives for telecommuting? 5. Increase and improve bicycle and pedestrian facilities, including multiuse pathways? 	
<p>Goal #1.5: Promote long-term resiliency relative to all hazards mitigation, including global climate change, with considerations to reducing contributions to climate change from transportation facilities, and reducing the future impacts of climate change on the transportation system.</p>	<p>-2: Does not meet either evaluation criteria related to potential climate change or energy efficiency.</p> <p>-1:</p> <p>0: Meets one of the evaluation criteria related to potential climate change or energy efficiency.</p> <p>1:</p> <p>2: Meets both evaluation criteria related to potential climate change and energy efficiency.</p>	<p>Source: Hawaii Clean Energy Initiative (HCEI) http://www.hawaii-cleanenergyinitiative.org/</p> <p>Source: Regional travel demand model travel times</p> <p>Source: Hawaii Statewide Transportation Plan</p> <ol style="list-style-type: none"> 1. Does the solution support the Transportation sector goal of the HCEI to reduce consumption of petroleum in ground transportation by 70% by 2030? Specifically, does the solution improve energy/fuel efficiency of vehicles by reducing vehicle travel times? 2. Does the solution meet Objective 7 of Goal IV of the Hawaii Statewide Transportation Plan (to encourage adaptation to the effects of global climate change and build resilience in the transportation system, and to address the potential effect of a one meter sea-level rise and extreme weather changes by the end of the 21st century on Hawaii's air, land and water transportation facilities)? Specifically, does the solution meet the appropriate shoreline development setback distance for each region to minimize damage from coastal hazards due to sea-level rise? ¹ 	

¹ Maps depicting a one-meter rise in sea level are not currently available for all regions. Alternate measurable criteria will be used to develop the Statewide and Regional Long-Range Land Transportation Plans for the Islands of Maui/Molokai/Lanai, Hawaii and Kauai (2035). One-meter sea level rise contour maps may be used for subsequent long-range plan evaluations.

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
Modal Integration			
<p>Goal 2.1: Provide a Complete Streets transportation system of motorized and nonmotorized options.</p>	<p>-2: Does not support the two Complete Streets principles listed under the Evaluation Criteria</p> <p>-1: -</p> <p>0: No impacts to the multimodal transportation system</p> <p>1: -</p> <p>2: Aligns with the two Complete Streets principles listed under the Evaluation Criteria</p>	<p>Source: Hawaii Complete Streets – Final Complete Streets Legislative Report (November 2010)</p> <p>Does the solution support the following principles listed in the final Complete Streets legislative report?</p> <ol style="list-style-type: none"> 1. Accessibility and mobility for all – Plan and design transportation facilities for ease of use and access to destinations by providing an appropriate path of travel for all users, and enhance the ability to move people and goods throughout the state and its counties. 2. Use and comfort of all users – Ensure all users of all abilities, including bicyclists, pedestrians, transit riders, and drivers, feel comfortable and safe using the transportation system. 	
<p>Goal 2.2: Promote efficient travel between modes by creating connections and removing barriers.</p>	<p>-2: Creates barriers to multimodal connection opportunities</p> <p>-1: No multimodal connection opportunities</p> <p>0: No impacts to multimodal system</p> <p>1: Provides multimodal connection opportunities</p> <p>2: Provides multimodal connection opportunities between multiple modes of travel</p>	<p>Source: Hawaii Statewide Pedestrian Master Plan – Existing Bus Route maps (Maps K-2, M-2, H-3)</p> <p>Source: HDOT Highway Performance Monitoring System (HPMS) (2009)</p> <p>Does the solution improve existing connections to and between vehicles, transit, and nonmotorized modes?</p>	
<p>Goal 2.3: Promote safe connections between modal alternatives.</p>	<p>-2: Does not support the Complete Streets principle listed under the Evaluation Criteria</p> <p>-1: -</p> <p>0: No impacts to the multimodal transportation system</p> <p>1: -</p> <p>2: Aligns with the Complete Streets principle listed under the Evaluation Criteria</p>	<p>Source: Hawaii Complete Streets – Final Complete Streets Legislative Report (November 2010)</p> <p>Does the solution support the following principle listed in the final Complete Streets legislative report?</p> <p>Safety – Plan, design, and construct transportation facilities and land developments to create an environment that reduces risk and supports the safe movement of people and goods by all modes.</p>	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
System Preservation			
<p>Goal 3.1: Manage transportation assets and optimize investments.</p>	<p>-2: Solution causes adverse impacts to transportation assets (pavement, bridge, or structure) by minimizing life-cycle costs</p> <p>-1:</p> <p>0: Solution is not applicable to either of the two Evaluation Criteria, or existing asset (pavement, bridge, or structure) data are insufficient</p> <p>1:</p> <p>2: Solution meets either of the two Evaluation Criteria</p>	<p>Source: HDOT State Route System – Road Inventory Line Diagrams</p> <p>Source: HDOT Bridge Program – 10 Year Plan Rehabilitation and Replacement Schedule</p> <p>Source: HDOT HPMS</p> <ol style="list-style-type: none"> 1. For roadway pavement improvements, does the solution optimize life-cycle costs of the existing transportation asset? Specifically, assuming a 20-year typical life span for asphalt concrete-paved roadways and other pavement permutations in Hawaii, is the potential solution expected to be implemented at least 15 years <i>after</i> its most recent pavement improvement (construction completion, rehabilitation, or resurfacing), or does the solution address a documented need for short-term maintenance (within 15 years of its most recent pavement improvement)? 2. For bridge or structure improvements, does the solution align with or support identified/scheduled existing asset improvement needs? Specifically, does the potential solution coincide with documented rehabilitation or replacement activities in the current "Bridge Program - 10 Year Plan" database? 	
<p>Goal 3.2: Maintain a safe, efficient, complete transportation system for the long-term.</p>	<p>-2: Solution causes adverse impacts to transportation assets by reducing useful life of facility</p> <p>-1:</p> <p>0: No impacts to maintaining the existing transportation system or solution is not applicable to either of the two Evaluation Criteria</p> <p>1: Solution meets one of the two Evaluation Criteria</p> <p>2: Solution meets both Evaluation Criteria</p>	<p>Source: FHWA Pavement Preservation Definitions (2005) http://www.fhwa.dot.gov/pavement/preservation/091205.cfm</p> <p>Source: FHWA Bridge Preservation Guide (2011) http://www.fhwa.dot.gov/bridge/preservation/guide/index.cfm</p> <p>Source: HDOT Bridge Program – 10 Year Plan Rehabilitation and Replacement Schedule</p> <ol style="list-style-type: none"> 1. Does the solution support long-term operation of the existing transportation system through preventive maintenance (defined by FHWA as a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system without substantially increasing structural capacity)? Specifically, does the solution involve any of the following preventive maintenance strategies: <ol style="list-style-type: none"> a) Washing or cleaning of bridge/pavement? b) Sealing asphalt cracks or concrete joints? 	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
		<ul style="list-style-type: none"> c) Overlaying thin layers of asphalt? d) Facilitating or improving drainage? e) Removing debris? f) Maintaining adjacent vegetation and landscaping? <p>2. Does the solution support continuity of the existing transportation system through preservation of critical routes? Specifically, will the solution extend the life of a transportation facility that:</p> <ul style="list-style-type: none"> a) Serves as the single access to a community or area? b) Is a key emergency evacuation route or emergency service corridor? 	
Security			
<p>Goal 4.1: Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.</p>	<ul style="list-style-type: none"> -2: Removes critical facilities and lifelines necessary for incident evacuation, response and recovery -1: Reduces capabilities of critical facilities and lifelines necessary for incident evacuation, response and recovery 0: No impact to critical facilities and lifelines necessary for incident evacuation, response and recovery 1: Improves capability of critical facilities and lifelines for incident evacuation, response and recovery 2: Provides additional usable or alternate critical facilities and lifelines for incident evacuation, response and recovery 	<p>Hawaii State Civil Defense – 2010 Hazard Mitigation Plan http://www.scd.hawaii.gov/2010_hmp.html (refers to individual island multihazard plans)</p> <p>Source: Kauai Multi-Hazard Mitigation Strategy</p> <p>Is the solution aligned with the relevant goals of the plan, specifically, does the solution secure and maintain lifelines and access for medical assistance and transport of materials/fuel during hazard events?</p> <p>Source: Hawaii County Multi-Hazard Mitigation Plan</p> <p>Is the solution aligned with the relevant goals of the plan, specifically, does the solution control future development and support retrofitting existing structures within hazard areas? Does the solution allow or encourage all emergency response critical facilities and communication systems to remain operational during hazard events?</p> <p>Source: Maui County Multi-Hazard Mitigation Plan</p> <p>Is the solution aligned with the relevant goals of the plan, specifically, does the solution support reduction of property damage caused by hazard events? Does it encourage the ongoing operations of critical facilities during and after an event?</p>	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
<p>Goal 4.2: Improve resiliency of the state through the transportation system.</p>	<p>-2: Not in alignment with preparedness plans, and does not support transportation infrastructure and facilities vital to recovery</p> <p>-1:</p> <p>0: No impact to supporting resiliency of the State during recovery periods</p> <p>1:</p> <p>2: Supports preparedness plans, and protects transportation infrastructure and facilities vital to recovery</p>	<p>Hawaii State Civil Defense – 2010 Hazard Mitigation Plan http://www.scd.hawaii.gov/2010_hmp.html (refers to individual island multihazard plans)</p> <p>Source: Kauai Multi-Hazard Mitigation Strategy</p> <p>Is the solution aligned with the relevant goals of the plan, specifically, does the solution secure and maintain lifelines and access for medical assistance and transport of materials/fuel during hazard events?</p> <p>Source: Hawaii County Multi-Hazard Mitigation Plan</p> <p>Is the solution aligned with the relevant goals of the plan, specifically, does the solution ensure that all lifeline infrastructures are able to withstand hazard events?</p> <p>Source: Maui County Multi-Hazard Mitigation Plan</p> <p>Is the solution aligned with the relevant goals of the plan, specifically, does the solution protect the ongoing operations of critical facilities during an event?</p>	
Economic Vitality			
<p>Goal 5.1: Promote expanding and diversifying Hawaii’s economy through the efficient and effective use of transportation facilities including movement of people, goods, and services in a safe, energy efficient, and environmentally sound manner.</p>	<p>-2: Decreases ability to move people and products effectively (screenline v/c increases by more than 10%)</p> <p>-1: Decreases ability to move people and products effectively (screenline v/c increases by 10% or less)</p> <p>0: No impact to movement of people and products</p> <p>1: Increases ability to move people and products effectively (screenline v/c decreases by 10% or less)</p> <p>2: Increases ability to move people and products effectively (screenline v/c decreases by more than 10%)</p>	<p>Source: Regional travel demand model volume-to-capacity (V/C) ratios at project screenline locations.</p> <p>Does the solution increase or decrease the ability to effectively move people and goods?</p>	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
System Efficiency Management and Operations			
<p>Goal 6.1: Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.</p>	<p>-2: Does not support the Evaluation Criteria related to access management policies for existing state roadways</p> <p>-1: No impact to the existing transportation system</p> <p>0: Supports one of the three Evaluation Criteria related to access management policies for existing state roadways</p> <p>1: Supports two of the three Evaluation Criteria related to access management policies for existing state roadways</p> <p>2: Supports all three of the Evaluation Criteria related to access management policies for existing state roadways</p>	<p>Source: Access Management Manual (Transportation Research Board)</p> <p>Does the solution provide access (or remove access) consistent with access management policies, specifically does it:</p> <ol style="list-style-type: none"> 1. Promote a safe and efficient transportation system? 2. Support and encourage traffic operations at the level intended by its functional classification? 3. Align with approved transportation plans and access design standards? 	
Transportation Access Mobility			
<p>Goal 7.1: Provide appropriate and reliable transportation access options statewide to all users.</p>	<p>-2: Removes service and/or infrastructure to support access to all modal alternatives (transit, pedestrian, bicycle)</p> <p>-1: Restricts services and/or infrastructure that support access to all modal alternatives (transit, pedestrian, bicycle) for all users</p> <p>0: No impacts to the existing land transportation system multimodal access options</p> <p>1: Improves existing service and/or infrastructure to support access to all modal alternatives (transit, pedestrian, bicycle)</p> <p>2: Provides service and/or infrastructure to support access to all modal alternatives (transit, pedestrian, bicycle) in areas that currently do not have modal options</p>	<p>Source: Hawaii Statewide Pedestrian Master Plan – Existing Bus Route maps (Maps K-2, M-2, H-3)</p> <p>Source: Bike Plan Hawaii – Regional maps</p> <p>Does the solution improve existing transportation access options or provide transportation access options to new geographic areas?</p>	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
<p>Goal 7.2: Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves EJ populations).</p>	<p>-2: Investments do not support infrastructure and access to modal alternatives (transit, pedestrian, bicycle) and do not consider underserved populations</p> <p>-1: -</p> <p>0: Not applicable</p> <p>1: -</p> <p>2: Investments support infrastructure and access to modal alternatives (transit, pedestrian, bicycle) with consideration to underserved populations</p>	<p>Source: American Community Survey (5-year estimates) maps showing percentage of population (by census tract) below poverty level.</p> <p>Source: Hawaii Statewide Pedestrian Master Plan – Existing Bus Route maps (Maps K-2, M-2, H-3)</p> <p>Source: HDOT Guide for Public Involvement (yes/no)</p> <p>Does the solution improve multimodal service to EJ populations?</p> <p>Does the public involvement plan support the formation of subarea groups, task forces, or advisory committees comprised of all populations, with special attention on committees/input from underserved populations?</p>	
Safety			
<p>Goal 8.1: Maintain a safe transportation system for all land transportation modes.</p>	<p>-2: Does not support the Complete Streets principle nor the HSHSP strategic actions listed under the Evaluation Criteria</p> <p>-1: -</p> <p>0: Supports either the Complete Streets principle or any of the HSHSP strategic actions listed under the Evaluation Criteria</p> <p>1: -</p> <p>2: Supports both the Complete Streets principle and any of the HSHSP strategic actions listed under the Evaluation Criteria</p>	<p>Source: Hawaii Complete Streets – Final Complete Streets Legislative Report (November 2010)</p> <p>Does the solution support the following principle listed in the final Complete Streets legislative report?</p> <p style="padding-left: 40px;">Safety – Plan, design, and construct transportation facilities and land developments to create an environment that reduces risk and supports the safe movement of people and goods by all modes.</p> <p>Source: Hawaii Strategic Highway Safety Plan</p> <p>Is the solution aligned with and does it support the strategic actions of the HSHSP? Emphasis areas include curbing aggressive driving, combating impaired driving, protecting vehicle occupants, safeguarding pedestrians and bicyclists, ensuring motorcycle and moped safety, building safer roads by design, and improving data and safety management systems. Strategic actions of these emphasis areas include:</p> <ol style="list-style-type: none"> 1. Does the solution support implementation of Intelligent Transportation System technologies, such as synchronization of traffic signals? 2. Does the solution support the installation of milled rumble strips at roadway centerlines and shoulders? 3. Does the solution support nonmotorized modes of travel and increase their visibility through lighting, signage and advanced technology at intersections? 	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
		4. Does the solution include medians or other physical barriers to separate directional traffic to reduce or minimize the number of potential conflicts between vehicles? 5. Does the solution remove or relocate fixed objects, steep grades, or ditches from critical locations?	
Goal 8.2: Improve safety of the community through connectivity of the transportation infrastructure.	-2: Restricts existing access for emergency response vehicles and nonmotorized modes -1: - 0: No impacts to emergency access 1: - 2: Improves existing connectivity and/or provides a second access for emergency response vehicles and nonmotorized modes	Source: HDOT HPMS (2009) Does the solution improve existing access or increase access to areas that currently have very few access options?	
Additional Goals			
Goal 9.1: Obtain sufficient and specific transportation funding.	-2: -Not eligible for available federal or state funding. -1: - 0: Eligible for available federal or state funding. 1: - 2: Able to be supplemented with diverse (or alternative) funding sources.		
Goal 9.2: Optimize project delivery.	-2: - -1: - 0: Not applicable 1: - 2:	Not applicable for solution evaluation.	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
<p>Goal 9.3: Provide ongoing planning to assess and address statewide needs.</p>	<p>-2: - -1: - 0: Not applicable 1: - 2: Supports the statewide planning process</p>		
<p>Goal 9.4: Coordinate use of public right-of-way with other public service providers.</p>	<p>-2: Does not allow for right-of-way use coordination for programmed utility agency infrastructure. -1: - 0: Not applicable 1: - 2: Allows for right-of-way use coordination for programmed utility agency infrastructure.</p>		

6. Calculate Ratings

Step 6. Calculate Ratings

Once the evaluation grades for each goal were assigned, they were entered into a calculation worksheet and multiplied by the planning factor weight and the goal weight developed in Step 2. For each solution for each goal the following formula calculates the Goal Rating:

$$(\text{Goal Priority Weight} \times \text{Planning Factor Weight}) \times \text{Evaluation Grade} = \text{Goal Rating}$$

Table 6 shows the calculation worksheet.

TABLE 6
Calculation Sheet

1. Environment and Sustainability		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
1.1	Preserve and enhance the natural environment, including biological and aesthetic resources.				0.000
1.2	Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.				0.000
1.3	Meet the relevant environmental regulations and standards set by federal, state and county/city agencies. Maintain collaborative working relationships with agencies and comply with goals of their relevant plans and policies.				0.000
1.4	Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.				0.000
1.5	Promote long-term resiliency relative to all hazards mitigation, including global climate change, with considerations to reducing contributions to climate change from transportation facilities, and reducing the future impacts of climate change on the transportation system.				0.000
2. Modal Integration		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
2.1	Provide a Complete Streets transportation system of motorized and non-motorized options.				0.000
2.2	Promote efficient travel between modes by creating connections and removing barriers.				0.000
2.3	Promote safe connections between modal alternatives.				0.000
3. System Preservation		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
3.1	Manage transportation assets and optimize investments.				0.000
3.2	Maintain a safe, efficient, complete transportation system for the long-term.				0.000
4. Security		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
4.1	Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.				0.000
4.2	Improve resiliency of the state through the transportation system.				0.000
5. Economic Vitality		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
5.1	Promote expanding and diversifying Hawaii's economy through the efficient and effective use of transportation facilities including movement of people, goods, and services in a safe, energy efficient, and environmentally sound manner.				0.000
6. System Efficiency Management and Operations		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
6.1	Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.				0.000
7. Transportation Access Mobility		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
7.1	Provide appropriate and reliable transportation access options statewide to all users.				0.000
7.2	Ensure transportation investments in programs and prioritization processes are balanced (across modes and demographics, i.e. serves environmental justice (EJ) populations).				0.000
8. Safety		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
8.1	Maintain a safe transportation system for all land transportation modes.				0.000
8.2	Improve safety of the community through connectivity of the transportation infrastructure.				0.000
9. Additional Goals, Objectives and Strategies		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
9.1	Obtain sufficient and specific transportation funding.				0.000
9.2	Optimize project delivery.				0.000
9.3	Provide on-going planning to assess and address statewide needs.				0.000
9.4	Coordinate use of public right-of-way with other public service providers.				0.000
		100%	100%	Total Solution Rating =	0.000

When ratings were calculated, they were summed for each solution. This resulted in a total solution rating, which can be compared to other total solution ratings for other potential solutions in the District of Hawaii.

Sum of Goal Ratings = Total Solution Rating

The total solution ratings show how each solution scores compared to the other solutions within the same region; but the process also shows the strengths and weaknesses of each solution in terms of the goals (for example, which solutions perform best in terms of safety, which perform best in terms of economic vitality, etc.).

It is important to remember that the evaluation process is a **TOOL** for decision-making and planning; the solutions should not be ranked or prioritized based on the total solution rating score alone.

7. Prioritize Solutions

Step 7. Prioritize the Solutions

Following the assignment of ratings, the PMT developed planning level cost estimates for each of the potential solutions. Estimated planning level costs are important variables for each solution because they allow the solution to be evaluated against fiscal constraints.

The total solution ratings, in conjunction with cost information, was used to identify potential solutions that consistently met the Plans priority goals and best addressed the regions deficiencies. Solutions with relatively high scores, compared to other solutions within the District of Hawaii, could indicate the solution meets the regions priority goals for land transportation. Lower ranking solutions could indicate that the solution does not meet the priority goals for the Plan, or does not meet an identified regional need or deficiency.

Potential solutions that scored relatively high were not definitively ranked or determined to be specific recommendations for the Plan. Rather, the potential solutions will be prioritized and implemented through a series of overarching HDOT Highways Division programs. These existing programs provide, manage, and maintain infrastructure and services on the District of Hawaii's federal-aid roadways. The overarching programs and their subprograms are described in Table 7.

Potential solutions for the District of Hawaii that address priority goals of the Plan, and their correlation to the implementing HDOT Highways Division programs, are described below:

- **Capacity projects** – Improving efficiency on the District of Hawaii's roadways was identified as a priority need. Capacity solutions to address efficiency needs include additional lanes on existing roads, new roads to increase travel options, adding new bicycle lanes or sidewalks to roads, and improving existing multimodal facilities. The existing *Capacity Program* is capable of implementing these types of solutions. Addressing capacity needs and congestion aligns with the Environment and Sustainability, System Preservation, Economic Vitality, and System Efficiency Management and Operations goals of the Plan.
- **Safety projects** – Solutions include both infrastructure and non-infrastructure projects that would benefit both vehicular and nonmotorized modes. Infrastructure projects include installing lighting, guardrails, or truck runaway ramps, and addressing pedestrian and bicycle needs. Potential solutions also include maintaining the integrity of embankments,

slopes, and retaining walls. Non-infrastructure projects include investigating lower speed limits and campaigns to communicate safety-related education. The existing *Safety Program* includes subprograms that are responsible for these types of improvements. Improving the safety of Hawaii's roadway infrastructure aligns with the Environment and Sustainability, Safety, and System Efficiency Management and Operations goals of the Plan.

- **System preservation and maintenance projects** – Potential solutions for highway maintenance and continuous highway operations fall under the existing *System Preservation Program*. Solutions include regular maintenance such as pavement resurfacing, rehabilitation, or reconstruction; bridge replacement or rehabilitation; seismic retrofit; guardrail repairs; sidewalk repairs; and removing and clearing roadside vegetation and debris. Erosion control, drainage improvements, and embankment maintenance are also implemented by the *System Preservation Program*. Maintaining the region's highways aligns with the System Preservation, Security, Safety, and System Efficiency Management and Operations goals of the Plan.
- **Modal integration projects** – Potential modal integration projects include improved roads with new bicycle lanes, new shared paths exclusively meant for nonmotorized modes, safer connections and increased visibility for nonmotorized modes, and improving access to transit from bicycle lanes or pedestrians trails. The existing *Safety Program*, *System Preservation Program*, and *Capacity Program* include subprograms that implement these types of priority multimodal projects. Providing mode choices for all users aligns with the Environment and Sustainability, Modal Integration, Safety, Transportation Access Mobility, and System Preservation goals of the Plan.
- **Security and resiliency projects** – Security projects improve Hawaii's resiliency to threats and emergencies, and support response or evacuation during natural disasters. Improving existing critical facilities and maintaining the condition of access roadways for potentially vulnerable communities is especially important to the District of Hawaii because of limited availability of parallel or alternate routes. The *Capacity Program*, *Safety Program*, and *System Preservation Program* prioritize and implement security and resiliency solutions. Providing reliable travel options aligns with the System Preservation, Safety, and Security goals of the Plan.
- **Transit projects** – Transit solutions include expanded service to rural areas, additional or more frequent routes, and better integration with bicycle routes and pedestrian paths. Transit infrastructure projects include bus stop amenities, wayfinding signage, and improved connections to transit stops from residential and commercial areas. Transit is implemented by the county, but the *Capacity Program* and *System Preservation Program* provide complementary benefits. System preservation and capacity projects can reduce transit travel time and help maintain transit schedules. Improving transit service and reliability for all users aligns with the Modal Integration and Transportation Access Mobility goals of the Plan.

Future Planning and Budgeting

This evaluation process is intended to be replicable. Since information, political priorities, funding sources, and state, regional, and local leadership change, it is important that this process is flexible. Goals, weights, and grading schemes could change over time – but the seven-step process is a defensible solution-prioritization process that can be applied to future planning cycles.

TABLE 7
HDOT Highways Division Program Summary and Correlation to Planning Factors

Program/Subprogram	Purpose	Correlation to Planning Factors Primary (Secondary) Factors Addressed by program
Safety Programs		
Highway Safety Improvement Program (HSIP)	<p>The Highway Safety Improvement Program (HSIP) is a component program of the FHWA Federal-Aid Program. It provides improvements in areas characterized with high accident occurrences. This program also funds grants for safety-related education and public outreach programs. The goal of the Program is to reduce the number of fatal and serious injury accidents. There are four main components:</p> <ul style="list-style-type: none"> • HSIP Core Program includes the planning/data collection, analysis, implementation and evaluation of projects to address high accident locations • High-Risk Rural Roads Program has a similar process to the Core Program, with a focus on fatal and serious injury accidents on rural roads with classifications of collector or lower. • Highway-Rail Safety Program requests that funds are transferred to the Core Program due to the rarity of serious train-related accidents in Hawaii. • Non-Infrastructure Flex Account allows up to 10% of the annual HSIP Core Program to fund non-infrastructure projects identified in the Strategic Highway Safety Plan. This Program is managed as a NHTSA grant program. <p>The Program calculates benefit/cost ratio to rank projects. At least one project from each County is selected and additional projects are selected based on overall ranking. The evaluation of the projects includes a 2- to 3-year before-and-after accident analysis. Evaluation is submitted annually to FHWA.</p>	Safety
Bridge Lead Paint Abatement	The Bridge Program's purpose is to effectively manage the state's bridge inventory in accordance with the applicable federal regulations. The program maintains records for state and county bridges including recurring bridge inspection and inventories. These records are the basis for developing priorities for lead paint abatement.	Safety (Environment and Sustainability)
Rockfall and Slope Stabilization	The Rockfall and Slope Stabilization Program prioritizes and implements projects to maintain integrity of roadway embankments and roadside slopes. The Program also handles emergency response related to rockslide and slope failures.	Safety (Environment and Sustainability, System Preservation and Security)
Retaining Walls	The Retaining Wall Program implements retaining wall projects that are identified in the Rockfall and Slope Stabilization Program.	Safety (Environment and Sustainability, System Preservation and Security)

TABLE 7
HDOT Highways Division Program Summary and Correlation to Planning Factors

Program/Subprogram	Purpose	Correlation to Planning Factors Primary (Secondary) Factors Addressed by program
Highway Shoreline Protection	The Shoreline Protection Program prioritizes and implements projects to maintain integrity of roadways and embankments adjacent to the shoreline. The Program also handles emergency response related to roadway failures from ocean impacts.	Safety (Environment and Sustainability, System Preservation and Security)
Guardrail and Shoulder Improvement	<p>The purpose of this program is to provide the motoring public with a better and safer guardrail system which will reduce injuries and increase survivability during crashes. It will also minimize tort liabilities against the state and ensure compliance with FHWA-mandated NCHRP 350 criteria on guardrails, end terminals, bridge railing, bridge end posts, and crash attenuators.</p> <p>The program identifies areas requiring new guardrail installation or requiring upgrading of existing guardrails and appurtenances with NCHRP 350 compliant hardware. The program also identifies areas requiring paved shoulder improvements which will enhance guardrail functioning and performance.</p>	Safety
Traffic Signal Upgrade	The Traffic Signal Upgrade Program focuses on upgrading aging traffic signal equipment to be compatible with current technology and standards. The program coordinates implementation of signal upgrades with other preservation, congestion, and safety projects.	Safety (System Preservation)
Highway Lighting Upgrade	The Highway Lighting Upgrade Program focuses on upgrading aging highway lighting equipment to be compatible with current technology, standards, and local requirements including regulations to protect wildlife. The program coordinates implementation of lighting upgrades with other preservation, congestion, and safety projects.	Safety (System Preservation, Environment and Sustainability)
Americans with Disabilities Act	The ADA Program focuses on accessibility of curb ramps and sidewalks. (Initially the program was established to address the consent decree ruling – what is the current status of the program?)	Safety (Transportation Access Mobility, Modal Integration)
Pedestrian	The Pedestrian Program prioritizes and implements projects to address pedestrian needs. Priorities are identified in the Statewide Pedestrian Master Plan. Priorities were developed to address gaps in the pedestrian system, areas in proximity to high-pedestrian land uses, areas with pedestrian-oriented populations and pedestrian accident locations. The Program includes the phased project that upgrades pedestrian signal heads to countdown timer displays.	Safety (Transportation Access Mobility, Modal Integration)
Bicycle	The Bicycle Program prioritizes and implements projects to address bicyclists' needs. Priorities are identified in Bike Plan Hawaii. Bike Plan Hawaii strives to integrate bicycling into the state's transportation system.	Safety (Transportation Access Mobility, Modal Integration)

TABLE 7
HDOT Highways Division Program Summary and Correlation to Planning Factors

Program/Subprogram	Purpose	Correlation to Planning Factors Primary (Secondary) Factors Addressed by program
System Preservation Programs		
Pavement Resurfacing	The Pavement Resurfacing Program prioritizes and implements projects that preserve the state transportation system through pavement overlays.	System Preservation (Economic Vitality, Safety)
Pavement Rehabilitation	The Pavement Rehabilitation Program prioritizes and implements projects that preserve the state transportation system through pavement repairs.	System Preservation (Economic Vitality, Safety)
Pavement Reconstruction	The Pavement Reconstruction Program prioritizes and implements projects that preserve the state transportation system through pavement reconstruction/replacement.	System Preservation (Economic Vitality, Safety)
Pavement Preventive Maintenance	The Pavement Preservation Program prioritizes and implements projects that preserve the state transportation system through preventive pavement maintenance.	System Preservation (Economic Vitality, Safety)
Bridge Replacement	The Bridge Program's purpose is to effectively manage the state's bridge inventory in accordance with the applicable federal regulations. The program maintains records for state and county bridges including recurring bridge inspection and inventories. These records allow for prioritizing bridges for replacement.	System Preservation (Economic Vitality, Safety)
Bridge Rehabilitation	The Bridge Program's purpose is to effectively manage the state's bridge inventory in accordance with the applicable federal regulations. The program maintains records for state and county bridges including recurring bridge inspection and inventories. These records allow for prioritizing bridges for rehabilitation including the widening of existing structures.	System Preservation (Economic Vitality, Safety)
Bridge Preventive Maintenance	The Bridge Program's purpose is to effectively manage the state's bridge inventory in accordance with the applicable federal regulations. The program maintains records for state and county bridges including recurring bridge inspection and inventories. These records allow for prioritizing bridges for preventive maintenance.	System Preservation (Economic Vitality, Safety)
Seismic Retrofit	The Bridge Program's purpose is to effectively manage the state's bridge inventory in accordance with the applicable federal regulations. The program maintains records for state and county bridges including recurring bridge inspection and inventories. These records allow for prioritizing bridges for seismic retrofit.	System Preservation (Economic Vitality, Safety)

TABLE 7
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Program/Subprogram	Purpose	Correlation to Planning Factors Primary (Secondary) Factors Addressed by program
Drainage Improvements	<p>The Drainage Program provides upgrades to the existing highway drainage system to maintain roadway integrity and operations. The Program assists the Districts' maintenance staff with immediate mitigation for existing and/or recurring drainage issues. The Program is intended to be a means to fast track design and construction of small drainage projects statewide.</p> <p>The Drainage Program solicits potential projects from the Districts biennially. Field investigations are conducted to determine if the project can be funded under the Program. Based on estimated construction cost, design schedule, and urgency of the project, the projects are then programmed into the budget. Programming is done for the next 2 to 3 fiscal years. Potential drainage projects that are not included in the Program are budgeted using other funding sources.</p>	System Preservation (Environment and Sustainability, Safety)
Traffic Signal Upgrade	The Traffic Signal Upgrade Program focuses on upgrading aging traffic signal equipment to be compatible with current technology and standards. The program coordinates implementation of signal upgrades with other preservation, congestion, and safety projects.	System Preservation (Safety)
Highway Lighting Replacement	The Highway Lighting Replacement Program focuses on replacement of highway lighting equipment. The program replaces damaged and stolen lighting components.	System Preservation (Safety)
Destination Sign Structure Replacement	The Destination Sign Structure Replacement Program upgrades aging destination sign structures to be compatible with current technology, standards, and local requirements.	System Preservation (Safety)
Pedestrian	The Pedestrian Program prioritizes and implements projects to address pedestrian needs. Priorities are identified in the Statewide Pedestrian Master Plan. Priorities were developed to address gaps in the pedestrian system, areas in proximity to high-pedestrian land uses, areas with pedestrian-oriented populations and pedestrian accident locations. The System Preservation aspect of the Program includes addressing sidewalk repair.	System Preservation (Transportation Access Mobility, Modal Integration)
Bicycle	The Bicycle Program prioritizes and implements projects to address bicyclists' needs. Priorities are identified in the Bike Plan Hawaii. Bike Plan Hawaii strives to integrate bicycling into the state's transportation system. The System Preservation aspect of the Program includes addressing bicycle facility repair.	System Preservation (Transportation Access Mobility, Modal Integration)

TABLE 7
HDOT Highways Division Program Summary and Correlation to Planning Factors

Program/Subprogram	Purpose	Correlation to Planning Factors Primary (Secondary) Factors Addressed by program
Contextual Landscape Program	The Contextual Landscaping Program is responsible for developing standards, guidelines, and policies for the sustainable protection and enhancement of the unique context of Hawaii's road corridors. The Program supports sustainable protection and landscaping components in other preservation projects. The standards, guidelines, and policies are currently being developed in the HDOT Sustainable Landscape Masterplan.	System Preservation, Environment and Sustainability, Economic Vitality (Safety, Modal Integration)
Erosion Control	The Erosion Control Program provides protection for bridge supports and roadway embankments from the effects of runoff and flowing of water.	System Preservation (Environment and Sustainability)
Signing and Striping	The Signing and Striping Program addresses meeting the federal requirements for reflectorization.	System Preservation (Safety)
Congestion Programs		
Intelligent Transportation System	<p>The ITS Program develops and provides regional ITS architecture statewide. The program also provides infrastructure and operations that address events along the highway system. One of the components of the program is the Freeway Management System on Oahu.</p> <p>The Freeway Management System provides infrastructure and operations that address both recurring and nonrecurring events that cause congestion on Oahu freeways. The program includes coordination with the City and County of Honolulu to establish the joint Traffic Control Center. The program also provides provision and operation of ITS infrastructure and the Freeway Service Patrol</p>	System Efficiency Management and Operations (Economic Vitality, Safety)
Intersection Operations Improvements	The Intersection Operations Improvements Program focuses on modification of intersections to address congestion and safety issues. The program coordinates implementation of signing, channelization and other intersection improvements with other preservation, congestion, and safety projects.	System Efficiency Management and Operations (Economic Vitality, Safety)
Traffic Signal Optimization	The Traffic Signal Optimization Program focuses on providing optimized traffic flow along corridors. The program provides infrastructure and operations for urban corridors that are connected to the Traffic Management Center (within urban Oahu area), and interconnects signals along key traffic flow corridors.	System Efficiency Management and Operations (Economic Vitality, Safety)
Traffic Signal Upgrade	The Traffic Signal Upgrade Program focuses on upgrading aging traffic signal equipment to be compatible with current technology and standards. The program coordinates implementation of signal upgrades with other preservation, congestion and safety projects.	System Efficiency Management and Operations (Economic Vitality, Safety)

TABLE 7
HDOT Highways Division Program Summary and Correlation to Planning Factors

Program/Subprogram	Purpose	Correlation to Planning Factors Primary (Secondary) Factors Addressed by program
Capacity Programs		
New Roads and Bridges	The Capacity Program provides identified capacity needs for all modes of travel. Capacity needs are identified and prioritized in the Long-Range Land Transportation Plans. The New Roads and Bridges program addresses the priorities that identify the need for new roadways.	System Efficiency Management and Operations (Economic Vitality, Safety, Modal Integration)
Bypass	The Capacity Program provides identified capacity needs for all modes of travel. Capacity needs are identified and prioritized in the Long-Range Land Transportation Plans. The Bypass program addresses the priorities that identify the need for highway bypasses.	System Efficiency Management and Operations (Economic Vitality, Safety, Modal Integration)
Widening	The Capacity Program provides identified capacity needs for all modes of travel. Capacity needs are identified and prioritized in the Long-Range Land Transportation Plans. The Widening program addresses the priorities that identify the need for roadway widening.	System Efficiency Management and Operations (Economic Vitality, Safety, Modal Integration)
Pedestrian	The Pedestrian Program prioritizes and implements projects to address pedestrian needs. Priorities are identified in the Statewide Pedestrian Master Plan. Priorities were developed to address gaps in the pedestrian system, areas in proximity to high-pedestrian land uses, areas with pedestrian-oriented populations and pedestrian accident locations. Pedestrian improvements related to Capacity address pedestrian demands and may include new facilities.	Modal Integration (Transportation Access Mobility)
Bicycle	The Bicycle Program prioritizes and implements projects to address bicyclists' needs. Priorities are identified in the Bike Plan Hawaii. Bike Plan Hawaii strives to integrate bicycling into the state's transportation system. Bicycle improvements related to Capacity address bicycle demands and may include new facilities.	Modal Integration (Transportation Access Mobility)
Environmental Programs		
Contextual Landscape Program	The Contextual Landscape Program is responsible for developing standards, guidelines and polices for the sustainable protection and enhancement of the unique context of Hawaii's road corridors. Priorities are currently being developed in the HDOT Statewide Sustainable Landscape Master Plan.	Environment and Sustainability, Economic Vitality, System Preservation (Safety, Modal Integration)

TABLE 7
 HDOT Highways Division Program Summary and Correlation to Planning Factors

Program/Subprogram	Purpose	Correlation to Planning Factors Primary (Secondary) Factors Addressed by program
Municipal Separate Storm Sewer System (MS4)	An MS4 permit is acquired on a 5-year timeframe that allows HDOT Highways Division to discharge stormwater runoff. Currently the MS4 is required only on Oahu. The MS4 Program elements address the conditions set forth in the permit. The Program priorities are defined in the permit conditions. The current Program elements include; Environmental Management System, Storm Water Monitoring, Debris Control, Erosion Control, Master Consultant and Highways Divisions Charges.	Environment and Sustainability
Other Programs		
Maui Transportation	Maui Transportation oversees three grant programs: Maui Bus, Maui Economic Opportunity, which provides paratransit service and Air Ambulance.	Transportation Access Mobility
Hawaii Mass Transit	The Hawaii County Mass Transit Agency provides public transportation around the island on the Hele-On bus. In addition, the Transit Agency offers a Shared Ride Taxi Program, which provides door to door transportation for as little as \$2.00 within the urbanized area of Hilo.	Transportation Access Mobility
Kauai Transportation	The Kaua'i Bus operates a public (fixed-route) bus service and a paratransit (door-to-door) bus service from Hanalei to Kekaha daily.	Transportation Access Mobility

Attachment 1
District of Hawaii Tier 2 Potential Solutions

Hawaii District Tier 2 Roadway Infrastructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
11	State	Mamalahoa Highway, Hilea Bridge	Rehab/replace existing bridge	System Preservation
11	State	Mamalahoa Highway, Ninole Bridge	Rehab/replace existing bridge	System Preservation
11	County	Mamalahoa Highway - Palani Road to Kuakini Highway	Highway upgrades (curves, shoulders, crosswalks)	System Preservation
11	State	Mamalahoa Highway, Napoopoo Road - vicinity of Captain Cook Road	Rock fall protection	Safety
11	State	Kanoelehua Avenue - Makalika Street to Kalaniana'ole Avenue	Improve/provide additional 2 travel lanes with turn lanes at major intersections, bicycle facilities and sidewalks	Capacity
11	State	Volcano Road - Hilo to Volcano National Park	Accommodate visitor travel to Volcano National Park - wayfinding improvements	System Preservation
11	State	Mamalahoa Highway, Naalehu	Realign roadway and install guardrail	Safety
11	State	Mamalahoa Highway - Keaau to Makalika Street	Improve/provide additional 2 travel lanes between Makalika Street and Keaau-Paho Bypass Road	Capacity
11	State	Mamalahoa Highway - Napoopoo Road intersection to Captain Cook	Additional 2 travel lanes including intersection improvements	Capacity
11	State	Mamalahoa Highway - Mountain View to Keaau	Improve/provide additional 2 travel lanes with turn lanes at major intersections	Capacity
11	State	Hawaii Belt Road - Napoopoo Road to Keawe Road	Additional 2 travel lanes including intersection improvements	Capacity
11	State	Volcano Road - Kanoelehua Avenue to Keaau-Paho Road	Signed shared road	Capacity
11	State	Mamalahoa Highway - Konawaena Road to Choice mart, Kealakekua Ranch Center (Greenwell Mountain Road)	Construct sidewalks	Capacity
11	State	Mamalahoa Highway - through Naalehu town to Ohai Road	Construct sidewalks	Capacity
11	State	Mamalahoa Highway - Captain Cook to Naalehu	Widen shoulders and sign as a shared roadway	Safety
11	State	Mamalahoa Highway - Kealakekua to Naalehu	Improve/install headwalls, guardrail and guardrail end treatments	Safety
11	State	Volcano Road, at Kipimana Street	Intersection operations improvements	Congestion
19	State	Hawaii Belt Road - portions of the highway at Maulua, Laupahoehoe and Kaawalii Gulches	Construct rockfall mitigation and slope stabilization	Safety
19	State	Hawaii Belt Road, Pahoehoe Stream Bridge	Rehab bridge	System Preservation
19	State	Kawainui Bridge	Rehab/replace existing bridge	System Preservation
19	State	Hawaii Belt Road - East Paauiolo, Aamanu, Kainehe, Kalapahapuu, Wailoa River Bridges	Rehab/replace existing bridges	System Preservation
19	State	Kalalau Bridge	Rehab/replace existing bridge	System Preservation
19	State	Kapehu Bridge	Rehab/replace existing bridge	System Preservation
19	State	Manoloa Bridge	Rehab bridge	System Preservation
19	State	Maulua Bridge	Rehab bridge	System Preservation
19	State	Waiaka Bridge and Kohala Mountain Road/Kawaihae Road Intersection	Widen and realign Waiaka Bridge and reconstruct adjacent intersection	System Preservation
19	County	Old Mamalahoa Highway - Honokaa area	Pavement rehabilitation	System Preservation

Hawaii District Tier 2 Roadway Infrastructure Potential Solutions

19	State	Hawaii Belt Road near Laupahoehoe	Review and improve highway illumination	Safety
19	State	Hawaii Belt Road - Saddle Road to Kona International Airport	Install guardrails	Safety
19	State	Hawaii Belt Road - MP30-40	Modify drainage and install warning signage, and skid resistant surface	System Preservation
19	State	Hawaii Belt Road - Waianuenu Avenue to Honomu	Widen existing two-lane highway to provide passing lanes, also intersection and safety improvements	Capacity
19	County	Mamalahoa Highway - Mud Lane to the North Hawaii Community Hospital	Improve highway to include bicycle facilities, shoulders, and turn lanes	Capacity
19	State	Hawaii Belt Road from Honokaa to Mud Lane	Widen existing two-lane highway to provide passing lanes and intersection safety improvements	Congestion
19	State	Hawaii Belt Road from Honomu to Honokaa	Widen existing two-lane highway to provide passing lanes, also intersection and safety improvements	Congestion
19	State	Kawaihae Road - Kohala Mountain Road to Mamalahoa Highway	Improve/provide additional 2 travel lanes with turn lanes at major intersections	Capacity
19	State	Queen Kaahumanu Highway	Analyze intersections operations, including grade separation of interchanges, to allow uninterrupted flow between Palani Road and Waikoloa Road	Congestion
19	State	Queen Kaahumanu Highway - Keahole Airport to Kawaihae Road	Construct shared use path	Capacity
19	State	Hawaii Belt Road near Paauilo Elementary School	Vicinity of Paauilo Elementary School – install additional school signs to indicate to motorists that the area is a school zone	Safety
19	State	Queen Kaahumanu Highway - Keahole Airport Road to Makala Boulevard	Shared use path	Capacity
19	State	Queen Kaahumanu Highway - Waikoloa Road to Kealakehe Parkway	Signed shared road	Capacity
19	State	Mamalahoa Highway - Kawaihae Road to Mana Road - East Waimea greenway in Waimea	Construct east portion of the Waimea Greenway	Capacity
19	State	Kamehameha Avenue at Lihikai Street and Manono Street	Intersection operations improvements	Congestion
19	State	Hawaii Belt Road at Pakalana Street and Maunaloa Street	Intersection operations improvements	Congestion
19	State	Queen Kaahumanu Highway - Keahole Airport Road to Kawaihae Harbor	Conduct planning and environmental study to assess alternatives and impacts to provide additional 2 travel lanes	Other
130	County	Pahoa Kalapana Road Reconstruction	Reconstruct existing road to current design and safety standards	System Preservation
130	State	Keaau-Pahoa Road	Improve/provide additional 2 travel lanes between Keaau-Pahoa Bypass Road and Kapoho Road	Capacity
130	State	Keaau-Pahoa Road - Bypass segment to Shower Drive	Signed shared roadway	Capacity
182	County	Lako Street Extension	Extend roadway from the existing Lako Street terminus to Alii Drive	Capacity
185	County	Kamehameha III Road - Kuakini Highway to Alii Drive	Additional 2 travel lanes including intersection improvements	Capacity
186	County	Alii Drive - Hualalai Road to Walua Road	Road improvements including bicycle, pedestrian, landscaping and scenic view improvements by undergrounding existing overhead utilities	System Preservation
186	County	Alii Drive - Palani Road to Keauhou Road	Signed shared roadway and various improvements	Capacity
186	County	Alii Drive and Lunapule Road intersection	Analyze intersection control to address congestion	Congestion

Hawaii District Tier 2 Roadway Infrastructure Potential Solutions

190	State	Mamalahoa Highway - Lalamilo Farm Road to the south	Realign highway	System Preservation
190	State	Mamalahoa Highway - MP 14 to 17	Upgrade substandard sections, widen shoulders, and remove rock outcroppings	System Preservation
190	State	Mamalahoa Highway and Kaloko Drive intersection	Channelize the intersection (turn lanes)	System Preservation
190	State	Mamalahoa Highway (Highway 190), Waimea Bypass to Lindsey Road	Additional 2 travel lanes with separate turning lanes at major intersections	Capacity
190	County	Palani Road - Hina Lani Street to Henry Street	Widen shoulders and signed shared roadway	Safety
191	County	Waikoloa Road	Resurface and maintain travel lanes and shoulders	System Preservation
191	County	Waikoloa Road - between Waikoloa Village and Hawaii Belt Road	Provide advanced signing, and enhance signing and striping through the horizontal curves along Waikoloa Road	System Preservation
191	County	Waikoloa Road - Mamalahoa Highway to Queen Kaahumanu Highway	Additional 2 travel lanes	Capacity
191	County	Waikoloa Road/(makai) Paniolo Road intersection	Assess intersection safety, operations, and warrants, and construct intersection improvements	Congestion
191	County	Waikoloa Road	Construct truck runaway ramps	Other
197	State	Kealakehe Parkway Extension - Keanalehu Drive to Kealakaa Street	Extend Kealakehe Parkway between Keanalehu Drive and Kealakaa Street	Capacity
197	State	Kealakehe Parkway - Queen Kaahumanu Highway to Keanalehu Drive	Construct bike lanes	Capacity
198	County	Kaiminani Drive	Resurface roadway and repair sidewalks	System Preservation
198	County	Kaiminani Drive - (future) Henry Street Extension (Ane Keohokalole Highway) to Queen Kaahumanu Highway	Additional 2 travel lanes including intersection improvements	Capacity
200	County	Saddle Road - western portion realignment to Mamalahoa Highway	Straighten and realign new Saddle Road closer to Kona	System Preservation
200	County	Saddle Road - existing western terminus	Maintain Saddle Road, existing western terminus at Mamalahoa Highway (after the realigned Saddle Road is built), including upgrade of existing bridges	System Preservation
200	State/County	Saddle Road - existing terminus to West Puainako Street/Iwalani Street intersection	Complete Saddle Road widening into center of industrial/commercial area	Capacity
200	State	Saddle Road Extension - Mamalahoa Highway to Queen Kaahumanu Highway	Extend Saddle Road between the western terminus of the Saddle Road realignment and Queen Kaahumanu Highway	Capacity
200	County	Saddle Road, on the East side, between MP 11 and MP 19	Construct truck runaway ramps	Other
250	State	Kohala Mountain Road	Highway improvements - vertical/horizontal alignment and sight distance	Safety
250	State	Kohala Mountain Road	Install guardrails	Safety
270	State	Kawaihae Road Safety Improvements	Safety improvements along the highway (geometry, sight distance and truck ramps)	System Preservation
270	State	Akoni Pule Highway - Hawi to Niulii	Encourage the improvements of that portion of the Akoni Pule Highway between the towns of Hawi to Niulii	System Preservation
270	State	Akoni Pule Highway - north of Kawaihae Harbor	Maintain the two bridges north of Kawaihae Harbor (Honokaa Gulch, Kaiopae Gulch)	System Preservation
270	State	Akoni Pule Highway - Kawaihae Road to Hawi Road	Signed shared road	Capacity
270	State	Akoni Pule Highway, Mahukona Wharf Access Road to Hawi Road	Improve Akoni-Pule Highway bicycle routes, including signage, from Mahukona Wharf Access Road to Hawi Road	Safety

Hawaii District Tier 2 Roadway Infrastructure Potential Solutions

270	State	Akoni Pule Highway	Construct pedestrian paths along Akoni Pule Highway through the Kawaihae corridor and add appropriate signage to increase safety	Capacity
270	State	Akoni Pule Highway	Upgrade substandard sections, install guardrail from MP 4 to MP 15	Safety
1100	State	Kuakini Highway - Henry Street to Kamehameha III Road	Improve/provide additional 2 travel lanes and include bicycle facilities and sidewalks	Capacity
1100	State	Kuakini Highway - Kamehameha III Road to Mamalahoa Highway	Additional 2 travel lanes including intersection improvements	Capacity
1100	State/County	Kuakini Highway - Hualalai Road to Lako Street	Construct bike lanes	Capacity
1100	State	Kuakini Highway - Palani Road to Makala Boulevard	Create sidewalk on the mauka side	Safety
1100	State	Kuakini Highway and Kaiwi Street intersection	Install crosswalks in mauka-makai direction	Safety
1100	State	Kuakini Highway at Lako Street	Improve intersection operations	Congestion
1110	County	Alii Highway - Kamehameha III Road to Queen Kaahumanu Highway	Additional 2 travel lanes between Kamehameha III Road and Queen Kaahumanu Highway	Capacity
1110	County	Alii Highway Extension (Hokulia Bypass) - Halekii Street to Napoopoo Road/Mamalahoa Highway	Additional 2 travel lanes between Halekii Street and Napoopoo Road/Mamalahoa Highway	Capacity
1370	State	Kalaniana'ole Avenue, Kano'elehua Avenue and Silva Street (vicinity of Hilo Harbor)	Upkeep highway drainage and pavement due to heavy truck use and drainage issue	System Preservation
1370	State/County	Kalaniana'ole Avenue - Kano'elehua Avenue to Hilo Harbor	Improve/provide additional 2 travel lanes with turn lanes at major intersections, bicycle facilities and sidewalks	Capacity
1370	County	Railroad Avenue - existing termini to Kekuanaoa Street	Extend to connect with Kekuanaoa Street (Airport Road)	Capacity
1810	County	Nani Kailua Drive - Hualalai Road to Alii Drive	Additional 2 travel lanes between Hualalai Road and Alii Drive	Capacity
1810	County	Nani Kailua Drive - Hienaoli Road to Mamalahoa Highway	Extend mauka to intersect with Mamalahoa Highway	Capacity
1880	County	Ane Keohokalole Highway - Hina Lani Street to Kaiminani Drive	Additional 2 travel lanes between Hina Lani Street and Kaiminani Drive with bicycle facilities and sidewalks	Capacity
1880	County	Ane Keohokalole Highway - Hina Lani Street to Kealakehe Parkway	Improve existing roadway to include bicycle lanes and intersection upgrades	Capacity
1910	State/County	Kamehameha Avenue - Waianuenu Avenue to Wailoa River Bridge	Construct bike lanes	Capacity
1920	County	Kilauea Avenue - Waianuenu Avenue to West Puainako Street	Construct bike lanes	Capacity
1940	County	Komohana Street - Ainaola Drive to Waianuenu Avenue	Additional 2 travel lanes with separate turning lanes and/or signals at major intersections	Capacity
1940	County	Komohana Street - Waianuenu Avenue to Ainaola Drive	Construct bike lanes	Capacity
1940	County	Komohana Street and West Kawai'ani Street intersection	Review intersection safety and operations, perform necessary warrants for intersection controls	Congestion
1940	County	Komohana Street/West Kawai'ani Street	Intersection congestion	Congestion
1960	County	Railroad Avenue	Resurface and maintain travel lanes and shoulders	System Preservation
1960	County	Railroad Avenue Bikeway	Shared use path with local connection from the Railroad Avenue Bikeway to the Keaau Schools Complex	Capacity
1960	County	Railroad Avenue - East Kaha'opea Street to Keaau	Railroad Avenue Bikeway	Capacity

Hawaii District Tier 2 Roadway Infrastructure Potential Solutions

1960	County	Railroad Avenue - Leilani Street to the end of the street (at Kaaahi Road)	Signed shared road	Capacity
2000	State	Puainako Street - Kanoelehua Avenue to Komohana Street	Realign/provide additional 2 travel lanes between Kanoelehua Avenue and Komohana Street to include sidewalks	Capacity
2000	State	West Puainako Street - Komohana Street to Kinoole Street	Construct bike lanes	Capacity
2000	State	West Puainako Street - vicinity of Waiakea High School, University of Hawaii at Hilo and Hawaii Community College	Review intersection safety and operations, perform necessary warrants for intersection controls	Congestion
2000	State	West Puainako Street and Kinoole Street intersection	Review intersection safety and operations, perform necessary warrants for intersection controls	Congestion
2720	County	Waianuenu Avenue and Kaumana Drive	Improvements along the entire corridor	System Preservation
2720	County	Waianuenu Avenue - near Waiiau Street/Hospital	Cut down and clear albezia trees along side of road below hospital to keep access open	System Preservation
2720	County	Waianuenu Avenue - bridge between hospital and Carvalho Park	Upgrade bridge	System Preservation
2720	County	Waianuenu Avenue - Bayfront Highway to the Hilo Medical Center	Construct bike lanes	Capacity
2760	County	Kupulau Road Extension - Kawaiiani Street to Puainako Street Extension	Additional 2 travel lanes with separate turning lanes at major intersections	Capacity
2760	County	Kupulau Road Extension - Puainako Street Extension to Komohana Street/Ponohawai Street intersection	Additional 2 travel lanes with separate turning lanes at major intersections	Capacity
2760	County	Kawaiiani Street - Komohana Street to Kinoole Street	Signed shared road	Capacity
2770	County	Kawili Street - Puainako Street to Kilauea Avenue	Additional 2 travel lanes including intersection improvements	Capacity
2770	County	East Kawili Street - Kilauea Avenue to Kanoelehua Avenue	Construct bike lanes	Capacity
2770	County	Manono Street - East Kawili Street to Bayfront Highway	Construct bike lanes	Capacity
2790	County	Mohouli Street - Komohana Street to Kilauea Avenue	Improve/provide additional 2 travel lanes between Komohana Street and Kilauea Avenue	Capacity
2790	County	Mohouli Street - Komohana Street to Kilauea Avenue	Construct bike lanes	Capacity
2810	County	Kekuanaoa Street - Kilauea Avenue to Kanoelehua Avenue	Additional 2 travel lanes with separate turning lanes at major intersections	Capacity
2810	County	Kekuanaoa Street - Kilauea Avenue to Kanoelehua Avenue	Construct bike lanes	Capacity
2820	County	Lanikaula Street/Kumukoa Street - Mohouli Street to Kanoelehua Avenue	Additional 2 travel lanes including intersection improvements	Capacity
2850	County	Akolea Road - Piihonua to Kaumana Drive	Improve the existing portion of Akolea Road to provide a cross-city connection between Upper Wailuku and Waiakea-Uka	System Preservation
11/180	State	Mamalaho Highway and Hawaii Belt Road - Kona Airport to Milolii	Improve lane and shoulder widths, install guardrails, rockfall netting, and speed signs	Safety
250/19	State	Kohala Mountain Road and Kawaihae Road	Intersection safety and operational improvements	Congestion
270/19	State	Akoni Pule Highway and Kawaihae Road Intersection	Conduct a traffic study to review the sight distance and the feasibility of a marked crosswalk, pedestrian signage and highway lighting at the intersection	Safety
270/19	State	Kawaihae Road/Akoni Pule Highway/Queen Kaahumanu Highway	Intersection safety and operational improvements	Congestion
N/A	State/County	Islandwide rockfall and shoreline protection	Protect/prevent rockfall and shoreline erosion	System Preservation

Hawaii District Tier 2 Roadway Infrastructure Potential Solutions

N/A	State/County	Islandwide safety improvements	Safety improvements	Safety
N/A	County	Kupulau Road - Ainaola Drive to Kawaihani Street	Reconstruct existing two-lane road to current design and safety standards	System Preservation
N/A	State	Bayfront Highway - Singing Bridge	Modernize "Singing" bridge over the Wailuku River	System Preservation
N/A	State/County	Evacuation Study and Preparation	Study hardening, flood proofing, and bypass alternatives for major highways	Other
N/A	Federal Grant Program/County Applicant - SRTS	Safe Routes to School (SRTS) projects	Safe routes to school project	Safety
N/A	County	Hawaiian Ocean View Estates	Establish an evacuation route through Hawaiian Ocean View Estates subdivision to Highway 11	Other
N/A	County	Naalehu Evacuation Route	Construct evacuation route	Other
N/A	County	Mid-Level Road (Puna Makai Alternate Route)	Additional 2 travel lanes makai of Keaau-Pahoa Road between Hilo and Pahoa	Capacity
N/A	County	Keaau - Pahoa area	Identify and construct an evacuation route	Other
N/A	County	Pratt Road	Establish an emergency bypass around Hawi and Kapaa	Other
N/A	County	Waikoloa Village	Evacuation Road for Waikoloa Village	Other
N/A	County	Intelligent Transportation System projects	Implement Intelligent Transportation System projects	Congestion
N/A	County	Akoni Pule Highway Bypass	Identify a location for an emergency bypass from Halaula to Pololu	Other
N/A	County	Akoni Pule Highway to Kohala Mountain Road	Develop a mauka-makai road to support emergencies/evacuation	Other
N/A	State	Kawaihae Bypass - Mamalahoa Highway to Akoni Pule Highway	Additional 2 travel lanes with turn lanes at major intersections	Capacity
N/A	County	Komohana Street Extension - Ainaola Drive to Leimamo Street	Extend Komohana Street to Leimamo Street including intersection improvements	Capacity
N/A	County	Komohana Street Extension - Leimamo Street to Hawaii Belt Road	Extend Komohana Street with separate turning lanes at major intersections	Capacity
N/A	County	Kealakaa Street Extension - Existing terminus to Kaiminani Drive	Extend Kealakaa Street including intersection improvements as required	Capacity
N/A	County	Kuakini Highway Extension - Makala Boulevard to Kealakehe Parkway	Extend Kuakini Highway to Kealakehe Parkway	Capacity
N/A	County	Paniolo Avenue Extension (to proposed Waimea Bypass Road)	Extend Paniolo Avenue with separate turning lanes at major intersections	Capacity
N/A	State/County	Kona area	Analyze intersection improvements (overpasses, roundabouts, traffic signals) to address congestion	Congestion
N/A	State/County	Hilo and Kawaihae Harbors Evacuation	Study hardening and evacuation requirements for Hilo and Kawaihae Harbors	Other
N/A	State/County	Hilo and Kona Airports Evacuation	Study hardening and evacuation requirements for Hilo and Kona Airports	Other
N/A	State/County	Old Volcano Trail	Construct shared use path	Capacity
N/A	State	Waimea Bypass (Mud Lane Section) - Mud Lane to Waimea Airport	New two-lane highway with separate turning lanes at major intersections	Capacity
N/A	State	Bayfront Highway - Waianuenue Avenue to Pauahi Street to Bayfront crossover to Manono Street	Construct bike lanes	Capacity
N/A	County	Hilo Bayfront Trails	Construct shared use path	Capacity
N/A	County	Kapoho-Kalapana Ridge Trail	Construct shared use path	Capacity
N/A	County	Komohana Street Extension - Waianuenue Avenue to Hawaii Belt Road via Wainaku Street	New two-lane highway with separate turning lanes at major intersections	Capacity
N/A	County	Akolea Road Extension - current terminus to the upper reaches of Ainaola Drive	Construct an extension of Akolea Road to provide a cross-city connection between Upper Wailuku and Waiakea-Uka	Capacity

Hawaii District Tier 2 Roadway Infrastructure Potential Solutions

N/A	County	Old Airport Coastal Path	Construct a new coastal shared use path	Capacity
N/A	County	Waimea Town	Create a corridor through Waimea Town along the Waikoloa Stream consisting of trails and greenways	Capacity
N/A	County	Civic Center Loop	Including Aupuni Street and Pauahi Street – bike lane	Capacity
N/A	State	Queen Kaahumanu Highway (extension segment) - Henry Street to Kuakini Highway	Signed shared road	Capacity
N/A	State	Intersection safety improvements	Improve safety	Safety
N/A	State	Non-intersection safety improvements	Improve safety	Safety
N/A	County	Intersection safety improvements	Improve safety	Safety
N/A	County	Non-Intersection safety improvements	Improve safety	Safety
N/A	State	Bayfront Highway at Kaipalaoa Landing	Conduct a traffic signal study to install a series of marked crosswalks to link Downtown Hilo to the waterfront	Safety
N/A	County	Downtown Hilo	Bike rental program	Capacity
N/A	County	Post-disaster Transit Plan	Develop post-disaster transit plan	Other
N/A	State	Puainako Street Extension - current terminus to the airport	Extend Puainako Street east of Kanoiehua to be the main route from the airport terminal for direct access to the business district	Capacity
N/A	County	Downtown Hilo	Install more bike racks	Capacity
N/A	County	South Kona Circulation Plan	Develop a roadway network circulation plan in cooperation with the State	Other
N/A	State	Hilo and Kawaihae Harbors vicinity	Install permanent weigh station equipment	Other

Hawaii District Tier 2 Transit Services and Operations Potential Solutions

Jurisdiction	Project Description	Primary Program
County	Increased support for bus service to North and South Kohala	Congestion
County	Sustainable transit to Puna area	Congestion
County	Provide real-time transit information	Congestion
County	Operate public transit	Congestion
County	Purchase buses and operate bus transit facilities	Congestion
County	Plan for mass transit corridor along Volcano Road and Keaau-Pahoa Road	Congestion
County	Provide mass transit or rail between Pahoa and Hilo	Congestion
County	Increase buses to/from and within Hilo town	Congestion
County	Increase bus service 1/2 hour schedules	Congestion
County	Modify transit service to a Hub/Spoke Bus system	Congestion
County	Clearly defined bus stops	Congestion
State/County	Shared public transportation and freight transportation between Kona and Kawaihae (i.e. solar tram)	Congestion
County	Construct bus stops with shelters along Alii Drive between Lako Street and Keauhou Plaza	Congestion
County	1. Make designated bus stops. 2. Integrate bus/bike routes between major sites (airport, regional park, town) and along mid-level highway region (school, civic centers) 3. Park & ride options to be developed along Queen K (Airport, university, Nelha area)	Congestion
County	More bus stops along Queen Kaahumanu Highway	Congestion
County	Awareness Programs - Promote bus to beach/park, bus to bike, bus to bus programs; radio communications, maps, signage, safe lighted/clean areas	Congestion



Appendix G

Expenditure and Funding Summary

Statewide Federal-Aid Highways 2035 Transportation Plan and Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai

Expenditure and Funding Summary

PREPARED FOR: States of Hawaii Department of Transportation

PREPARED BY: CH2M HILL

DATE: October 9, 2012

Introduction

An assessment of recent and planned State of Hawaii Department of Transportation, Highways Division (HDOT) expenditures and funding was conducted to aid in the development of the financial element of the Statewide Federal-Aid Highways 2035 Transportation Plan and the Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai. The assessment was performed to illustrate current Highways Division priorities through summaries of implemented and planned Program fund allocations. The summaries will be used as a tool to understand mid- and long-term funding needs, but are not intended to be used to forecast funding trends.

This memorandum summarizes the short-term historical and projected expenditures by Program as of September 2010 at the statewide and district levels. Historical data are presented for federal fiscal years (FFY) 2006-2009 and projected expenditures are presented for FFY 2011-2014.

Historical revenue sources are summarized to identify the level of contribution for various state and federal revenues that fund the HDOT Highways Programs.

Historical and Projected Funding by Program

Within the time periods reviewed, HDOT subprograms and projects were programmed under the following overarching Highways Division Programs:

- **System Preservation Program** – provides regular maintenance, rehabilitation, reconstruction, and replacement of transportation facilities to maintain the overall operations of the transportation system.
- **Capacity Program** – provides support to address capacity needs for all modes of land transportation through widening of existing facilities or provision of new facilities.
- **Congestion Program** – manages and optimizes performance of current infrastructure to improve mobility, reliability, and predictability of travel within the existing transportation system.
- **Safety Program** – provides education, and roadway and roadside infrastructure improvements that reduce the severity and number of crashes. The Safety Program also

focuses on upgrading existing transportation infrastructure to current environmental and safety requirements through industry best practices.

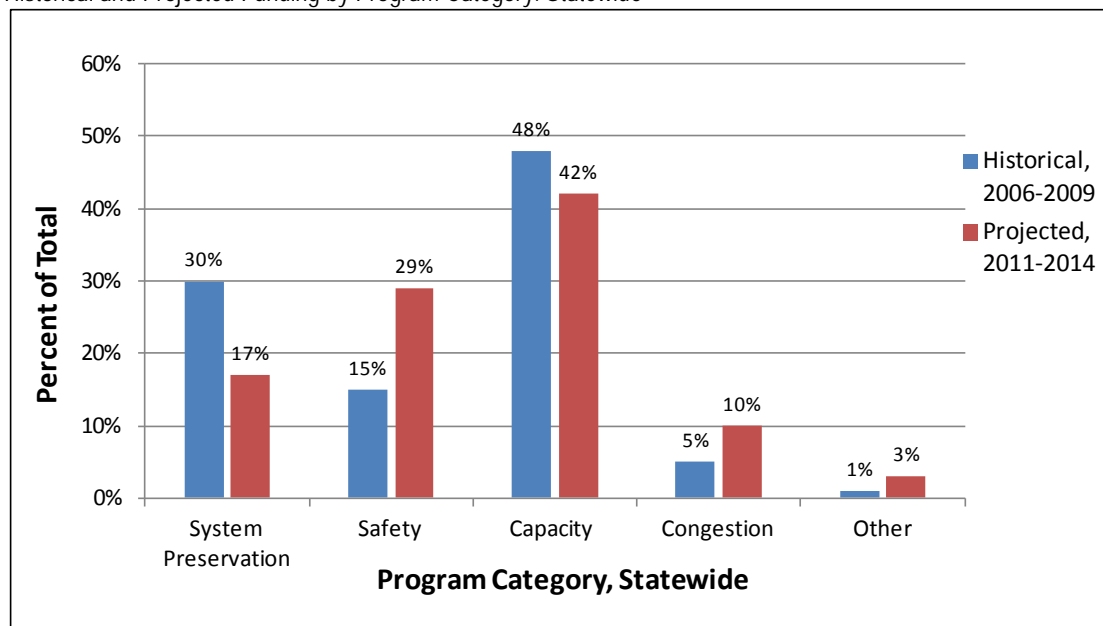
- **Other** - captures improvements to HDOT Highways Division facilities, right-of-way closeout costs, the Highways Planning Program, research studies, and staff labor.
- **Environmental Program** - manages the storm water runoff permit conditions defined by the United States Environmental Protection Agency. Landscaping and related roadside environment best practices are also provided through this program.

Exhibits 1 through 5 show comparisons of historical and projected funding by HDOT Highways Program. A statewide comparison is shown in Exhibit 1, followed by comparisons of each HDOT Highways District.

On a percentage basis, the FFY 2011-2014 STIP (as of September 2010) decreases funding for the System Preservation Program and Capacity Program and increases funding for the Congestion Program and Safety Program compared to FFY 2006-2009. The Environmental Program was established after 2009; therefore, no historical financial data for this program in FFY 2006-2009 are available.

EXHIBIT 1

Historical and Projected Funding by Program Category: Statewide

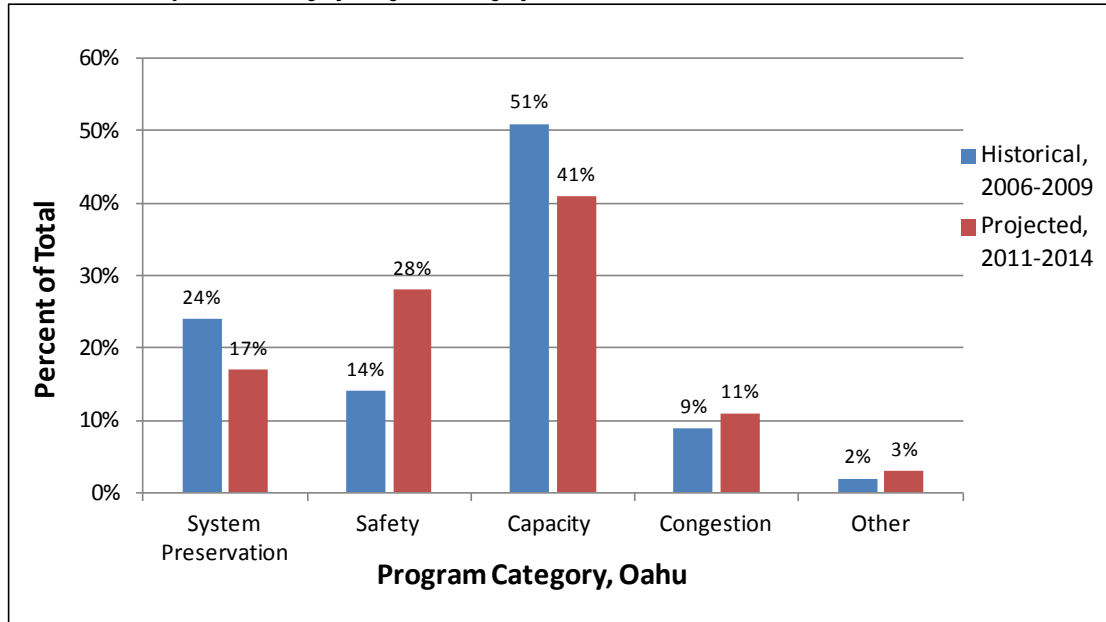


Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program
September 1, 2010.

In the Oahu District, Exhibit 2 illustrates that the proportion of funding allocated to the System Preservation and Capacity Programs is projected to decrease, and the proportion allocated to the Congestion and Safety Programs is projected to increase compared to recent historical levels. The Capacity Program, however, is projected to continue to use the highest proportion of the Oahu District funds.

Some of the major projects that contribute to the relative increase in Congestion and Safety Program funds include improvements to the congestion freeway management system, the Alapai Transportation Management Center, replacement/rehabilitation of bridges along Kamehameha and Kalaniana'ole Highways, H-1 guardrail/shoulder improvements, and Highway Safety Improvement Program improvements.

EXHIBIT 2
Historical and Projected Funding by Program Category: Oahu District

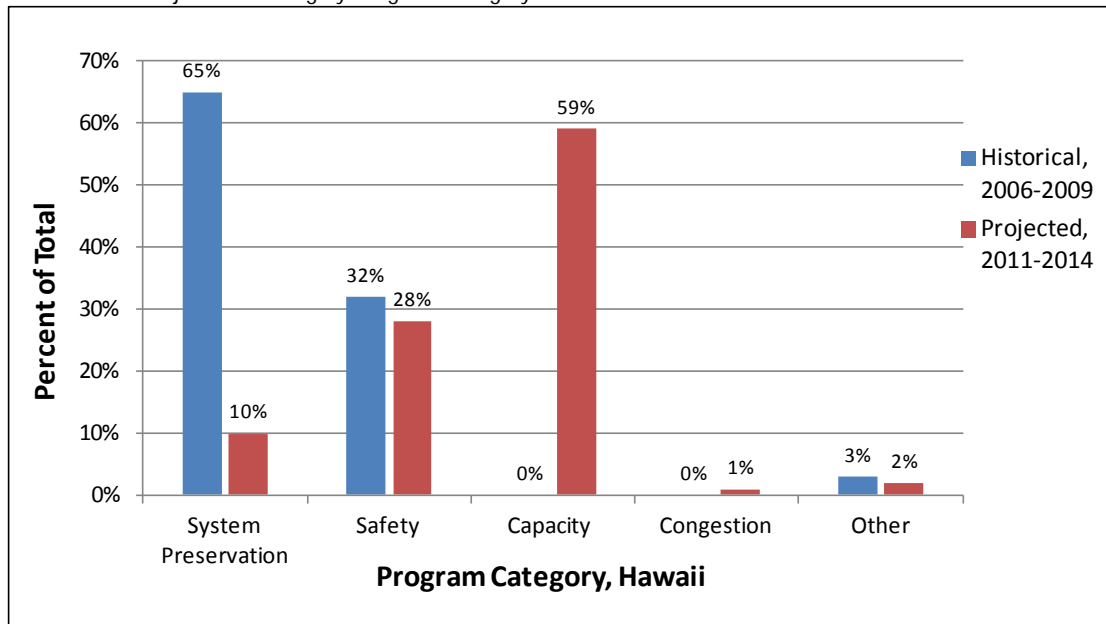


Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program
September 1, 2010.

Exhibit 3 depicts that funding allocations for the Hawaii District are projected to change significantly with the proportion of funds allocated to the Capacity Program increasing, and the proportion of funds allocated to the System Preservation Program decreasing. As of September 2010, the planned Capacity funds are largely programmed for construction of the Saddle Road improvements.

EXHIBIT 3

Historical and Projected Funding by Program Category: Hawaii District



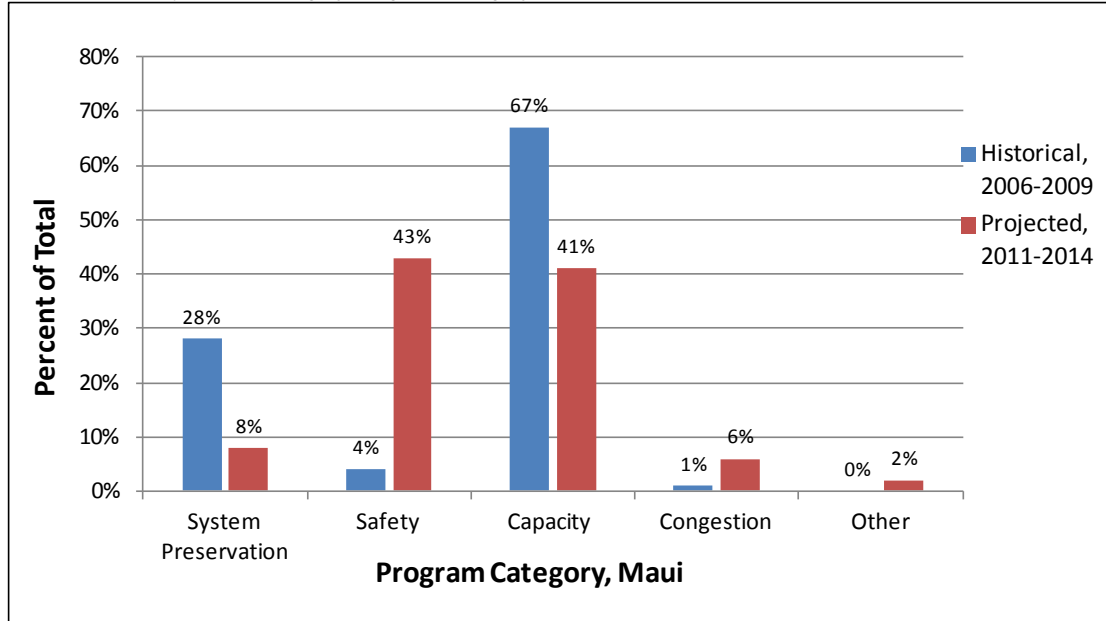
Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
 FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program
 September 1, 2010.

By contrast, Exhibit 4 shows in the Maui District that the proportion of funds allocated to the Safety Program is projected to increase, and the proportion of funds allocated to the Capacity and System Preservation Programs is projected to decrease. This reflects the recent completion of projects on Honoapiilani Highway, Haleakala Highway, and Mokulele Highway.

Planned Safety Program projects include the Waiehu Beach Road (Iao Stream Bridge) bridge rehabilitation, Kamehameha V Road (Makakupaia Bridge) bridge replacement, Honoapiilani Highway (Honolua Bridge) bridge replacement, guardrail/shoulder improvements, Highway Safety Improvement Program improvements, and shoreline protection projects.

EXHIBIT 4

Historical and Projected Funding by Program Category: Maui District



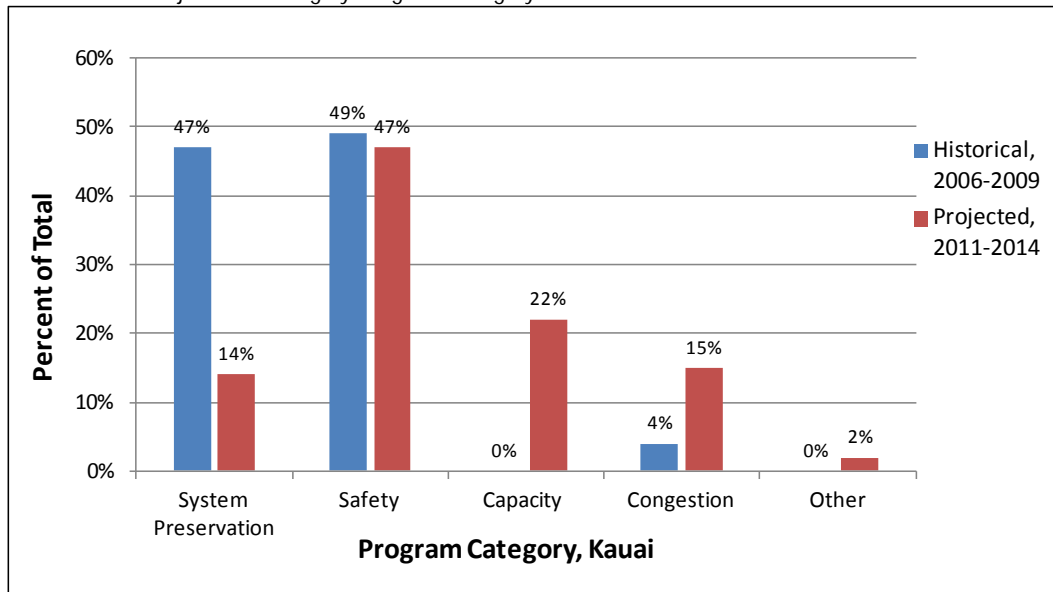
Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
 FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program
 September 1, 2010.

Exhibit 5 shows the proportion of funds allocated in the Kauai District. Funds allocated to the Capacity and Congestion Programs are projected to increase whereas the funds allocated to the System Preservation Program are projected to decrease. The Safety Program is projected to continue to use nearly half of the Kauai District funds. This is largely attributed to the Kuhio Highway improvements to the Wailua Cane Haul Bridge Widening (contracted in 2009) and the planned bridge replacements/rehabilitation projects (Kapaia Bridge, Kapahi Bridge, Omao Bridge, Puuopae Bridge, Waioli, Waipa, and Waikoko Stream Bridges).

The high level of System Preservation Program funds in the FFY 2006-2009 period included numerous resurfacing projects along Kauai's major highways: Kaumualii Highway, Kuhio Highway, and Kapule Highway.

The planned increase in the Capacity and Congestion Programs include the Kaumualii Highway, Anonui Street to Kipu Road improvements, Lydgate Park to Kapaa Bike/Pedestrian Path, and various intersection operation improvement projects.

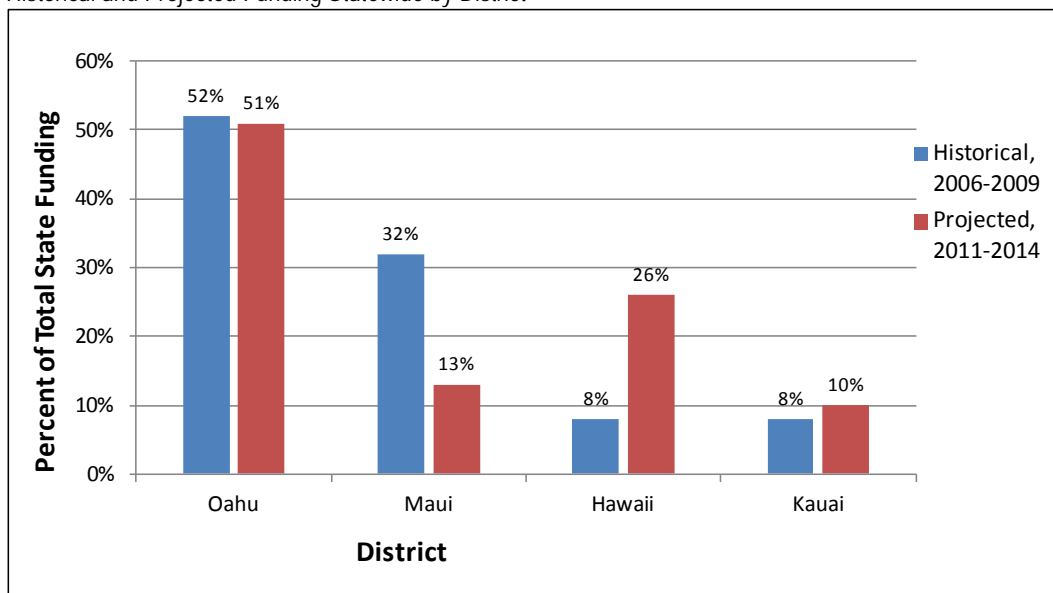
EXHIBIT 5
 Historical and Projected Funding by Program Category: Kauai District



Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
 FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program
 September 1, 2010.

Exhibit 6 compares historical and projected funding by District. As shown, the proportion of funds allocated to the Hawaii District is projected to increase, and the proportion allocated to the Maui District is projected to decrease. The relative proportion of funding to the Oahu and Kauai Districts is projected to remain very close to that experienced from FFY 2006-2009.

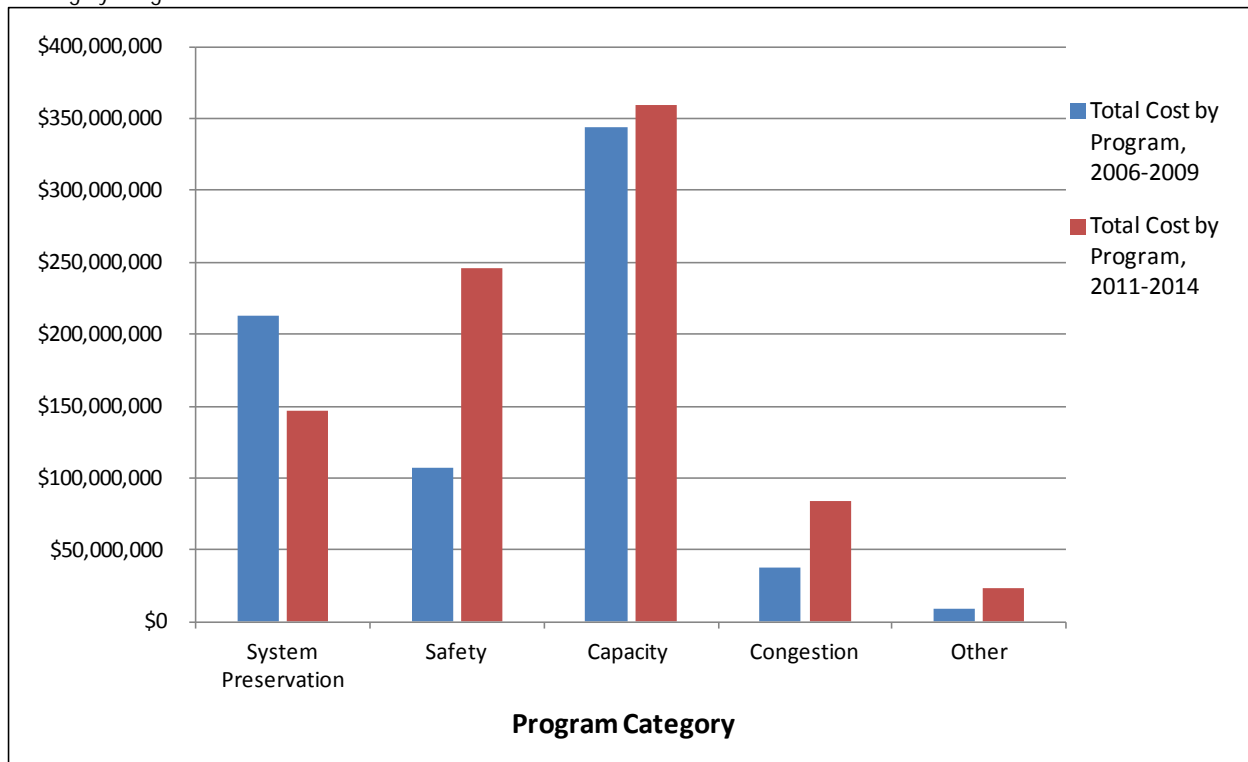
EXHIBIT 6
 Historical and Projected Funding Statewide by District



Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
 FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program
 September 1, 2010.

Exhibit 7 compares historical and projected future funding by Program in dollars. As shown, the Capacity Program has received more funding than any other Program with nearly \$350 million in funding. Projected future funding for the Capacity Program is expected to remain similar to that of the recent past. When compared to actual expenditures in FFY 2006-2009, the September 2010 STIP focuses on the Safety Program and the Congestion Program, with a decline projected for the System Preservation Program.

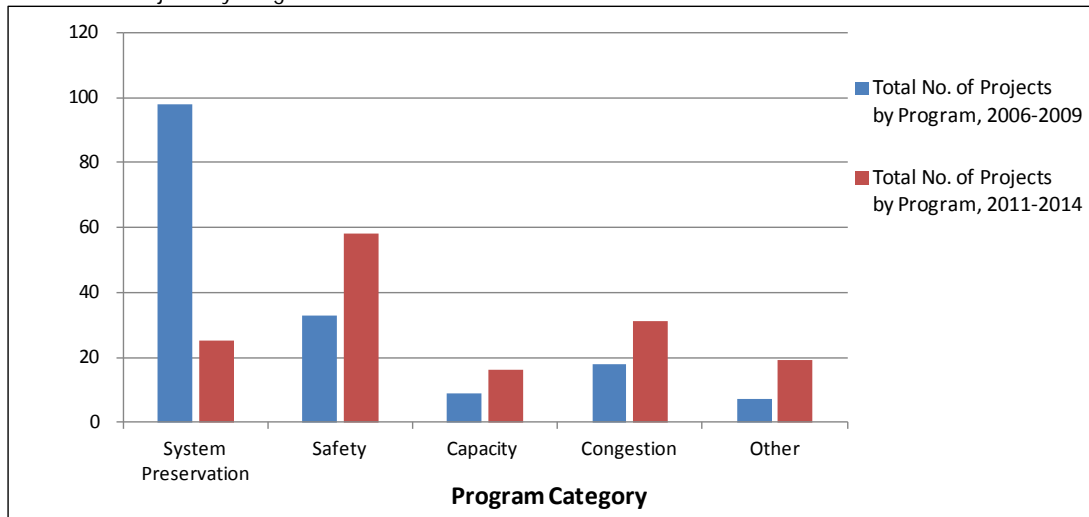
EXHIBIT 7
Funding by Program



Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

Exhibit 8 shows a summary of the number of projects funded in each Program from FFY 2006 to 2009 and the number of projects funded from FFY 2011 to 2014. One hundred sixty-five projects were contracted from FFY 2006 to 2009. Nearly 100 projects were contracted under the System Preservation Program. The September 2010 STIP anticipates commencement of 148 projects. The Safety Program is expected to see the largest increase in the number of projects completed from FFY 2011 to 2014. Compared to FFY 2006 to 2009, the current STIP increases the number of projects in all categories except System Preservation.

EXHIBIT 8
Numbers of Projects by Program

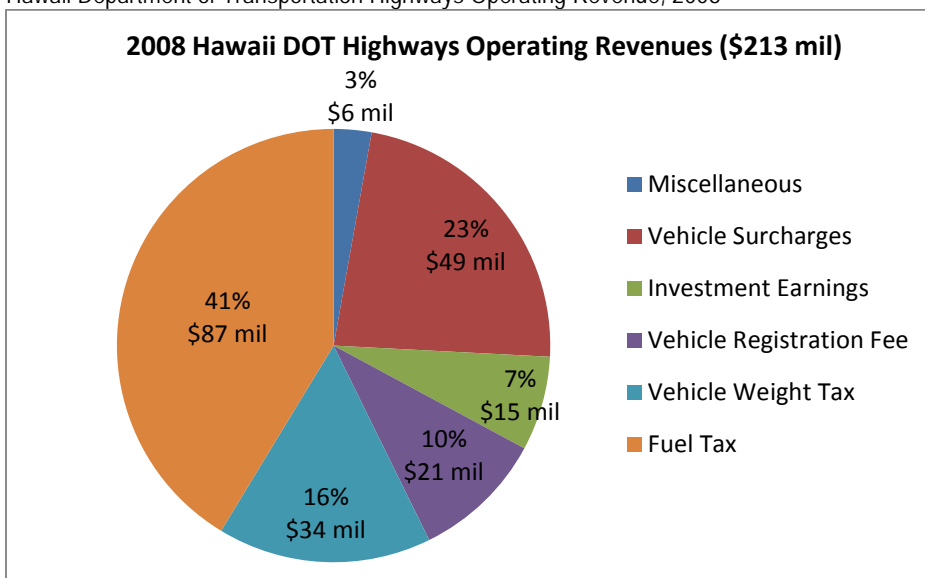


Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

Historical State and Federal Revenue Sources

HDOT Highways Division relies on funding from state and federal sources to maintain and enhance transportation facilities. Sources of state funding include vehicle surcharges, registration fees, vehicle weight taxes, fuel tax, investment earning, and miscellaneous income. In 2008, the HDOT Highways Division reported operating revenue of approximately \$213 million. Exhibit 9 presents a breakdown of state sources of funding in 2008. Fuel tax revenue accounted for 41 percent of HDOT Highways revenues. Vehicle surcharges, weight tax, and registration fees comprised 23 percent, 16 percent, and 10 percent of revenues, respectively.

EXHIBIT 9
Hawaii Department of Transportation Highways Operating Revenue, 2008



Source: HDOT, 2010

Estimates of HDOT Highways revenues for 2009 were reporting a slight reduction in revenues when compared to 2008. Revenues for 2009 were expected to be approximately \$196 million (HDOT, 2010). Revenue growth is expected to remain flat because of the economic recession's impact on tax and fee revenue.

Exhibit 10 presents historical funding received from the Federal Highway Administration in the State of Hawaii. Funding has remained relatively constant over the past four years, increasing from approximately \$168 million in 2006 to \$172 million in 2009. Over 84 percent of the federal money comes from five programs: National Highway System, Surface Transportation, Bridge Replacement and Rehabilitation, High Priority Projects, and Equity Bonus.

EXHIBIT 10
Federal Highway Administration Funding, 2006-2009

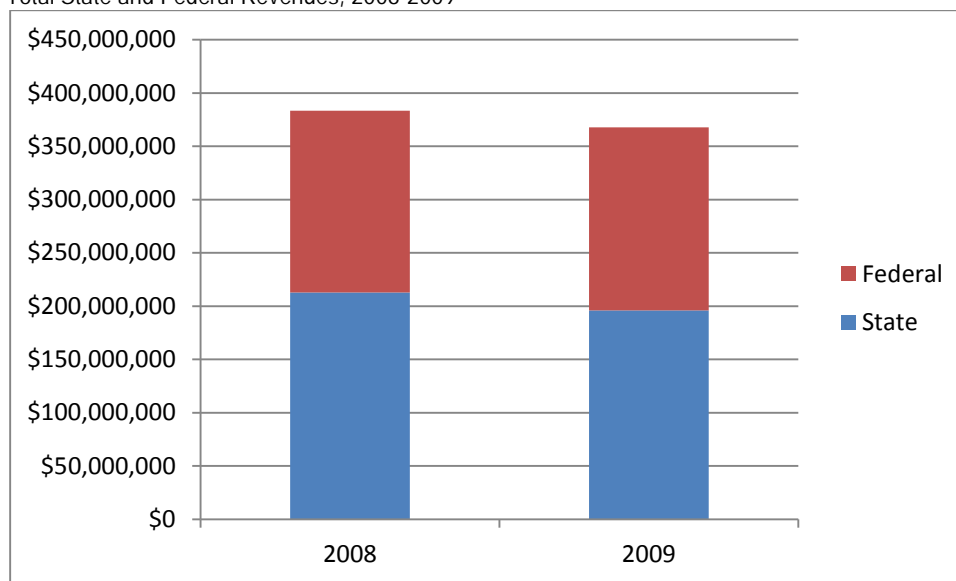
USDOT Federal Highway Administration Program	2006	2007	2008	2009
Interstate Maintenance	\$8,623,472	\$8,762,366	\$8,903,496	\$9,046,898
National Highway System	\$44,671,377	\$45,390,197	\$46,121,226	\$46,864,027
Surface Transportation Program	\$30,857,302	\$31,354,195	\$31,859,088	\$32,372,111
Bridge Replacement and Rehabilitation	\$21,205,138	\$21,546,692	\$21,893,747	\$22,246,380
Congestion Mitigation and Air Quality	\$8,364,628	\$8,499,317	\$8,636,175	\$8,775,237
Recreational Trails	\$764,160	\$819,406	\$874,652	\$929,898
Metropolitan Planning	\$1,448,969	\$1,472,634	\$1,496,045	\$1,519,833
Safety	\$5,079,050	\$5,178,547	\$5,279,645	\$5,382,372
Rail Highway Crossings	\$1,100,000	\$1,100,000	\$1,100,000	\$1,100,000
Safe Routes to School	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
High-priority Projects	\$25,120,000	\$25,120,000	\$25,120,000	\$25,120,000
Equity Bonus	\$19,276,425	\$18,686,749	\$18,065,609	\$17,412,499
Total	\$167,510,521	\$168,930,103	\$170,349,683	\$171,769,255

Source: HDOT, 2010

Exhibit 11 presents combined federal and state revenues for 2008 and 2009. Total revenues for 2008 were approximately \$383 million. State revenues accounted for nearly 56 percent of total revenues. 2009 revenues decreased to approximately \$368 million with state revenues representing 53 percent of the total.

EXHIBIT 11

Total State and Federal Revenues, 2008-2009



Source: HDOT, 2010

Summary

This memorandum presents information about Highways Division priorities at the state and district levels as of September 2010 through summaries of implemented and planned Program fund allocations. It includes historical and projected funding by program and by district, thus providing information that can be used as a tool to assess mid- and long-term funding needs, as shown in the FFY 2011-2014 STIP. Comparisons are provided that illustrate the differences between past and proposed future funding priorities.

Statewide, the STIP as of September 2010 is projecting a relative increase in funding for the Congestion and Safety Programs and a relative decrease in funding for the System Preservation and Capacity Programs. By District, the proportion of funding allocated to the Hawaii District is projected to increase, the proportion allocated to the Maui District is projected to decrease, and the proportions allocated to the Oahu and Kauai Districts are projected to remain relatively similar to the recent past.

The HDOT Highways Program is funded by both state and federal sources. In 2008 and 2009, State revenues accounted for nearly 56 percent and 53 percent of total revenues, respectively, with the remainder coming from federal sources.

Fuel taxes are the largest source of state funding accounting for 41 percent of revenues in 2008. Over 84 percent of federal funds come from five programs: National Highway System, Surface Transportation, Bridge Replacement and Rehabilitation, High Priority Projects, and Equity Bonus.

In the future, highway program funding is expected to remain flat because of the economic recession's impact on state and federal taxes and fees.

Reference

State of Hawaii Department of Transportation (HDOT). 2010. *2035 Hawaii Statewide Transportation Plan: Issue Paper on Financial Issues*. June.



Appendix H

Future Funding Strategies

Statewide and Regional Federal-Aid Highways 2035 Transportation Plans for the Districts of Maui, Hawaii, and Kauai

Future Funding Strategies

PREPARED FOR: State of Hawaii Department of Transportation
PREPARED BY: CH2M HILL
DATE: March 2014

Introduction

As part of the State of Hawaii Department of Transportation (HDOT) Statewide Transportation Planning Process, policy and planning activities must be coordinated with funding and implementation activities. The purpose of this memorandum is to present a summary of the funding needs for the State of Hawaii's Highway Fund by outlining long-term program costs through 2035. This memorandum will also identify current and future sources of revenue for the Highway Fund at the statewide and federal level and discuss potential funding shortfalls. Finally, the memorandum will identify funding strategies to meet anticipated needs and provide a discussion of possible contingency measures to mitigate funding gaps.

Current Funding Summary

In August 2011, the Expenditure and Funding Summary Technical Memorandum was prepared to illustrate the HDOT Highways Division priorities through summaries of historic implemented/planned program fund allocation. A review of the Statewide Transportation Improvement Program (STIP) project list as of June 2010 was used during the analysis. It should be noted that the STIP has been revised since the completion of the August 2011 memo to reflect the current status of listed projects.

The historic fund allocation summaries were used as a tool for understanding potential mid- and long-term funding needs, but were not intended to be used to forecast funding trends. The memorandum summarized the short-term historical and projected expenditures by program at the statewide and district levels. Historical data were presented for federal fiscal years (FFY) 2006-2009, and short-term projected expenditures were presented for FFY 2011-2014.

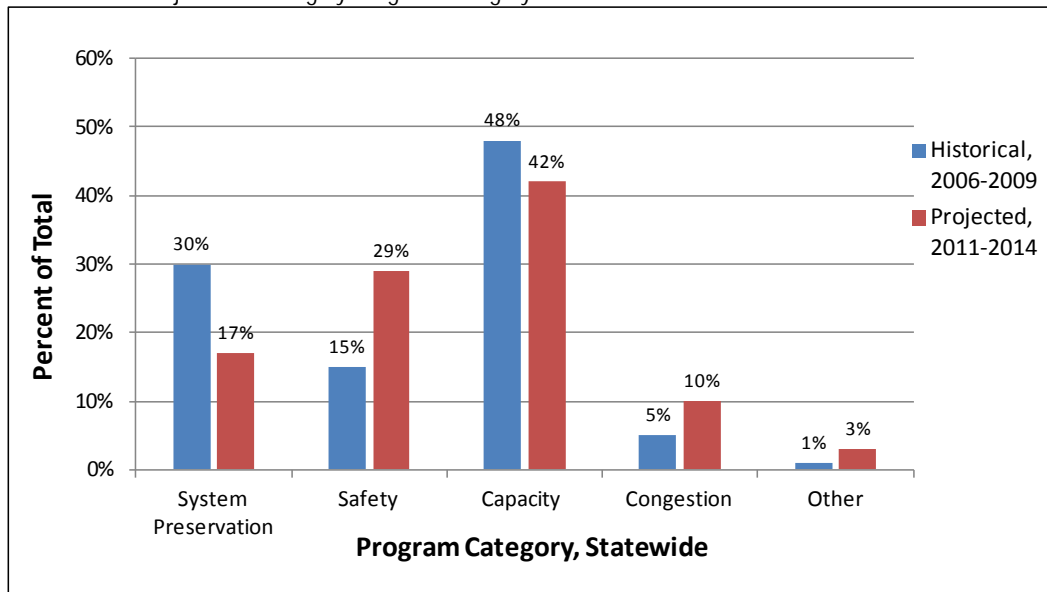
Historical revenue was also summarized to identify the level of contribution for various state and federal revenues that fund the HDOT Highways Division's programs. Land transportation projects are implemented through one of the following overarching HDOT Highways programs:

- **System Preservation Program** - provides regular maintenance, rehabilitation, reconstruction and replacement of transportation facilities to maintain the overall operations of the transportation system.
- **Capacity Program** - provides support to address identified capacity needs for all modes of land transportation, from widening existing facilities to constructing new facilities.

- **Congestion Program** - manages and optimizes performance of current infrastructure to improve mobility, reliability, and predictability of travel within the existing transportation system.
- **Safety Program** - provides education, and roadway and roadside infrastructure improvements that reduce the severity and number of crashes. The Safety Program also focuses on upgrading existing transportation infrastructure to current environmental and safety requirements through industry best practices.
- **Other** - captures improvements to HDOT Highways Division’s facilities, right-of-way closeout costs, the Highways Planning Program, and staff labor.
- **Environmental Program** - manages the stormwater runoff permit conditions defined by the United States Environmental Protection Agency. Landscaping and related roadside environment best practices are also provided through this program.

Figure 1 compares historical and projected funding for each of the HDOT Highways Division’s programs at the statewide level, as of 2011. On a percentage basis, the FFY 2011-2014 STIP indicates decreased funding for the System Preservation and Capacity programs and increased funding for the Congestion and Safety programs compared to FFY 2006-2009. The Environmental Program was established after 2009; therefore, no historical financial data for this program in FFY 2006-2009 are available.

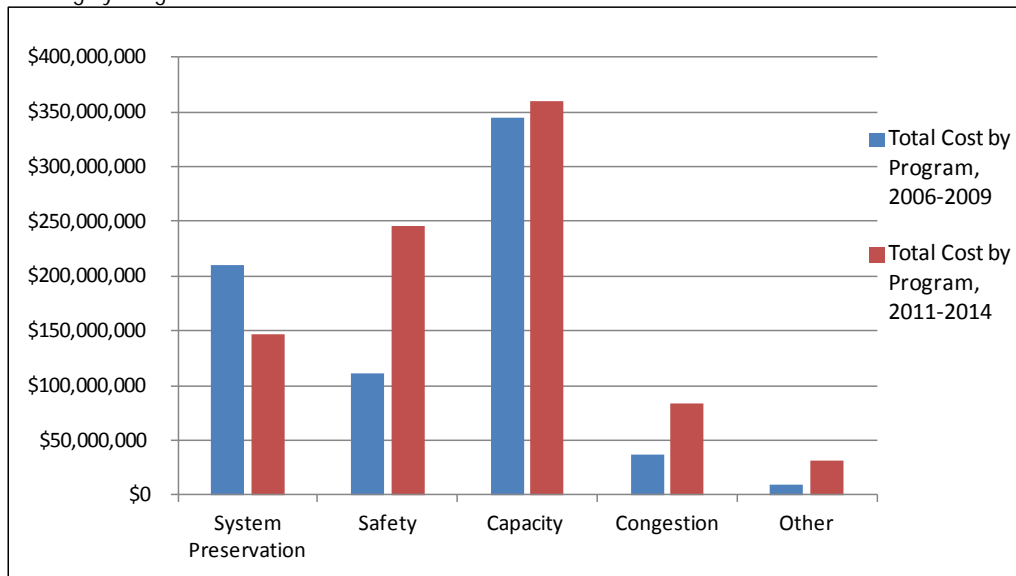
FIGURE 1
Historical and Projected Funding by Program Category: Statewide



Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log. *FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program* September 1, 2010.

Figure 2 compares historical and projected short-term future funding, in dollars, by program. As shown, the Capacity Program received more funding than any other program with nearly \$350 million in funding. Short-term projected funding for the Capacity Program is expected to remain similar to FFY 2006-2009. Compared to FFY 2006-2009, the FFY 2011-2014 STIP shows increased focus on the Safety Program and the Congestion Program, with a drop in funding for the System Preservation Program.

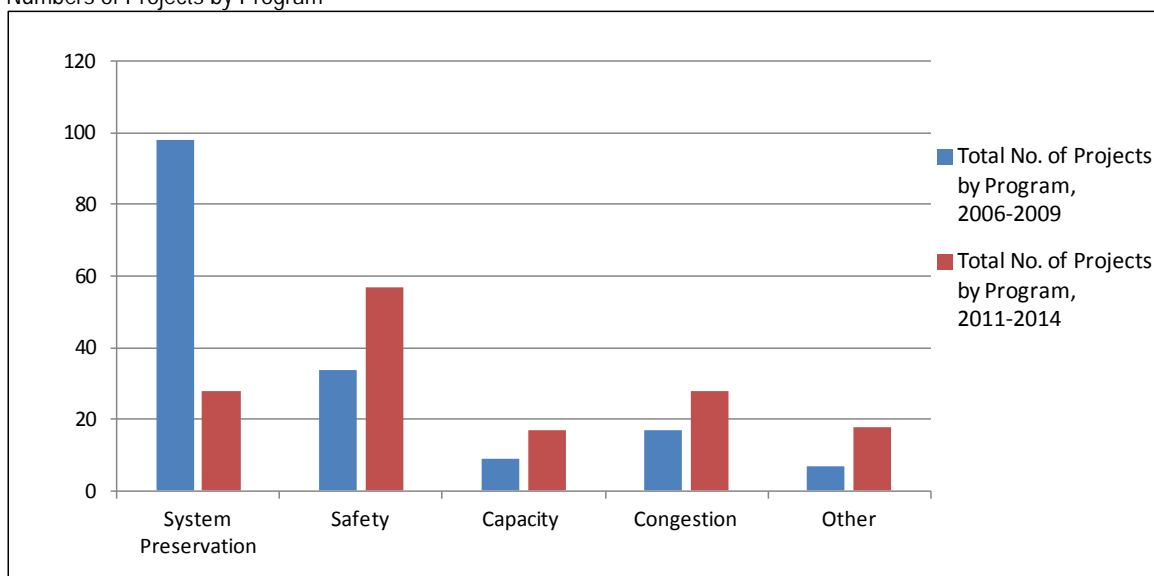
FIGURE 2
Funding by Program



Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log. FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

Figure 3 shows a summary of the number of funded projects under each program for FFY 2006-2009 and FFY 2011-2014. A total of 165 projects were programmed in FFY 2006-2009. Nearly 100 projects were programmed into the System Preservation Program. A total of 148 projects were programmed in FFY 2011-2014. The Safety Program has the largest increase in the number of projects programmed in FFY 2011-2014 compared to FFY 2006-2009. The STIP shows an increased number of projects in all program categories except System Preservation. However, the number and amount of funding for capacity projects will likely decrease due to the adoption of Moving Ahead for Progress in the 21st Century (MAP-21) in July 2012, which contains no earmarked funds.

FIGURE 3
Numbers of Projects by Program



Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log. FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

Funding Needs

In the future, the resources required to address projected statewide land transportation needs are expected to exceed the available funds. By the year 2035, the estimated cost to address identified transportation needs would be over \$30 billion (2011 dollars). With anticipated available funds of approximately \$7.01 billion through 2035, the state is likely to experience a funding shortfall.

Land Transportation Needs

Future needs and deficiencies of the statewide land transportation system were identified during the development of the *Statewide Federal-Aid Highways 2035 Transportation Plan* (HDOT, 2014). Relevant plans, policies, and programs were reviewed, and future projected land use and socioeconomic conditions were evaluated to identify where poor operations could occur. Stakeholders also provided information on programmatic transportation system needs.

At the commencement of the planning process, documented statewide transportation needs and deficiencies were identified and compiled during a review of relevant plans and policies. Relevant sources included the *Hawaii Statewide Transportation Plan* (2011), *Bike Plan Hawaii* (2003), *Statewide Pedestrian Master Plan* (2013), and the *Hawaii Strategic Highway Safety Plan* (2007-2012).

Vehicular volumes in all regions are anticipated to grow as land uses are developed and population and employment opportunities increase. Increases in traffic would result in greater demand on the state's roadway infrastructure and higher levels of congestion compared with existing conditions. Forecasted travel times between communities would increase, and vehicles could experience long delays in the future. Because roadways are used by cars, freight, transit, bicyclists, and pedestrians, the increased congestion would affect all modes. Roadways that are not expected to be able to accommodate future traffic volumes were identified as transportation deficiencies.

These needs and deficiencies were supplemented through facilitated discussions with stakeholder groups representing various cross-sections of the community. These facilitated discussions captured agency and user perspectives of statewide land transportation system operations. Recurring regional needs and comprehensive statewide land transportation needs were summarized as an initial step in development of potential programmatic statewide solutions.

Identified statewide transportation system needs and deficiencies included:

- **Preserving and maintaining continuous highway operations** - Address issues related to slope erosion and stabilization, rockfall hazards, shoreline erosion, drainage and flooding, and roadside vegetation.
- **Improving capacity and safety of nonmotorized modes** - Evaluate need for more bicycle lanes, shared-use paths, sidewalks, and trails, and improve integration between nonmotorized and motorized modes.
- **Providing emergency access/egress to communities** - Maintain traffic operations for communities that are separated by geographic features and rely on a single roadway for access.

- **Improving and expanding transit service** – Evaluate need for more transit routes, new service areas, improved infrastructure, and more amenities.
- **Addressing congestion** – Develop strategies to reduce congestion for all modes on state roadways.

Potential Solutions

Based on the identified needs, regional project solutions and statewide programmatic solutions were developed. Programmatic solutions involved changes or improvements to address overarching system needs. These solutions would affect more than just a specific roadway facility or location; programmatic solutions have an impact statewide.

These potential solutions would be implemented through the overarching HDOT Highways Division’s programs (System Preservation, Capacity, Congestion, and Safety) or through existing county programs. Both the state and the counties have processes to first prioritize and then implement solutions. Figure 4 shows the correlation between potential solutions that address the identified statewide needs, and the HDOT Highways Division’s program(s) that would implement the solution.

FIGURE 4
Statewide Needs and Potential Solutions by Program

Statewide Need	Potential Programmatic Solutions	Program(s) Implemented Through
Preserve and maintain continuous highway operations	<ul style="list-style-type: none"> • Perform regular maintenance on roads and bridge • Remove roadside vegetation • Install erosion control and slope stabilization • Improve drainage facilities • Replace highway lighting • Repair bicycle lanes and sidewalks 	System Preservation
Improve capacity and safety of nonmotorized modes	<ul style="list-style-type: none"> • Encourage Complete Streets • Construct new bicycle lanes and sidewalks • Provide lights, pavements markers, signage 	Capacity, Safety
Provide emergency access and improve resiliency	<ul style="list-style-type: none"> • Construct alternate routes or bypass roads • Reinforce critical lifeline facilities • Relocate roads away from shoreline 	Capacity
Improve and expand transit service	<ul style="list-style-type: none"> • Increase frequency of routes • Introduce service to new areas • Create transit connections to key transportation hubs • Enhance transit amenities 	Regional Transit Authorities
Address and reduce congestion	<ul style="list-style-type: none"> • Consider transit-only lanes or high occupancy vehicle lanes • Explore peak-hour, directional traffic control • Implement Intelligent Transportation System technologies 	Congestion

Cost estimates were developed for potential solutions based on conceptual drawings, preliminary project descriptions, bid tabulations, typical contingencies, and average construction costs per vehicular lane mile. Based on preliminary estimates, the cost to implement potential solutions and address statewide programmatic needs was approximately

\$30 billion. Figure 5 shows that each of the districts had different transportation deficiencies and therefore different program funding needs.

FIGURE 5
Estimated Costs of Program Needs, by District

HDOT Highways Program	Oahu^a	Maui	Hawaii	Kauai
System Preservation		\$406 M	\$1.1 B	\$315 M
Safety		\$680 M	\$960 M	\$595 M
Capacity		\$1.9 B	\$4.1 B	\$2.2 B
Congestion		\$60 M	\$405 M	\$57 M
Other		\$60 M	\$795 M	\$10 M
Total = \$30.4 B	\$16.7 B	\$3.1 B	\$7.4 B	\$3.2 B

^a Source: Oahu Metropolitan Planning Organization, 2011.

Inflation

Per the HDOT memo (HWY-PS 2.6454) dated December 8, 2007, inflation must be used when developing financial plans that include projects funded by federal dollars in the STIP. The HDOT developed a methodology that used the average inflation rate as reported by Consumer Price Index (CPI) data to estimate a constant inflation rate for all financial planning. Based on the average inflation rate from 2003-2006 as shown in the memo, a constant inflation rate of 4.0 percent (rounded) per year was calculated. The HDOT Highways Staff Services Office is responsible for validating and updating the inflation rate each budget cycle.

Figure 6 presents the inflation rate derived from the HDOT methodology presented in HDOT memo HWY-PS 2.6454.

FIGURE 6
HDOT Project Inflation Factor (2003-2006)

Year	Honolulu Index	% Change
2003	184.0	
2004	188.9	2.7%
2005	195.6	3.5%
2006	201.6	3.2%
Average Difference		3.1%
Rounded Up		4.0%

Source: HDOT, 2007

Based on a review of more recent CPI data for Honolulu, Figure 7 shows an inflation rate of 3.0 percent (rounded) for data between 2008 and 2011.

FIGURE 7
Projected Inflation Factor (2008-2011)

Year	Honolulu Index	% Change
2008	228.9	
2009	230.0	0.5%
2010	234.9	3.1%
2011	243.6	2.7%
Average Difference		2.1%
Rounded Up		3.0%

Source: United States Department of Labor, Bureau of Labor Statistics, 2012a.

Projecting inflation is an imperfect science, and as an alternative approach to the current HDOT methodology, a longer history of CPI data were reviewed to calculate inflation factors. Looking further back than the most recent four years ensured that the inflation factor was not calculated based on recent booms or busts in the economy, which would cause factors that were too high or too low depending on where the economy was in the cycle.

Reviewing the past 30 years of CPI data for Honolulu (1982 through 2011) provided a similar rate of inflation when compared to the previous four years of data (2008 through 2011). Figure 8 presents the average annual inflation rate for Honolulu and the United States from 1982 to 2011. The national rate averaged approximately 3.0 percent per year over the 30 year time period while the local rate of inflation was slightly higher at 3.3 percent per year.

FIGURE 8
Average 30-year Consumer Price Index

Year	Honolulu Index	United States Index
1982	97.2	97.7
2011	243.6	227.0
Average Annual Change	3.3%	3.0%

Source: United States Department of Labor, Bureau of Labor Statistics, 2012a-b.

An additional method to estimating inflation was to look at inflation factors developed by a third party that specializes in economic forecasting and analysis, such as IHS Global Insight. IHS Global Insight provides construction labor and pricing forecasts for the United States. As the CPI for Honolulu and the nation tracked fairly closely over the past 30 years, the inflation factors from IHS Global Insight served as a guide for estimating inflationary trends statewide.

Figure 9 presents historical and projected inflation for the United States based on data analyzed by IHS Global Insight in the second quarter of 2012. Inflation for the period between 2009 and 2011 averaged about 1.7 percent while projected inflation for 2011-2014 was estimated at 3.9 percent.

FIGURE 9
Inflation Rates

Time Period	Average Annual Inflation Rate
2009-2011	1.7%
2011-2014	3.9%

Source: IHS Global Insight

The historical average of 1.7 percent from 2009 to 2011 was relatively consistent with the inflation rate experienced in Honolulu from 2008 to 2011 (2.1 percent) over a similar time period (see Figure 7). The inflation forecasts from IHS Global Insight indicated that inflation was closer to 4 percent over the near future as labor and construction prices were expected to rise. Based on the various inflation factor calculations, a constant inflation rate of 4 percent per year was assumed to be conservative and was applied to the estimated costs of projected statewide needs.

Sources of Future Funding

The HDOT Highways Programs rely on funding from state and federal sources to maintain and enhance transportation facilities. Through 2035, the HDOT Highways Division could expect to receive funds totaling approximately \$7.01 billion.

Federal Funding

Federal funding is received for the maintenance and construction of the federal highway system and for major arterials and collectors that feed into the highway system. Figure 10 presents the annual federal funding received from 2002 through 2011. Over that period, federal funding ranged from \$82 million in 2004 to \$217 million in 2009. The average amount of federal dollars received each year for the past 10 years was approximately \$152 million annually.

FIGURE 10
Historical Highway Federal Funds, FFY 2002-2011

Fiscal Year	Interstate	Other	Total Amount Reimbursed
2002	\$12,300,000	\$126,423,000	\$138,723,000
2003	\$12,653,000	\$119,428,000	\$132,082,000
2004	\$4,089,000	\$78,449,000	\$82,538,000
2005	\$4,528,000	\$153,676,000	\$158,204,000
2006	\$8,052,000	\$112,461,000	\$120,513,000
2007	\$14,222,000	\$103,783,000	\$118,006,000
2008	\$8,410,000	\$183,929,000	\$192,340,000
2009	\$16,886,000	\$200,118,000	\$217,003,000
2010	\$10,771,000	\$175,714,000	\$186,485,000
2011	\$14,116,000	\$166,164,000	\$180,279,000
Average	\$10,603,000	\$142,015,000	\$152,617,000

Source: HDOT, 2012a

Current federal transportation legislation, MAP-21, was adopted in July 2012. It is a long-term highway authorization act and guides transportation policy at the federal level. It includes funding for fiscal years 2013 and 2014, and outlines national goals and transportation performance targets. Beyond 2014, the amount of future federal dollars to be received for the highway system in Hawaii is unknown; therefore, to present a more conservative estimate of future funds, the projected average annual amount of federal funding was assumed to be approximately equal to the average amount received over the past 10 years. This estimated amount was held constant through 2035.

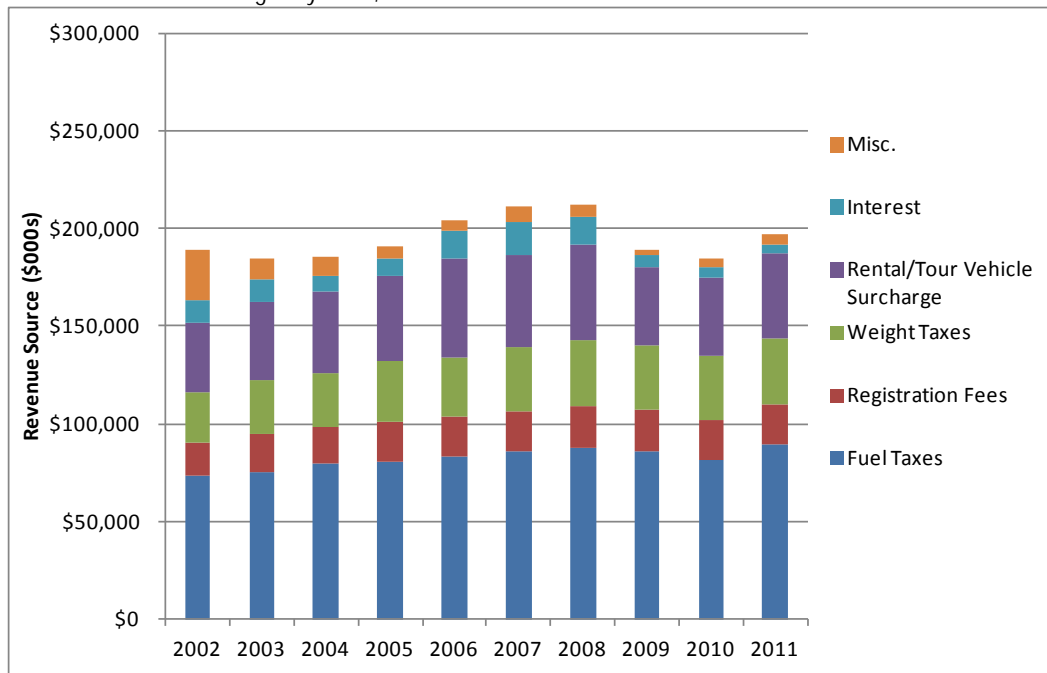
State Funding

Historical and projected sources of state funds were obtained from the HDOT annual reports and the 2011 Highway Fund Revenue Bond Official Statement (HDOT, 2012b). Sources of pledged state funding include vehicle surcharges, registration fees, vehicle weight taxes, fuel tax, investment earning, and miscellaneous income. Each major source of revenue is discussed below:

- **Highway Fuel License Tax** – Currently, the highway fuel tax is \$0.17 per gallon of gasoline and diesel oil for highway use and \$0.02 per gallon of gasoline, diesel oil, and liquid petroleum gas for non-highway use. The fuel taxes are collected by the Department of Taxation and transferred to the State Highway Fund. In FFY 2011, the highway fuel tax contributed approximately \$89.0 million to the State Highway Fund.
- **Vehicle Registration Fees** – The State vehicle registration fee increased from \$25 per vehicle to \$45 per vehicle in 2011. In FFY 2011, the registration fees contributed approximately \$20.8 million to the State Highway Fund.
- **Weight Taxes** – All vehicles, including motor vehicles, are assessed an annual State vehicle weight tax. The tax increased in 2011 to \$0.0175 per pound. The maximum charge for a vehicle increased to \$300 per vehicle. The additional weight tax is expected to result in an increase in net revenues of nearly \$33.0 million in FFY 2013. In FFY 2011, weight taxes contributed approximately \$33.4 million in revenues to the State Highway Fund.
- **Rental/Tour Vehicle Surcharge** – The rental/tour vehicle surcharge imposes a daily tax on the rental of all motor vehicles and tour vehicles. In FFY 2011, the rental and tour vehicle surcharge contributed approximately \$43.9 million to the State Highway Fund.
- **Interest** – This is income derived from the investment of Highway Special fund money held by the State. In FFY 2011, interest income was approximately \$4.0 million.
- **Miscellaneous** – Miscellaneous revenues include permit fees, driver license fees, inspection fees, rental fees, and other miscellaneous revenues.

Figure 11 presents historical revenues for the State Highway Fund from FFY 2002 through FFY 2011. Total revenues ranged from approximately \$185 million in FFY 2003 to approximately \$212 million in FFY 2008. In 2011, the HDOT highways reported operating revenue of approximately \$197 million. Fuel taxes, weight taxes, and rental vehicle surcharges were the three largest contributors of revenue each year.

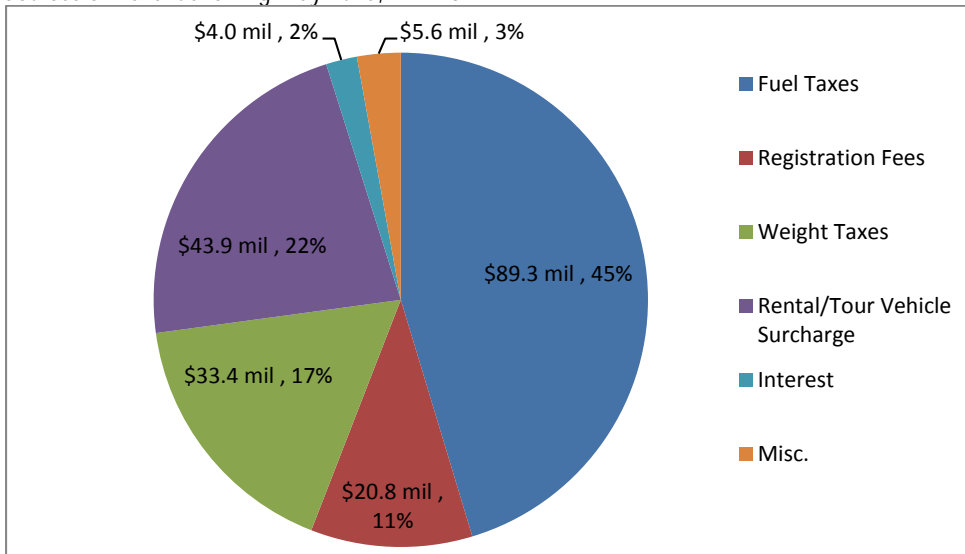
FIGURE 11
Historical Revenues for Highway Fund, FFY 2002-2011



Source: HDOT, 2012a

Figure 12 presents the breakdown of revenues by source for FFY 2011. Fuel taxes accounted for 45 percent of total revenues while the rental vehicle surcharge accounted for 22 percent of the total.

FIGURE 12
Sources of Revenue for Highway Fund, FFY 2011



Source: HDOT, 2012a

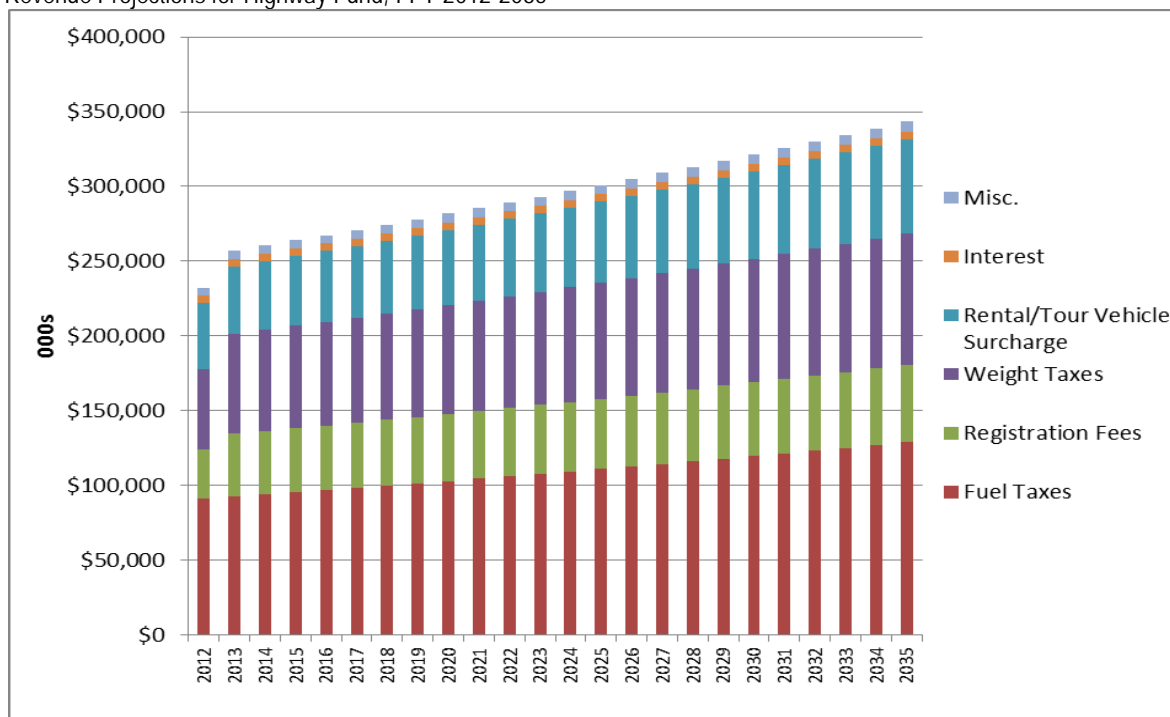
Figure 13 presents projected revenues from state sources from 2012 through 2035. Compared to the operating revenue of just under \$200 million in 2011, revenues increased in 2012 to approximately \$232 million. This was due to an increase in the weight tax, which generated

approximately \$20 million in additional revenue, and an increase in registration fees, which generated approximately \$12 million in additional revenue.

Forecasted revenues are expected to increase from \$232 million in 2012 to nearly \$350 million in 2035. This includes revenue of approximately \$23 million between 2012 and 2013 from the increase in weight tax and registrations fees. The delay in the realization of the additional revenues is because of the implementation schedule and the lag between the collection of the fees by the counties and the transfer of money to the State Highway Fund.

For projection purposes, all revenues were expected to grow on an annual basis of approximately 1.3 percent per year. This growth rate is consistent with growth rates presented in the 2011 Highway Revenue Bonds Official Statement (HDOT, 2012b).

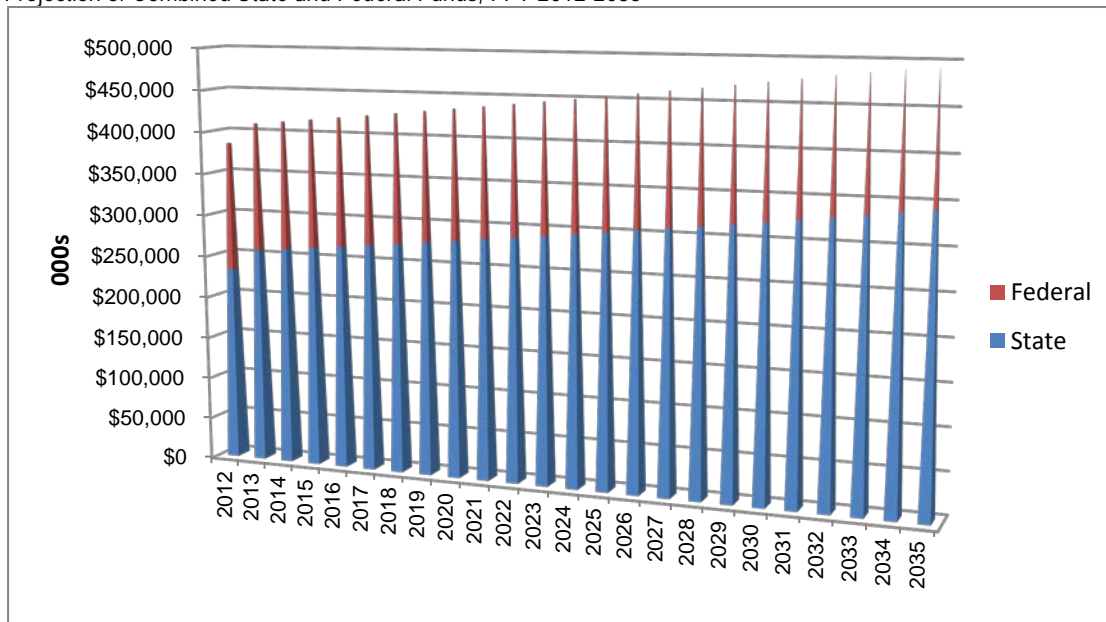
FIGURE 13
Revenue Projections for Highway Fund, FFY 2012-2035



Source: Official Statement, State of Hawaii Highway Revenue Bonds, Series 2011B; CH2M HILL estimate

Figure 14 presets the estimated combined funding from state and federal sources from 2012 through 2035. Funding is expected to grow from approximately \$385 million in 2012 to nearly \$495 million in 2035. Growth in funding dollars is assumed to be from state generated revenue sources, as the federal fund contribution was assumed to be held constant. Assuming inflation, total available funding through 2035 is expected to be approximately \$7 billion (in 2011 dollars).

FIGURE 14
 Projection of Combined State and Federal Funds, FFY 2012-2035



Sources: HDOT, 2012a; CH2M HILL estimate

Future Funding Plan

The current funding outlook indicates a significant gap between estimated transportation needs (over \$30 billion) and future available funds (approximately \$7.01 billion). Based on historical trends this gap is not expected to close over time, and shortfalls in available dollars will continue to be a key factor in future planning.

Historically, approximately 51 percent of the annual HDOT Highway Division funds were distributed to the Oahu District. The Maui District received on average approximately 23 percent of the HDOT Highway Division funds, while the Hawaii District and the Kauai District received 17 percent and 9 percent, respectively. Assuming future distributions are consistent with past allocations, the expected revenue for each district is shown in Figure 15.

FIGURE 15
 Estimated Statewide Revenue and Need, by District

HDOT Highways District	Expected Revenue (\$B)	Estimated Need (\$B)	Funding Gap (\$B)
Oahu	\$3.6	\$16.7	(\$13.1)
Maui	\$1.6	\$3.1	(\$1.5)
Hawaii	\$1.2	\$7.4	(\$6.2)
Kauai	\$0.6	\$3.2	(\$2.6)
Total	\$7.0	\$30.4	(\$23.4)

The projected revenue is not likely to meet the estimated needs, and a significant funding gap is expected for each district. This situation is not unique to the state of Hawaii, and will require decision-makers to prioritize solutions to ensure effective use of limited funds.

The evaluation and prioritization processes used in the Statewide and Regional Federal-Aid Highways 2035 Transportation Plans look at the transportation system comprehensively and incorporate goals and values that were agreed upon at inception. It provides a strategy for moving forward with implementation, which will effectively use the funds available for addressing the needs of the transportation system. Key decision-makers continuing to use these processes should feel comfortable knowing that the community's values are being represented in the program priorities. According to past program distributions and the plans' goal-weighting priorities, the limited statewide funding will likely be distributed to the HDOT Highways Programs as shown in Figure 16. This distribution is based on needs and is consistent with MAP-21 federal legislation. MAP-21 guidance is largely focused on improving or enhancing current assets, and preserving and maintaining the condition of existing infrastructure. The majority of MAP-21 federal highway funds are dedicated to strengthening federal-aid highways through preservation and improvement.

FIGURE 16
Future Funding Distribution, by Program

HDOT Highways Program	Expected Distribution
System Preservation	45%
Safety	18%
Capacity	25%
Congestion	10%
Other	2%
TOTAL	100%

Funding Strategies

State and federal funding sources have not kept up with the demands of the highway transportation system. Unpredictability in funding sources for transportation projects makes it difficult for the state Highway Division to plan for future facilities. Delays to improvements in the transportation system leads to frustration among the taxpaying citizens who expect the highway infrastructure to keep up with the growing demand.

The fuel tax, which is the largest contributor to the state funding sources, is levied based on fuel consumption rather than value and is subject to volatility in consumption patterns. Consumption patterns can be impacted by improved vehicle efficiency and overall economic conditions. Other tax based revenue streams are subject to legislative approval and are not modified on a regular basis to keep pace with increasing needs and costs.

As shown in Figure 15, the state is not expected to have the funding available to implement all of the solutions needed to address deficiencies. A shortage of funding will likely mean the deferral of needed projects and may delay improvements to safety, congestion relief, and infrastructure preservation. The state will need to consider alternative revenue sources to meet the needs of the transportation system. In addition to current funding sources, other revenue sources that could be considered by the Legislature and other governing bodies include:

- **Mileage-based user fees** – Drivers pay a fee based on the number of miles traveled on public roadways. Private roadways would be excluded. Mileage could be tracked through various methods.
- **Tolls** – Drivers pay a fee each time a specific public roadway is used or a certain bridge is crossed. Toll fees may change based on the time of day. Tolling in Hawaii would require the Legislature to change the current laws that prohibit toll charges.
- **Special general excise tax on automotive parts and services** – Taxes would be collected through the performance of specific services (such as vehicle inspections or repairs) and the sale of equipment related to motorized vehicles.
- **General excise tax increase** – A portion of revenue from an increase in the general sales tax could be allocated to transportation improvements and projects.
- **Public/private partnerships** – An agreement between a private entity and a public agency to deliver transportation projects, typically with greater involvement and risk taken by the private entity.
- **Impact fees on new development** – Private developers pay a predetermined, per-vehicle fee based on the number of vehicle trips expected to be generated by the potential development.
- **Bicycle registration** – A bicycle licensing system could be developed, and user fees could be collected based on the type of bicycle registered. Fees could support maintenance and upkeep of bicycle lanes and shared roadways.
- **Carbon tax/cap** – A fee or tax could be imposed on producers of large amounts of carbon. These producers would pay a fee to “offset” their carbon production.
- **Increase current funding sources** – Because new sources of funding are difficult to identify, increasing the existing mechanisms – such as raising the rental/tour vehicle surcharge or vehicle weight tax – could generate additional revenue.
- **Grant anticipation borrowing** – This strategy allows public agencies to borrow against anticipated future federal and/or state revenues to fund capital projects that require large upfront expenditures. Existing programs include Grant Anticipation Revenue Vehicle bonds for highways and Grant Anticipation Note bonds for transit.
- **State infrastructure banks and other revolving loan funds** – These are lending organizations initially funded with federal grants and/or state funds and operated at the state level. These funds leverage federal and state resources by lending rather than granting federal-aid funds.
- **Bonds** – Bonds are issued by the state or other agency to finance assets with long useful lives (such as transportation projects). The administering entity issues bonds with a set return on investment, and investors purchase the bonds to help fund transportation projects. Bonds help smooth the impact of a large expensive projects by providing upfront capital, and allowing the state or county to repay over a set amount of time.
- **Land swaps and donated lands** – Right-of-way costs can be a large portion of total transportation project costs. Working with land owners to swap land for right-of-way or to donate land for a project could reduce project costs. Donated land value could also be used to leverage federal funds.

Reducing Funding Needs

Strategies to reduce funding needs could also be considered by the state to help minimize the future funding gap. By working with public and private entities to reduce the demand on the transportation system, potential needs could be reduced without investing directly into the transportation network. Strategies include:

- **Land Use Planning** – The demand for auto-based travel can be influenced through land use decisions and urban design. The development of denser, mixed-use areas could lead to greater travel options, and private auto use could decline when the environment is attractive to pedestrians, bicyclists, and transit users. Achieving land use changes requires zoning codes and regulations that allow for mixed uses and flexible design.
- **Transportation Demand Management** – Multiple strategies to help manage travel demand involve changing the mode of travel (usually from single-occupant, auto-based), the time of travel, or to remove the trip from the network altogether. Demand strategies include:
 - **Make bicycling attractive** – Require bicycle-friendly facilities, such as easily accessed and secure bike parking and storage, showers at destination locations (including employers), and other amenities.
 - **Make walking attractive** – Require sidewalks and pedestrian infrastructure such as mid-block crossings, pedestrian activated signals, and shaded routes. Change land use patterns or zoning codes to create more walkable districts and improve connectivity among pedestrian destinations.
 - **Make transit attractive** – Increase the number of transit routes, expand service hours, and shorten headways to improve the overall transit network. Create transit priority corridors to ensure transit is an attractive option to the single-occupancy vehicle.
 - **Make ridesharing attractive** – Implement education and ride-matching programs to increase the number of people per vehicle. Work with employers and high volume destinations to implement ridesharing programs through incentives such as preferential parking. Explore social media and mobile apps to facilitate connections between program participants.
 - **Change travel times** – Work with employers to implement flexible work schedules to reduce congestion during typical peak travel times.
 - **Reduce potential trips** – Work with employers to implement teleworking to reduce the amount of trips employees take to work.

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