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











Prepared for:
State of Hawaii
Department of Transportation
Highways Division

Maui Federal-Aid Highways 2035 Transportation Plan

Department of Transportation State of Hawaii

July 2014

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Prepared by

CH2MHILL®





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 Maui*, 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 Islands of Maui, Molokai, and Lanai. 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 Maui* 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,

Ford Fuchigami
Interim Director
State of Hawaii
Department of Transportation

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	fiscal year
GAN	Grant Anticipation Notice
GARVEE	Grant Anticipated Revenue Vehicle
HDOT	State of Hawaii Department of Transportation
LOS	Level of Service
MAP-21	Moving Ahead for Progress in the 21st Century
MDOT	County of Maui Department of Transportation
MPO	Metropolitan Planning Organization
OahuMPO	Oahu Metropolitan Planning Organization
PC	Policy Committee
Plan	Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui
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
VMT	vehicle miles traveled





Chapter I

Introduction and Overview

I. Introduction and Overview

The federal-aid highways are the backbone for moving people and goods around the Islands of Maui, Molokai, and Lanai. 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 islands so that their 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 the islands' 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 and is vital to a sustainable future. However, the resources required to address the projected land transportation needs for Maui, Molokai, Lanai, and for the state as a whole, far exceed the available funds. By 2035, the estimated cost to address identified transportation needs would be nearly $3.7 billion (2011 dollars). The Maui/Molokai/Lanai region is estimated to receive less than $1.6 billion in future state and federal funding, which would result in a funding shortfall of over $1.5 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 Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui (Plan) to incorporate technical input and community values and to guide decision makers in setting funding priorities.

This Plan is an update of the Maui Long-Range Land Transportation Plan developed in 1997 and will guide land transportation decisions for the federal-aid highway network on the Islands of Maui, Molokai, and Lanai through 2035. By defining goals and needs and recommending multimodal solutions specific to the region, 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 Maui, Molokai, and Lanai, it is a federal requirement as stated in Title 23, Sections 134 and 135 of the United States Code (USC). 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 community and county land use and transportation plans, policies, and programs to ensure it is consistent with the vision of communities on Maui, Molokai, and Lanai 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 modal integration and transit service (provide complete streets and promote safe, efficient modal connections).
- Maintain and improve safety for all modes.
- Preserve and maintain the existing transportation system.
- Promote resiliency and ability to respond to climate change.
- Support evacuation and emergency access/egress during incidents.
- Expand and increase regional economic vitality.
- Improve capacity and system efficiency by addressing congestion.

This Plan only applies to the ***federal-aid highways*** on Maui, Molokai, or Lanai. 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. These roads 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 below for the Island of Maui. There are no National Highway System roads on Molokai or Lanai.

- Route 30, Honoapiilani Highway between Main Street (Wailuku) and Front Street (Lahaina)
- Route 31 Piilani Highway between Mokulele Highway and 0.6 miles south of Wailea Ike Drive
- Route 32, West Main Street/Kaahumanu Avenue between High Street and Hobron Avenue
- Route 36, Hana Highway between Kaahumanu Avenue and Haleakala Highway
- Route 37, Haleakala Highway between Hana Highway and Kalialinui Bridge
- Route 311, Puunene Avenue/Mokulele Highway between Kuihelani Highway and Piilani Highway
- Route 380, Kuihelani Highway between Puunene Avenue and Honoapiilani Highway
- Route 3000, Lahaina Bypass between Honoapiilani Highway South junction to North junction
- Route 3500, Puunene Avenue between Kaahumanu Avenue and Kuihelani Highway
- Route 3800, Kahului Airport Access Road between Henaloa Street and Puunene Avenue
- Route 32A, Hobron Avenue between Hana Highway and Kahului Harbor
- Route 32B, Wharf Street between Kaahumanu Avenue and Harbors Division Pier 2



Exhibit 1-1. Federal Functional Classification

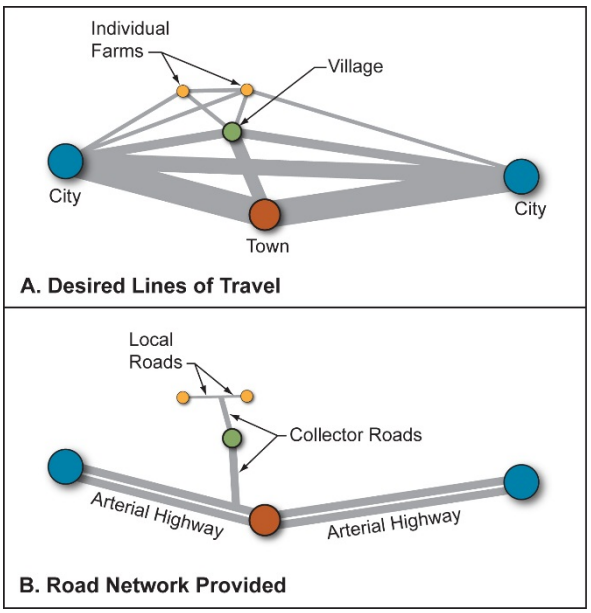
Functional classification uses a common nomenclature to provide a consistently defined roadway network across the country.

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 channelized 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 through 1-5 illustrate the highway functional classification on Maui, Molokai, and Lanai. Functional classification area map insets are included in Appendix A.

Exhibit 1-3. Highway Functional Classification Map of Maui

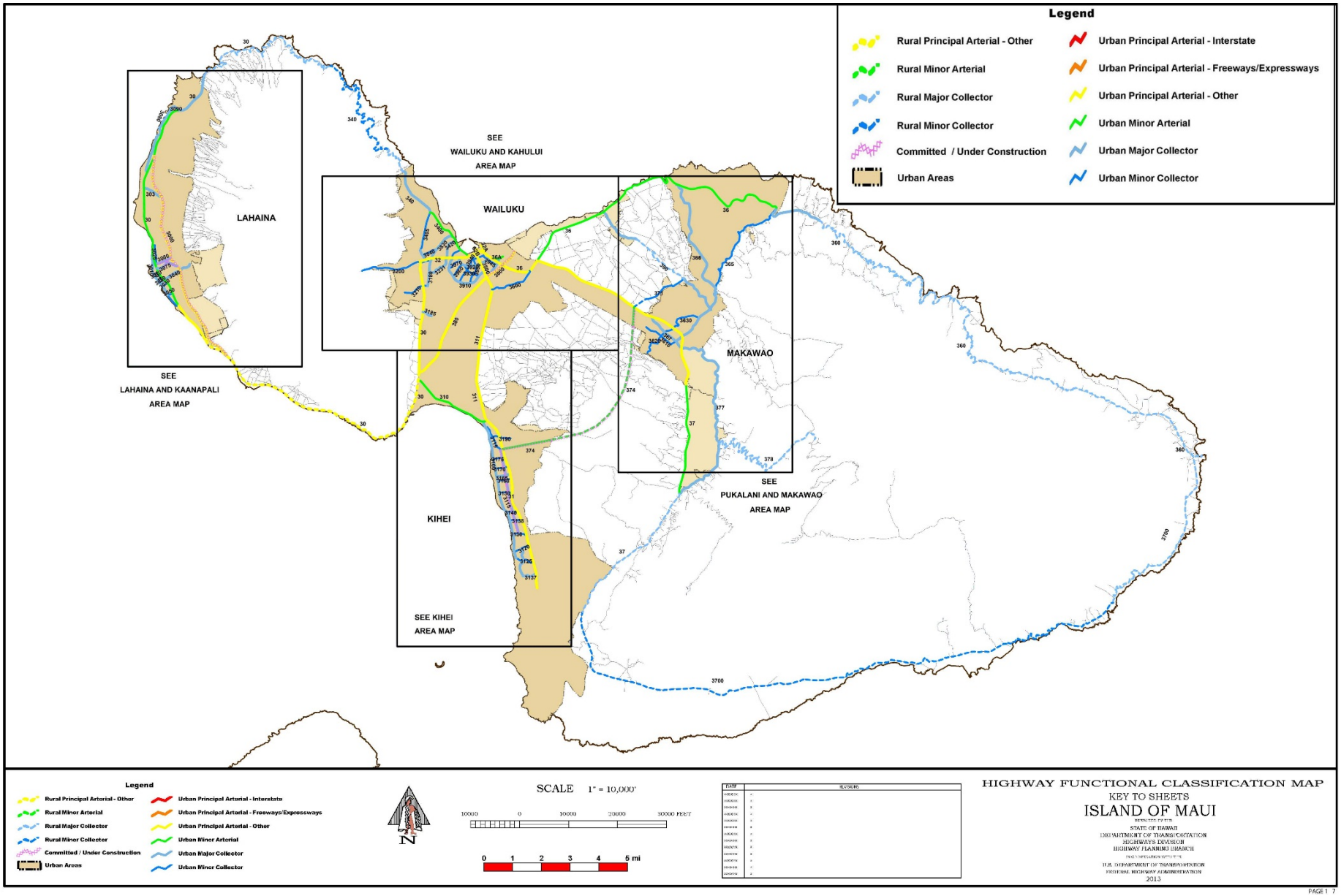


Exhibit 1-4. Highway Functional Classification Map of Molokai

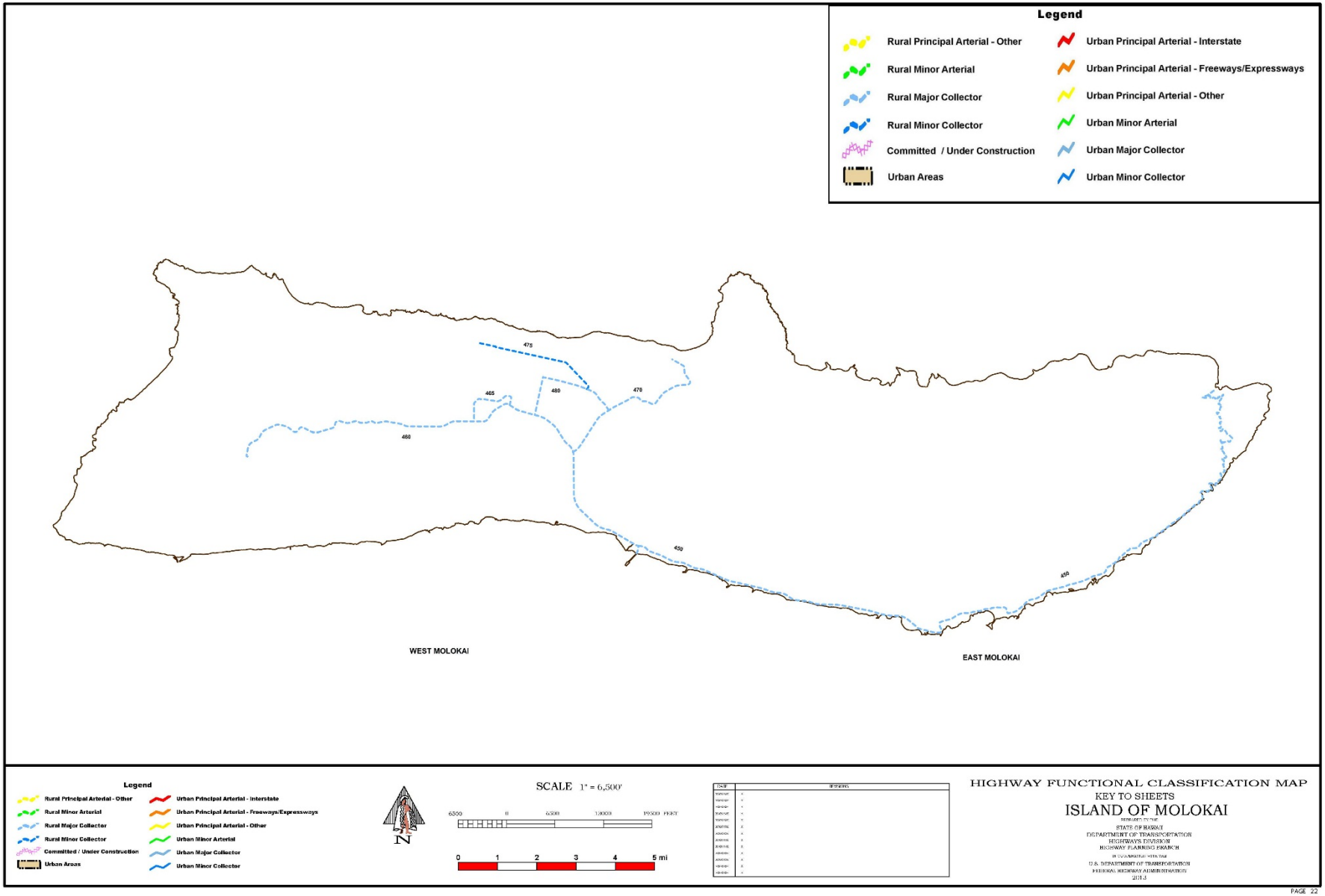
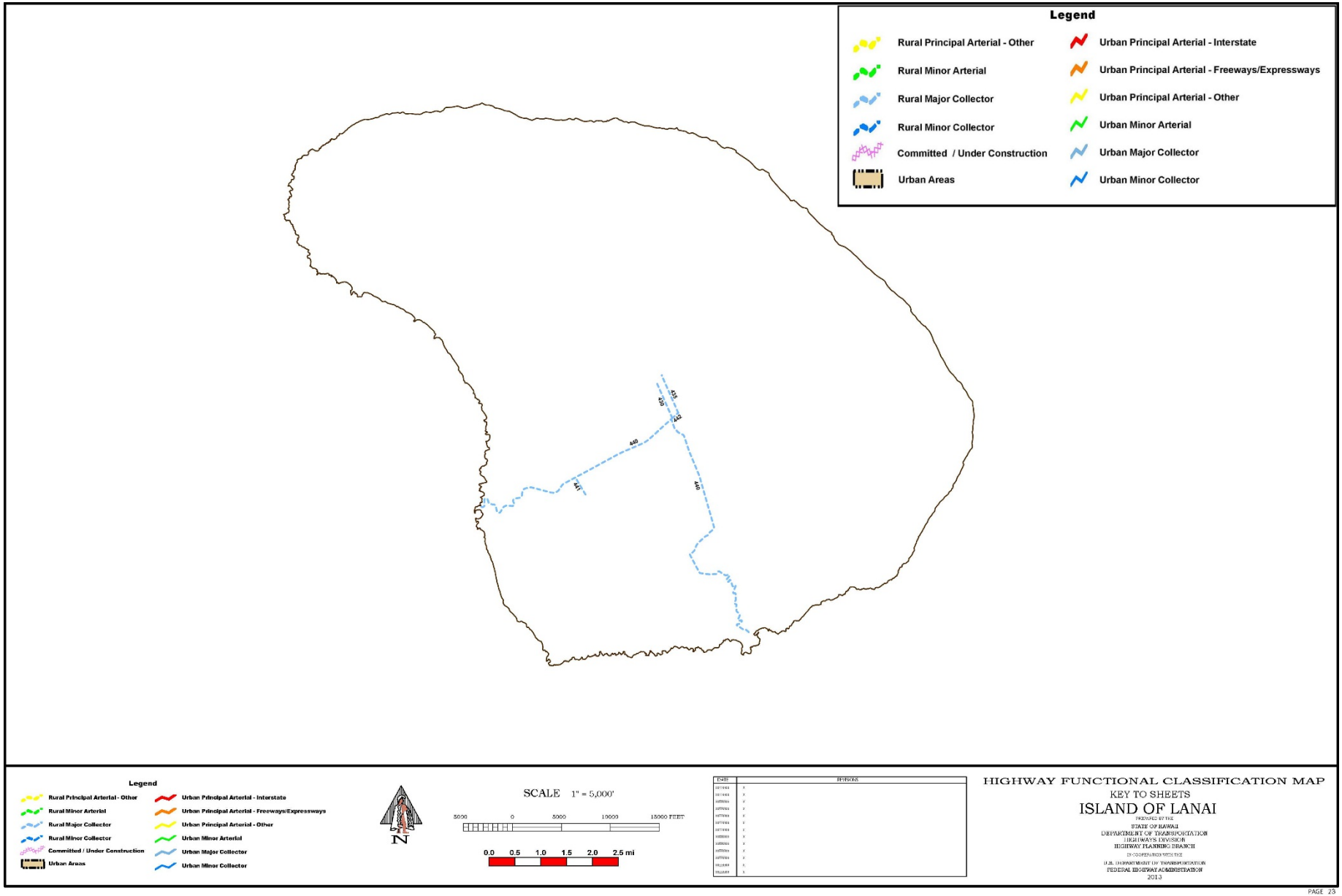


Exhibit 1-5. Highway Functional Classification Map of Lanai



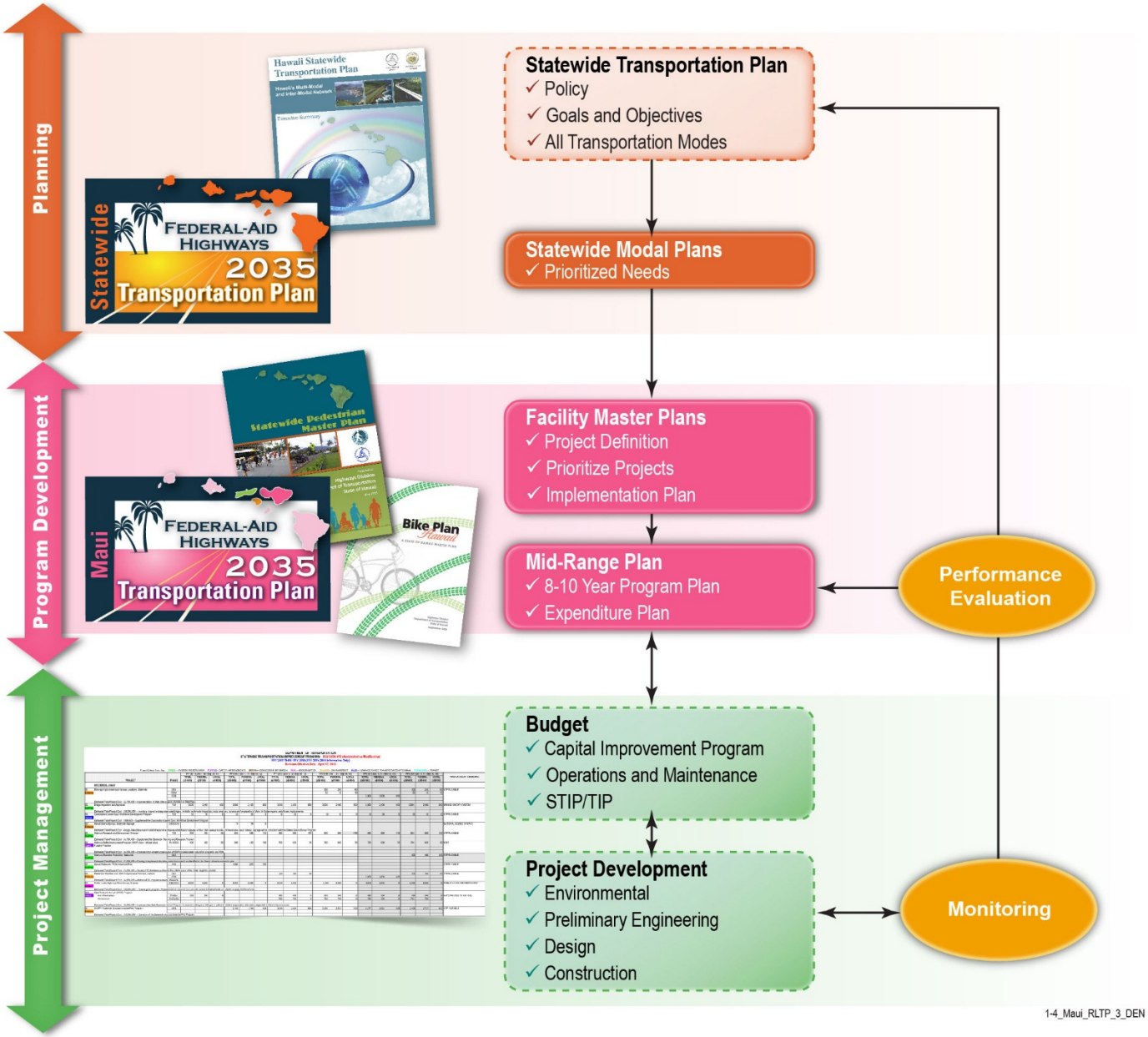
Relationship to Statewide Transportation Planning Process

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 long-range 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 statewide transportation planning process. A summary of the planning process and hierarchy of components is shown on Exhibit 1-6.

Exhibit 1-6. Statewide Integrated Transportation Planning



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 ensure 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* (pink 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.

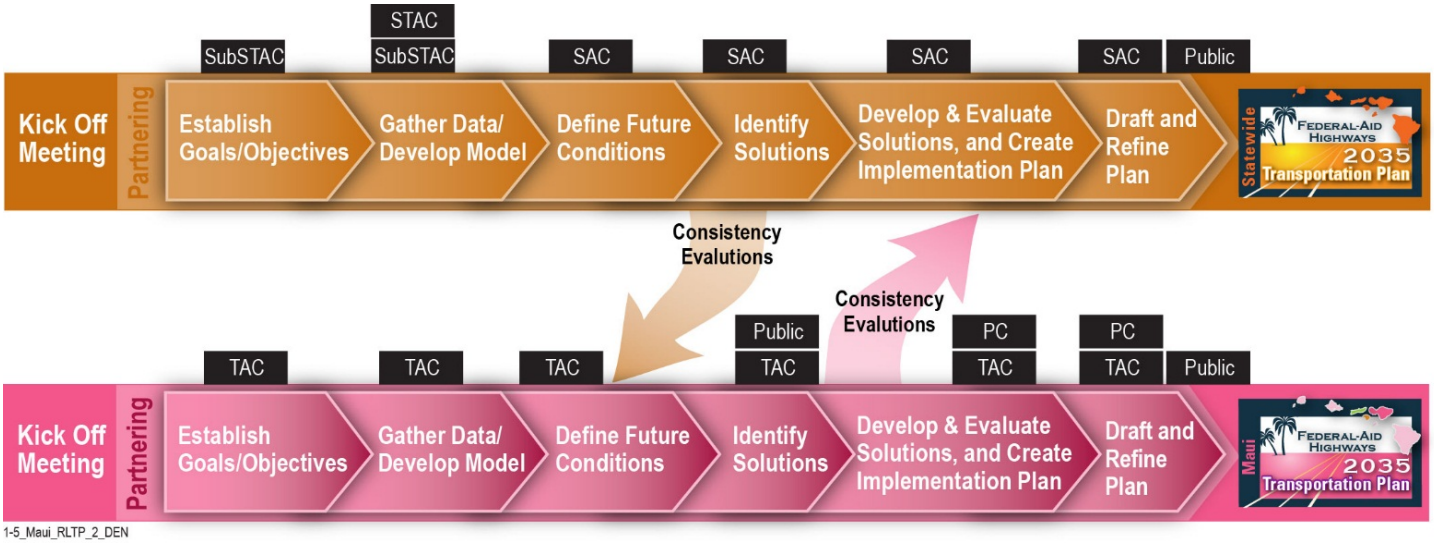
Plan Development Process

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 1-7.

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

Exhibit 1-7. Plan Development Process



1-5_Maui_RLTP_2_DEN

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.

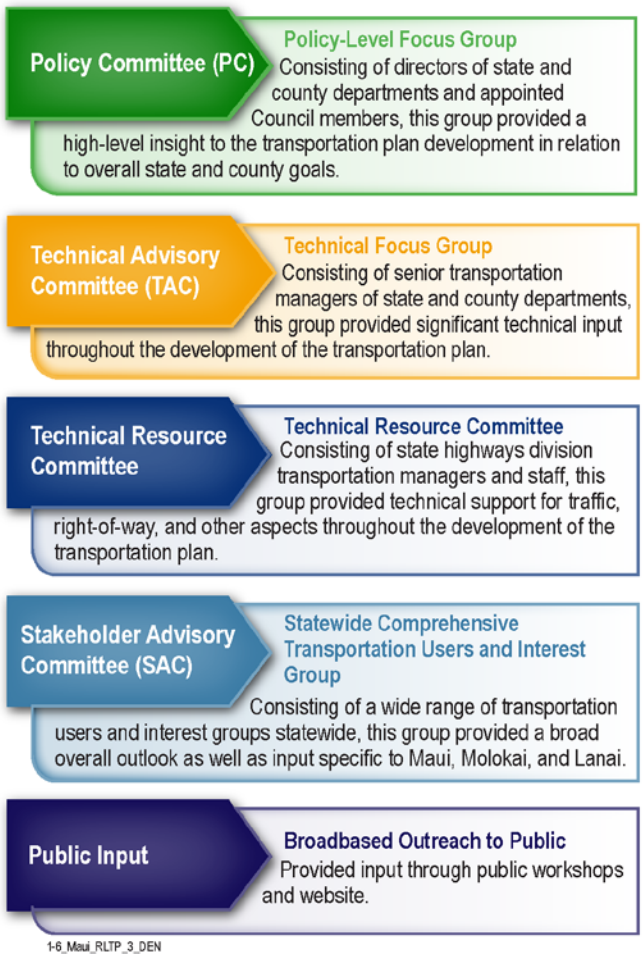
Develop and Evaluate Solutions and Create Implementation Plan – This milestone focused on evaluating the potential solutions against requirements and plan goals and objectives and creating implementation recommendations.

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.

Stakeholder Involvement

Stakeholder involvement was vital to the development of this Plan. Stakeholder groups 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 district Plan are described on Exhibit 1-8.

Exhibit 1-8. Stakeholder Groups, Roles, and Responsibilities



Stakeholder Groups

Policy Committee (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.



The general public provided input at the Maui Public Meeting held on February 21, 2012.



The Maui TAC met on July 26, 2010 to discuss their transportation concerns.

Technical Advisory Committee (TAC) – The TAC provided significant technical input throughout the development of the Plan. Membership consisted of senior managers from the HDOT and County of Maui departments. TAC member organizations are shown on Exhibit 1-9.

Exhibit 1-9. TAC Member Organizations

County of Maui
Department of Public Works
Planning Department
Department of Transportation (Transit)
Fire Department
Police Department
Civil Defense Agency
HDOT Highways Division
Maui District Office
Planning Branch

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 1-10.

Exhibit 1-10. 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 island through island-specific public involvement specialists.

Public Meetings – In addition to the comprehensive committee structure, the general public provided input to shape the Plan through two public workshops; one on February 21, 2012, to identify needs and opportunities in the transportation system, and one in April 2, 2014 to review the draft Plan.

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 Maui was developed concurrently with the Statewide Federal-Aid Highways 2035 Transportation Plan and the regional plans for the Districts of Hawaii 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 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was the current federal legislation. After formulation of the plan goals, Moving Ahead for Progress in the 21st Century (MAP-21) 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 USC 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 the development of goals and objectives.



Federal, state, and local plans were reviewed for consistency

According to federal requirements, urbanized areas with over 50,000 people need to create a Metropolitan Planning Organization (MPO), which is an agency that collects and distributes federal transportation funds for projects within the urbanized areas of the county. The 2010 US Census shows that Maui County exceeds this threshold. In response, the County's General Plan supports the establishment of an MPO. Applicable federal requirements call for the following:

- MPOs are required to establish and use a performance-based approach to transportation decision making and development of transportation plans
- Each MPO must establish performance targets that address the MAP-21 surface transportation measures

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

- Performance targets selected by an MPO must be coordinated with the state and public transportation providers to ensure consistency
- MPOs are required to integrate into the metropolitan transportation planning process other performance-based transportation plans or processes

This Plan has been developed in a manner consistent with federal planning processes and will remain useful once the Maui MPO is formed. The goals and objectives, transportation context and needs, and potential solutions will be relevant.

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 thorough summary of the plans, policies, and programs that were reviewed is included in Appendix B.

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

Federal Plans, Policies, and Programs	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. 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.	Other plans, policies, and programs examined include: » 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	» National Response Framework – US Department of Homeland Security » Bicycle Resolutions, 110th Congress U.S. Conference of Mayors
State Plans, Policies, and Programs	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.	» 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)	» 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	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.	» Maui Island Plan: General Plan 2030 (2012) » County of Maui General Plan 2030 – Countywide Policy Plan (2010) » Maui Long-Range Land Transportation Plan (1997) » County of Maui Multi-Hazard Mitigation Plan (2010 draft) » Community Plans: Hana (1994), Kaho'olawe (1995), Pa'ia-Ha'iku (1995), West Maui (1996), Makawao-Pukalani-Kula (1996), Kihei-Makena (1998), Lana'i (1998), Moloka'i(2001), and Wailuku-Kahului (2002) » Proposed Roadway Development Program (2007) » County of Maui Short Range Transit Plan (2005)	» Resolution No. 12-34 Complete Streets Policy (2012) » Final Environmental Impact Statement Honoapiilani Highway (FAP Route 30) Puamana to Honokowai (1990) » Kihei Traffic Master Plan (1996) » Joint State/County Maui Interim Transportation Plan (2002) » Update of a Regional Transportation Forecasting Model for the Island of Maui: Model Methodology and Calibration Report (2008) » County of Maui Fiscal Year Budget (2011, 2012, and 2013) » Land Use Forecast, Island of Lanai, Maui County General Plan (2012)

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. More detail of the planning factors and general criteria are described on Exhibit 2-2.

Stakeholder Input

For the regional and statewide plans, the TAC and SAC 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 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 Maui District

It was critical for the Plan to be specific to Maui, Molokai, and Lanai 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 Maui District, and how best to prioritize potential recommendations to meet these goals. Exhibit 2-3 shows the goals and priorities for Maui District that will help decision-makers determine programming priorities.

The Maui District TAC and SAC weighted the goals to reflect Maui District's 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 the district's specific land transportation system goals.



Exhibit 2-2. Planning Factors

Safety
Improve safety for users of all modes through engineering, education, and enforcement

Transportation Access Mobility
Provide transportation services and options accessible to all users. Improve services to underserved geographic areas and diverse populations.

System Efficiency Management & Operations
Manage current infrastructure and optimize performance by improving mobility, reliability, and predictability of travel within existing system.

Economic Vitality
Support planned, sustainable growth in residential, industry, tourism, and cultural and recreational opportunities by implementing solutions that reduce travel time and costs.



Environment and Sustainability
Develop sustainable and environmentally friendly transportation solutions that meet current and future needs. Solutions generally focus on promoting energy conservation, slowing the pace of climate change, and improving quality of life.

Modal Integration
Increase transportation mode choices and provide efficient and attractive connections between modes.

System Preservation
Schedule regular maintenance, rehabilitation, reconstruction, and replacement of transportation facilities, including multimodal facilities, to keep the overall transportation system operating safely and efficiently.

Security
Ensure secure operation of a land transportation system to support incident detection, response, clearance, and preparation for and recovery from disasters or threats.

As shown on Exhibit 2-3, the most important goals for the District of Maui, based on their higher relative weights as assigned by the stakeholders, are:

- Improve modal integration and transit service (provide complete streets and promote safe, efficient modal connections) – *Goal 2.1, Goal 2.2, Goal 2.3*
- Maintain and improve safety for all modes – *Goal 8.1*
- Preserve and maintain the existing transportation system – *Goal 3.2*
- Promote resiliency and ability to respond to climate change – *Goal 1.5*
- Support evacuation and emergency access/egress during incidents – *Goal 4.1*
- Expand and increase regional economic vitality – *Goal 5.1*
- Improve capacity and system efficiency by addressing congestion – *Goal 6.1*

Exhibit 2-3. Maui 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.	4%
		1.2	Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.	4%
		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%
		1.4	Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	4%
		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.	8%
		2.2	Promote efficient travel between modes by creating connections and removing barriers.	6%
		2.3	Promote safe connections between modal alternatives.	5%
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.	6%
4.	**Security**	4.1	Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.	5%
		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.	5%
6.	**System Efficiency Management and Operations**	6.1	Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.	5%
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 justice populations).	4%
8.	**Safety**	8.1	Maintain a safe transportation system for all land transportation modes.	7%
		8.2	Improve safety of the community through connectivity of the transportation infrastructure.	4%
9.	**Additional Goals**	9.1	Obtain sufficient and specific transportation funding.	4%
		9.2	Optimize project delivery.	3%
		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.	3%
				100%





Chapter III

Maui District's Transportation Context and Needs

III. Maui's Transportation Context and Needs

Maui, Molokai, and Lanai's land transportation systems are critical in supporting the movement of its people and goods throughout each of the islands.

The roadway system carries all modes of land transportation on a daily basis including passenger vehicles, buses, freight trucks, bicyclists, and pedestrians. The transportation network connects communities and allows people to live, work, and play. It also supports the economy and emergency services and provides a lifeline for residents during natural disasters.

As the district's population grows and its economy evolves, the needs of the transportation system will change. Future development will increase the load on the region's roads. In order to plan for the future, current transportation 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 of Maui, Molokai, and Lanai. This section begins with a description of the work already done in previous plans and policies that lay the foundation of this 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 Islands of Maui, Molokai, and Lanai 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 each of the islands.

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 Maui Countywide Policy Plan, the Maui Island General Plan, and Community Development Plans were reviewed. These documents provide policy guidance and considerations to address issues related to growth and land use development, while recognizing the assets of the islands' towns and communities.

Land use policies are important to transportation planning because the road system and the types of facilities are often driven by land uses. Through planning, the transportation network can be developed to provide adequate mobility while appropriately supporting adjacent land uses. Policies related to land use in Maui County aim to accommodate anticipated future growth in developed areas while maintaining the natural environment and character of individual communities.

Areas such as Kahului or West Maui may encourage a mixture of land uses to accommodate both residents and visitors, while areas such as Paia-Haiku and Molokai may be focused on development appropriate to a more traditional lifestyle based in agriculture. Land use considerations in the Maui Countywide Policy Plan were also given to preserve open spaces and maintain the natural environment and marine resources of the islands.

Land use districts outline allowable development and constraints that affect transportation demands, infrastructure, and services. Exhibits 3-1a through 3-1c present the existing urban, rural, agricultural, and conservation land use districts on each of the islands in Maui District.



Kaahumanu Avenue near Kahului Harbor carries all land transportation modes on Maui.

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 3-1a. Maui Land Use District Designation
Source: State of Hawaii – Land Use Commission (2007)

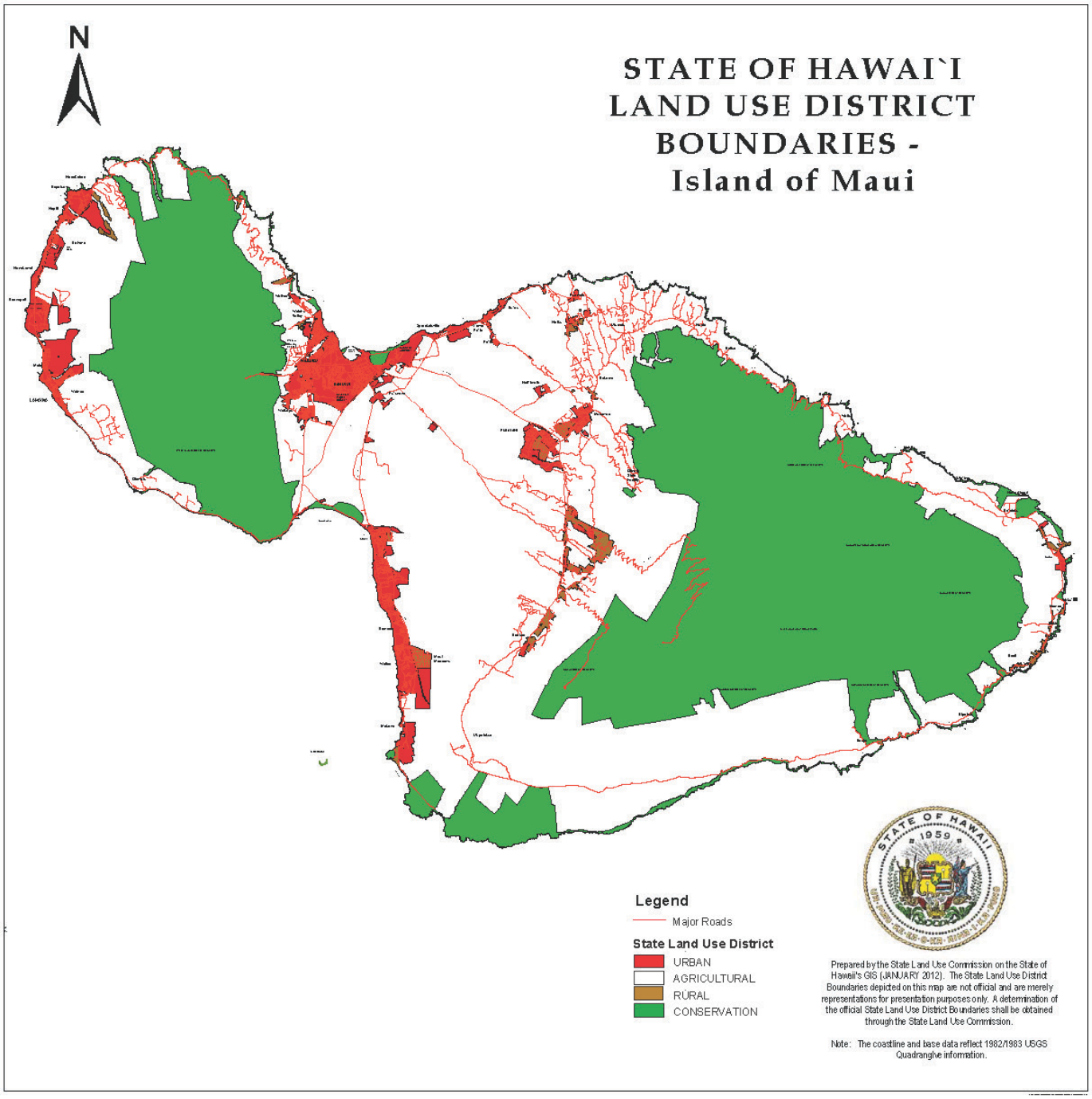


Exhibit 3-1b. Molokai Land Use District Designation

Source: State of Hawaii – Land Use Commission (2007)

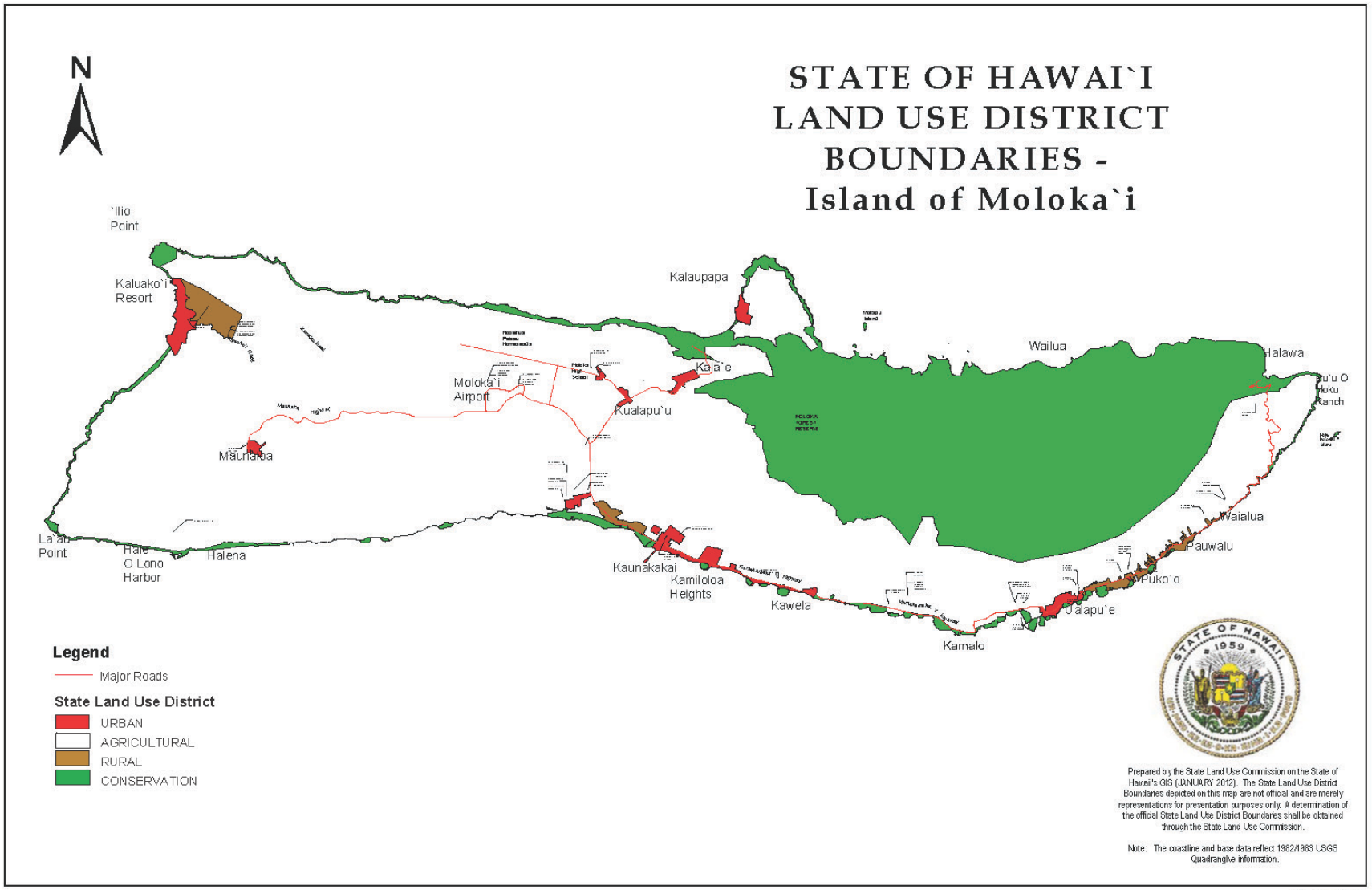
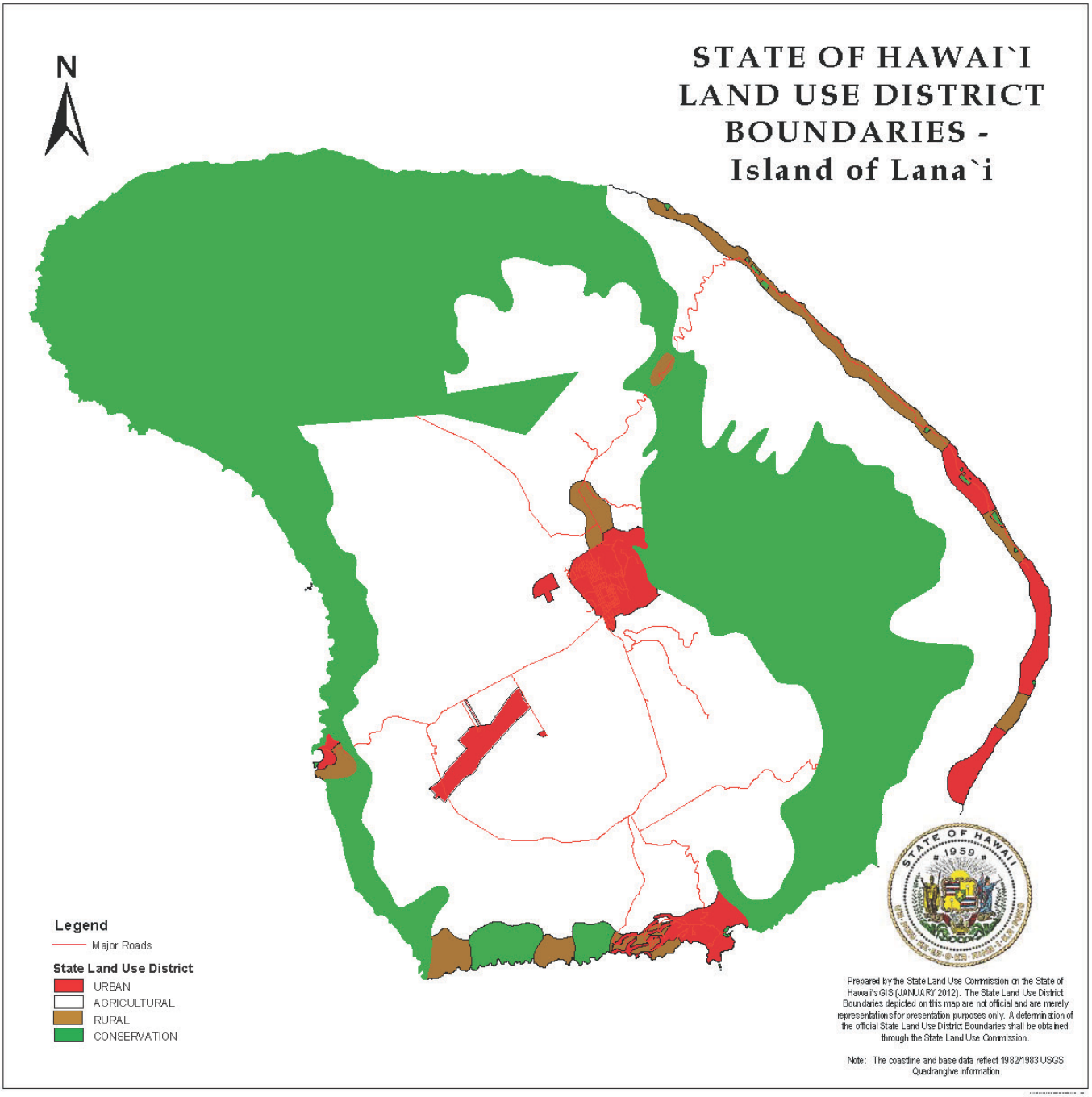


Exhibit 3-1c. Lanai Land Use District Designation
Source: State of Hawaii – Land Use Commission (2008)



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 socioeconomic conditions, distribution into TAZs, and the travel demand model, see Appendix D.

Population

The majority of the district's population resides in the urban areas of Wailuku-Kahului (35 percent) and Kihei-Makena (19 percent) on the Island of Maui. The Hana area on the east coast of the Maui Island is the least populated with just 2 percent of the district's population. Molokai accounts for 5 percent and Lanai accounts for 2 percent of the district's total population.

A portion of the Island of Maui's population currently lives below the poverty line. According to 2010 United States Census data, between 20 and 40 percent of the population in Paia and south Kihei are considered to live below the poverty line. In certain areas of south Lahaina, Haiku-Pauwela, Makawao, and Wailuku-Kahului between 10 and 20 percent of the population currently live below the low-income threshold. Less than 5 percent of the population in Hana, Kaanapali, and Kapalua are estimated to live below the poverty threshold.

Less than 5 percent of Lanai's population lives below the poverty line, while up to 20 percent of the population in east Molokai, and up to 40 percent of the population in west Molokai, currently live below the poverty line.

By 2035, the population on Maui is expected to grow by over 40 percent. The most significant growth is expected in the Kihei-Makena and Wailuku-Kahului areas. Population growth on Molokai and Lanai is expected to be nominal by 2035.

Households

The majority of households are located on the western half of Maui Island. The area of Wailuku-Kahului has approximately 30 percent of the district's households while Kihei-Makena has approximately 21 percent. Hana, on the eastern half of Maui Island, accounts for the lowest percentage of households at just 2 percent. Molokai and Lanai represent a small percentage of the total households at 5 percent and 2 percent, respectively.

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 over 50 percent. The most significant growth is expected in the Wailuku-Kahului and Kihei areas (approximately 70 percent more households than today) and West Maui (households would nearly double by 2035). Household numbers on Molokai and Lanai are expected to remain the same in 2035 compared to existing conditions.

Employment

The Wailuku-Kahului area is the primary employment center on Maui Island with approximately 45 percent of all district jobs located within this area. The West Maui (22 percent) and Kihei-Makena (18 percent) areas also support a significant percentage of the total job opportunities in the district. Molokai and Lanai support a small percentage of the total job opportunities at 3 percent and 2 percent respectively. The majorities of jobs on Maui are related to the service or retail industry. Military employment on Maui (active duty, reservist, and civilian employees) accounts for less than 1 percent of the island's total employment.

By 2035, the total number of jobs on Maui, Molokai, and Lanai is expected to grow by approximately 45 percent. Growth in employment is expected to increase the most in the Wailuku-Kahului area. Forecasts predict that the Wailuku-Kahului area will support approximately half of the district's job opportunities in the future and will remain its primary employment center. Job opportunities are also expected to rise considerably in the Kihei-Makena area. See Exhibits 3-3a and 3-3b.

Exhibit 3-2a. 2007 Household Forecasts

Source: CH2M HILL (2012a)

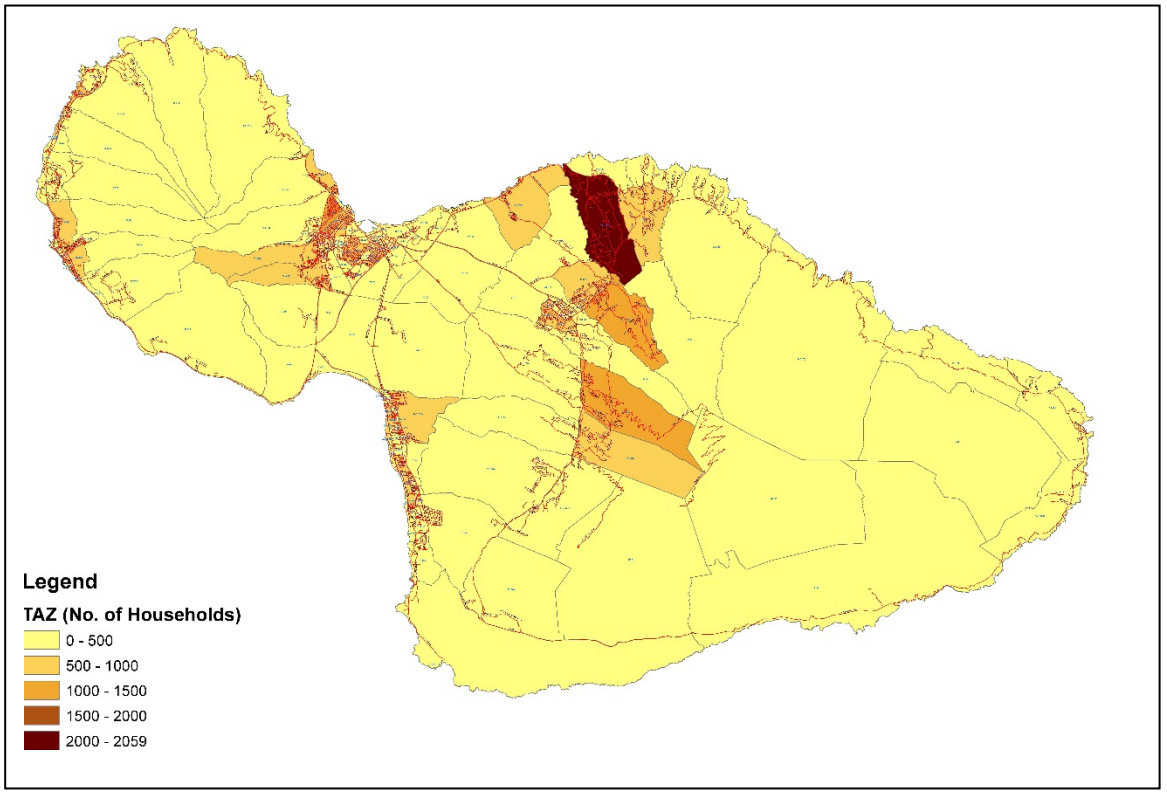


Exhibit 3-2b. 2035 Household Forecasts

Source: CH2M HILL (2012a)

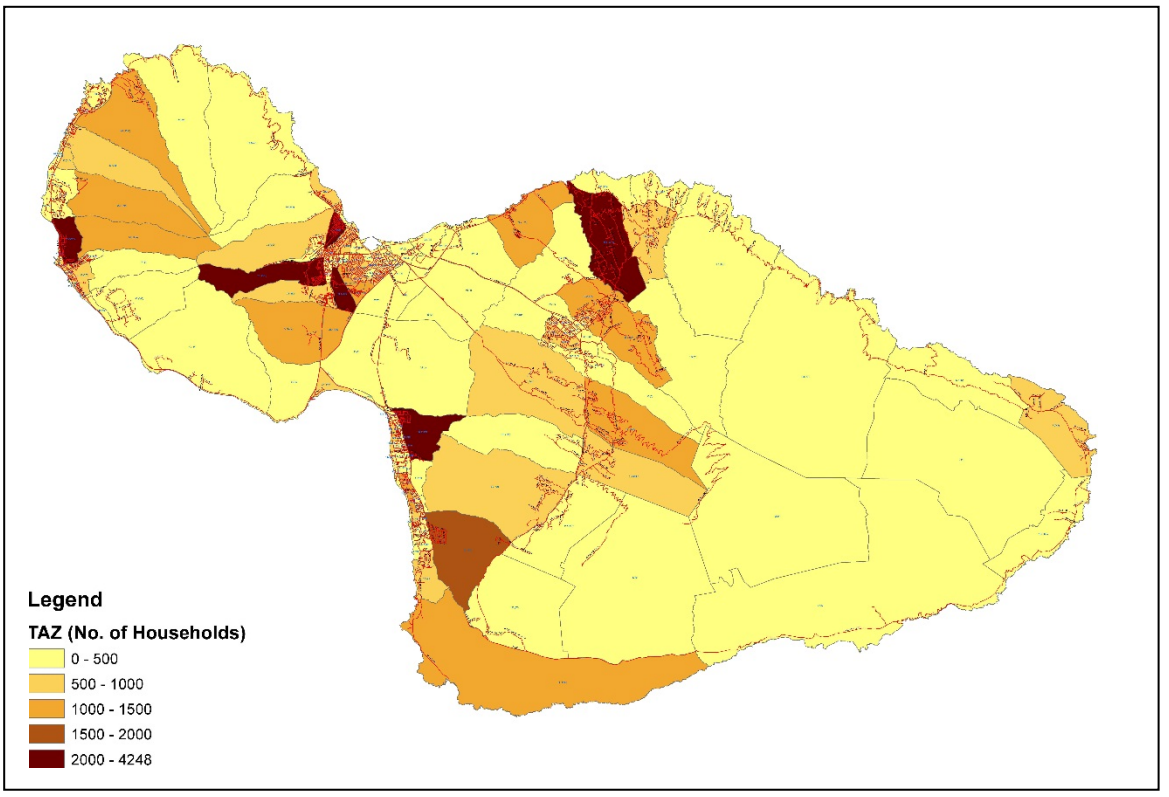


Exhibit 3-3a. 2007 Employment Forecasts

Source: CH2M HILL (2012a)

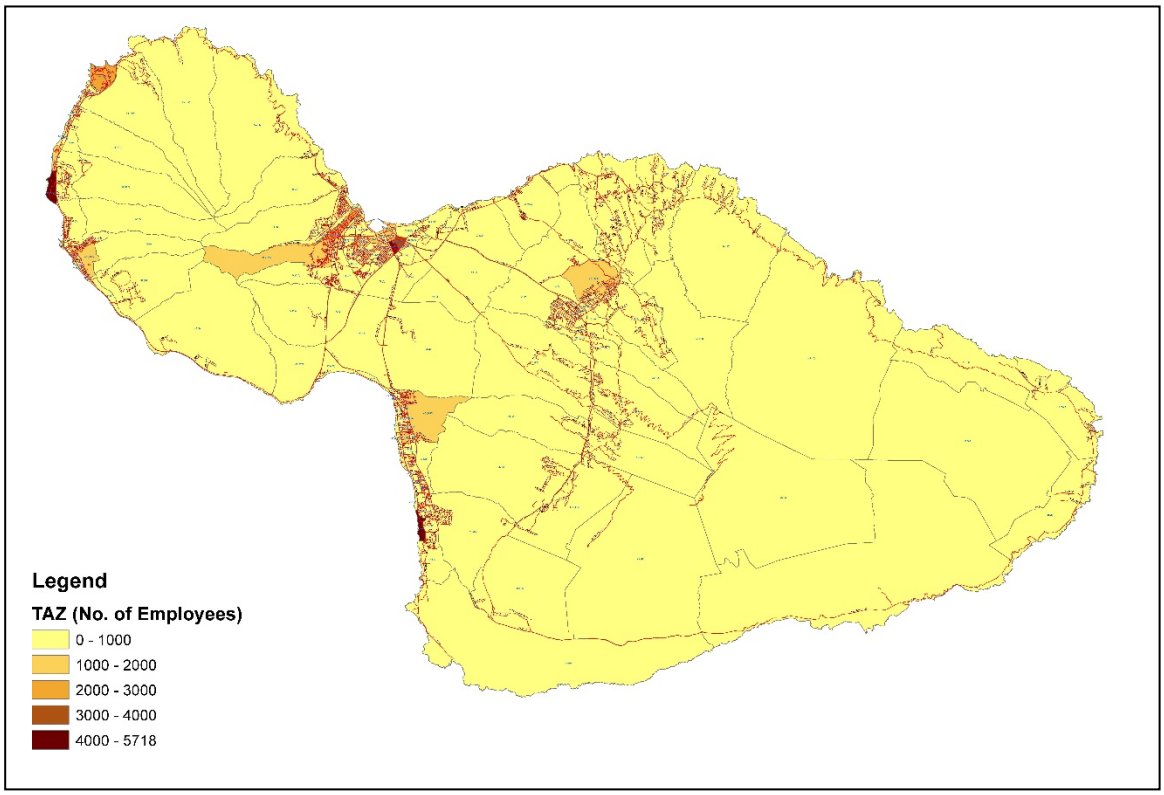
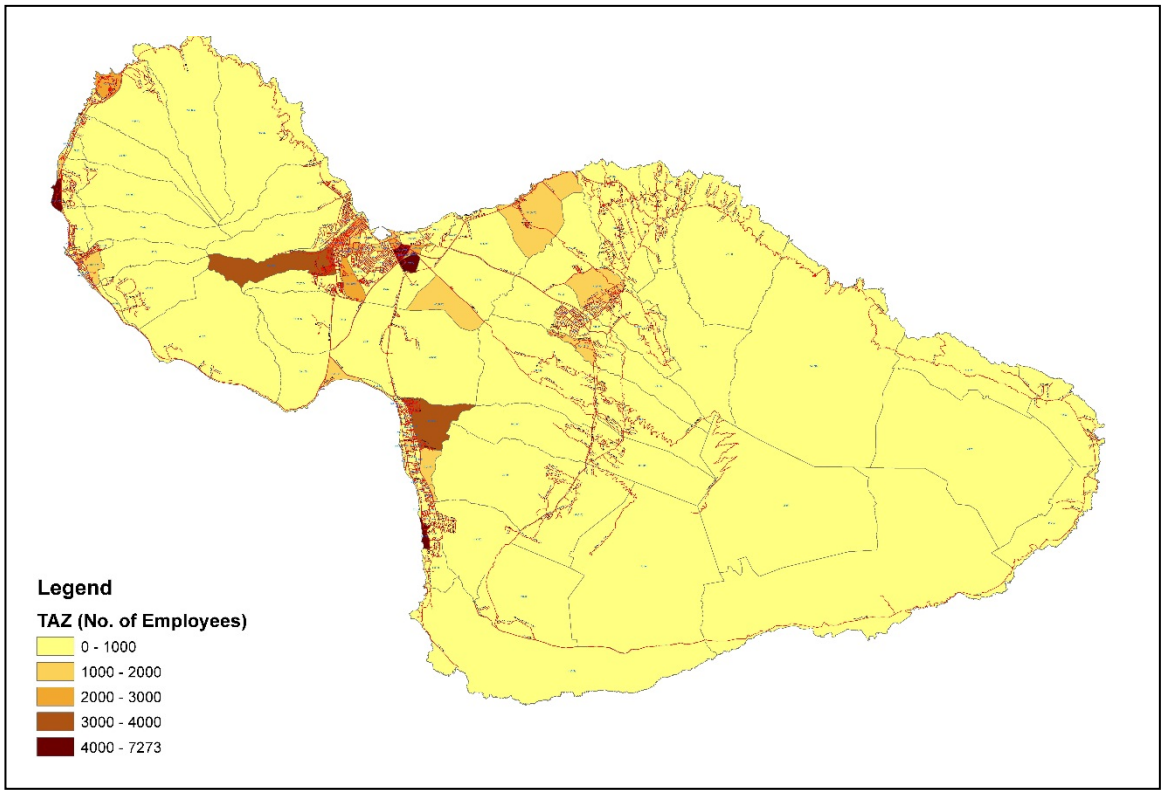


Exhibit 3-3b. 2007 and 2035 Employment Forecasts

Source: CH2M HILL (2012a)



Visitor Industry

Maui District's leading economic sector is tourism and will likely remain so in the future. The Island of Maui accommodates nearly all of the visitors to the district. They arrive at one of three airports: Kahului, Kapalua, or Hana, or they arrive at Kahului Harbor via cruise ships. In comparison to the Island of Maui, only a small percentage of visitors travel to Molokai and Lanai.

On an average day in 2007, the Island of Maui welcomed nearly 50,000 visitors. Molokai and Lanai each had approximately 1,000 visitors to the island on an average day. The visitors to the Island of Maui stay in the Kihei and Kaanapali areas as they have the island's highest number and concentration of hotel rooms.

In the future, the visitor industry is expected to grow in Maui District. The vast majority of growth is expected to occur on the Island of Maui while little growth in tourism is expected on either Molokai or Lanai. Growth in tourism, and the anticipated increase in accommodations to support it, will result in more vehicles traveling between the islands' major destinations. Compared to today, approximately 17 percent more air and harbor visitors are expected to arrive in the region by 2035.

Exhibit 3-4 presents a summary of the expected increases in population, households, and employment in Maui District by 2035. The growth in annual visitors to the three islands is also shown.

Exhibit 3-4. Forecast Socioeconomic Conditions

Characteristic	2007	2035	Difference	Percent Growth
Population (persons)	145,700	207,900	62,200	43%
Households (units)	51,000	77,800	26,800	53%
Employment (positions)	73,800	106,100	32,300	44%
Annual Visitors (million persons)	2.52	2.95	0.43	17%



Lahaina is one of top tourist destinations on Maui



Tour groups drive along the scenic Honoapiilani Highway, Maui

Roadway System

The Island of Maui's roadway network includes major highways that primarily extend from Kahului through the central valley and around the perimeter of the island. Access through the central valley is provided by the principal arterials: Honoapiilani Highway, Kuihelani Highway, and Mokulele Highway.

In West Maui, there are several highways with different classifications that provide access around the coastline. Starting from the south shoreline, Honoapiilani Highway is classified as a principal arterial, changes to a minor arterial through Lahaina, and then becomes a collector roadway through Kapalua. These highways serve as the primary 'belt road' access around west Maui and connects the area's town and communities. These highways are important as there is no access through or across west Maui.

In east Maui, Hana Highway is classified as a principal arterial within Kahului and then becomes a minor arterial and finally a collector roadway as it moves away from Kahului along the coastline towards Hana. As the road continues around the east end of the island and to the southeast coast, it becomes Piilani Highway and then Kula Highway as it provides access to Kula and the upcountry near Haleakala National Park. Both of these highways are classified as collector roadways.

The Islands of Molokai and Lanai do not have roadways functionally classified as principal or minor arterials. Molokai does have collector roadways and they include Kamehameha V Highway, which provides access along the south shore, and Mauna Loa Highway, which provides access to the airport and the western portion of the island. Kalae Highway and portions of Farrington Avenue and Puupeelua Avenue in central Molokai are also classified as collectors. On Lanai, collector roadways include Kaumalapau Highway, Manele Road, Fraser Avenue, Lanai Avenue, and Access Road to Lanai Airport. These roadways provide access between Lanai City, Lanai Airport, Kaumalapau Harbor, and Manele Small Boat Harbor.

The Plan encompasses solutions that are on the federal-aid highways as shown in Chapter 1.



Farrington Avenue is a rural major collector, Molokai

Travel Demand

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

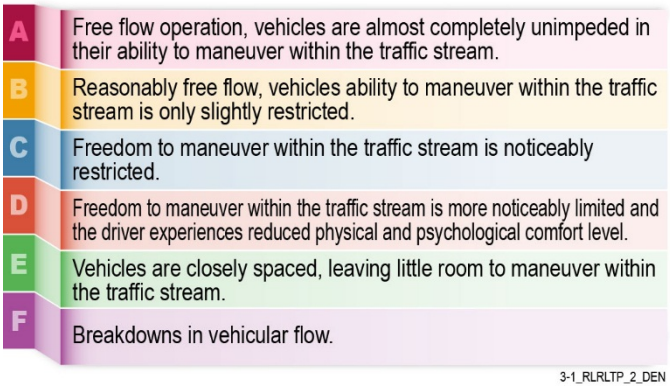
Because the federal-aid highways support all modes of travel, the impact of higher demand is likely to affect general traffic, freight vehicles, transit, bicyclists, and pedestrians.

The following discussion compares the existing and future travel demand and the changing conditions of each travel mode. It also identifies the competing needs of the various modes 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 on Maui are highest in the western areas of the island. Along Honoapiilani Highway from Maalaea approaching Kaanapali, up to 39,100 vehicles daily travel this highway making it one of the busiest roadways in Maui. This segment has a V/C ratio of greater than 1.0 and operates at LOS F.

In the narrowest part of the island between Kahului and Kihei, Mokulele Highway currently carries approximately 33,600 vehicles per day (in both directions), while Honoapiilani Highway carries approximately 15,400 vehicles and Kuihelani Highway carries approximately 17,000 vehicles. Each of these three highways has V/C ratios of less than 0.80 and operates at LOS C or better.

The roadway networks in Molokai and Lanai have considerably less traffic and typically do not experience congestion similar to Maui. Currently, the federal-aid highways operate at LOS C or better.

In the future, traffic is expected to increase due to a larger population, more jobs, and new land developments on Maui. By 2035, the average daily traffic volume is expected to increase by over 80 percent along Mokulele Highway south of Kahului, resulting in LOS F conditions.

Honoapiilani Highway from Kahului through Maalaea, Lahaina, and Kaanapali would expect to see greater volumes by 2035. Nearly 51,000 daily vehicles could be expected to travel on the highway near Kaanapali. This represents roughly 30 percent growth in traffic over existing conditions and would result in increased daily congestion.

Travel times between communities would increase, and vehicles may experience long delays and slow travel times. Because these facilities would not be able to handle the expected traffic, they are identified as a transportation need/deficiency. See Exhibits 3-5 and 3-6 for existing and future operating conditions on Maui Island. Exhibit 3-7 shows the existing operating conditions on Molokai and Lanai. Future growth on Molokai and Lanai is not expected to significantly change traffic conditions. Therefore, future operations are expected to be similar to existing conditions.

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

Source: CH2M HILL (2012a)

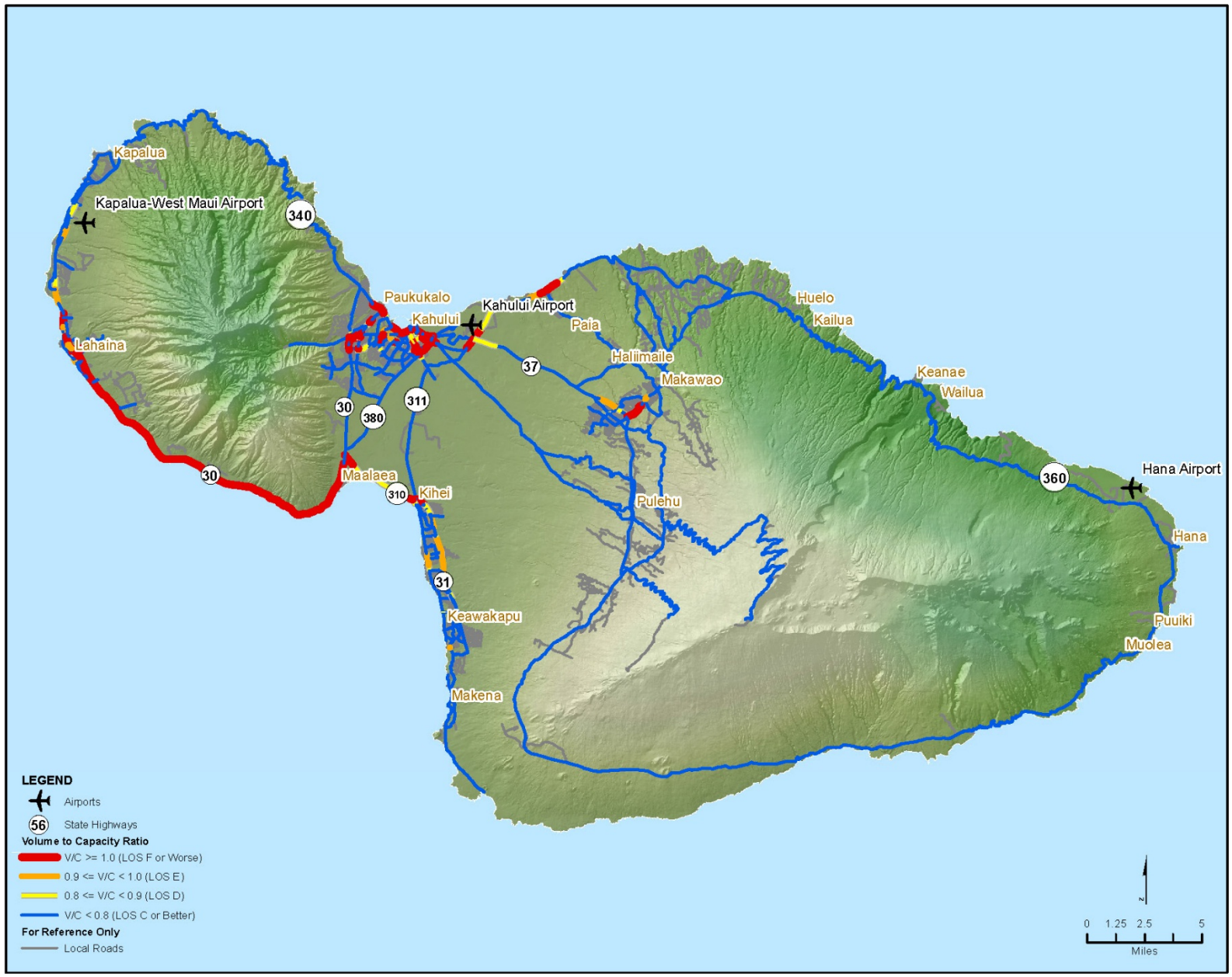


Exhibit 3-6. 2035 Volume-to-Capacity Ratio (No Build)

Source: CH2M HILL (2012a)

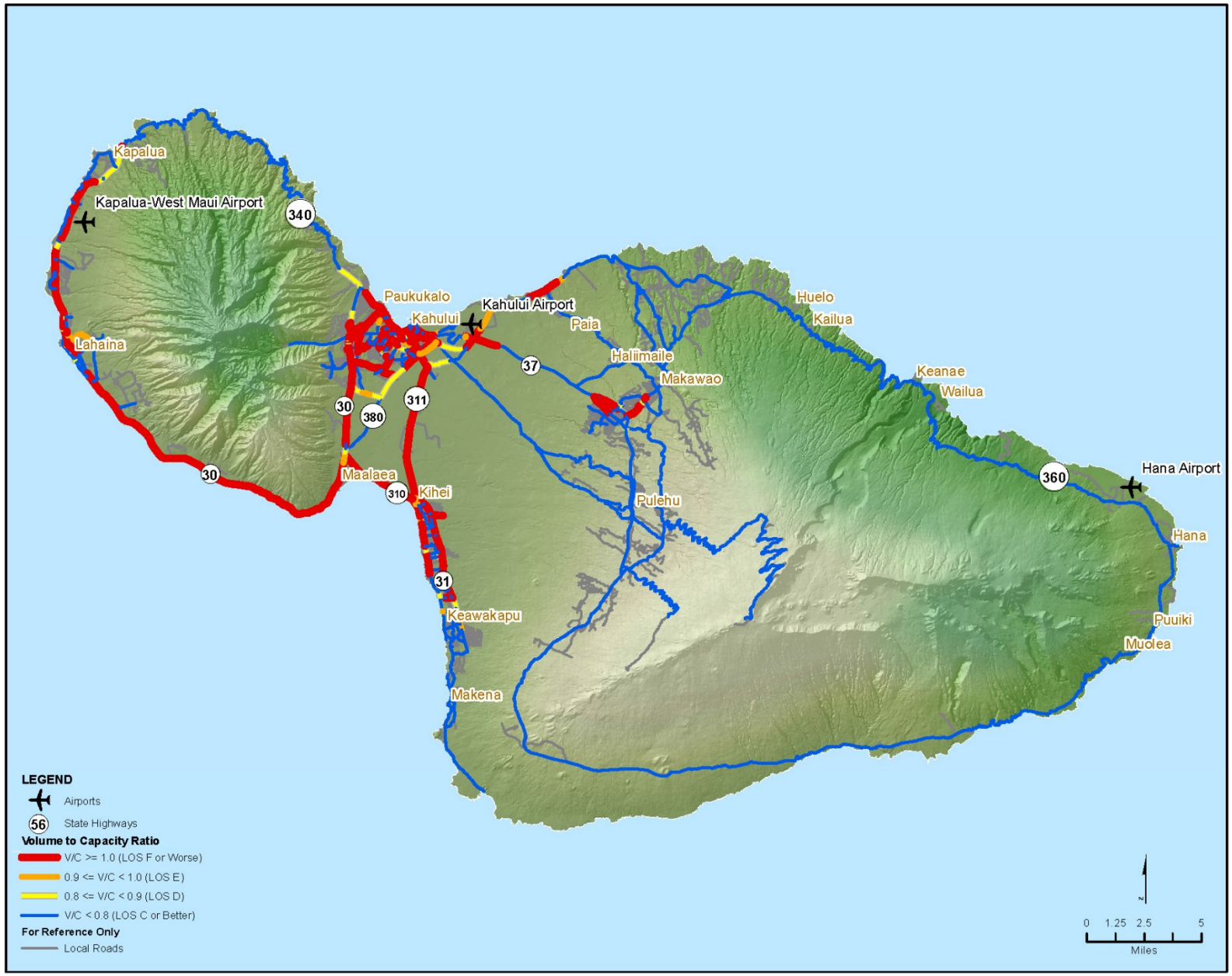
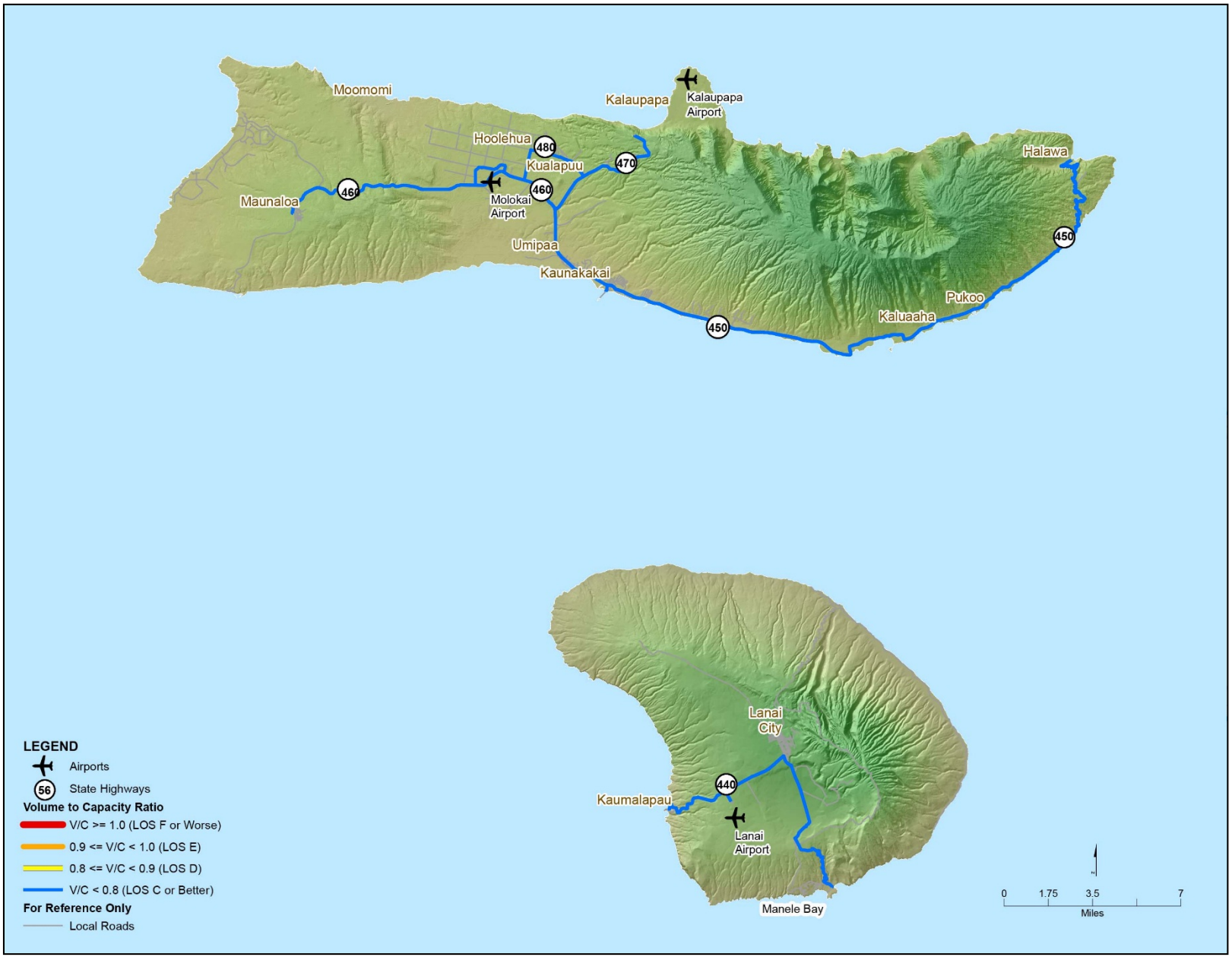


Exhibit 3-7. Existing Operating Conditions on Molokai and Lanai

Source: CH2M HILL (2012b)



Freight System

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

On the Island of Maui, freight cargo is handled at Kahului Airport and Kahului Harbor. They are less than 2 miles apart centrally located on the north side of the island. Freight vehicles utilize Kuihelani and Honoapiilani Highways to distribute goods to the Kapalua/Kaanapali/Lahaina resort areas on the west side of the island. Mokulele Highway carries freight vehicles and goods from the harbor and airport to the Kihei/Makena area, while Hana Highway on the northeast perimeter of the island is the main transport route for goods to the east side of the island.

Molokai has two small public airports; Molokai Airport is centrally located in Hoolehua along Mauna Loa Highway, and Kalaupapa Airport which serves commuter planes on the north side of the island. Kaunakakai Harbor is located on the south side of the island along Mauna Loa Highway / Kamehameha V Highway. Freight vehicles from Kaunakakai Harbor use Mauna Loa Highway and Kalae Highway to transport goods into the business and commercial center of the island.

Lanai's freight cargo is handled at Kaumalapau Harbor and Lanai Airport. Both are located along Kaumalapau Highway. From the harbor or the airport, freight is transported on Kaumalapau Highway to Lanai City, and on Manele Road to the resort area on the south side of the island.

Over 35,000 tons of cargo pass through the District of Maui's airports and approximately 95 percent of this cargo is handled in the Island of Maui. Kahului Harbor currently handles over three million tons of cargo, which is approximately 262,400 twenty-foot equivalent units (TEUs). No information is available for existing cargo through Kaumalapau Harbor on Lanai or Kaunakakai Harbor on Molokai.

As the economy is expected to grow, cargo tonnage into and out of the Maui Island is expected to increase. By 2035, combined freight at the Island of Maui's airports and Kahului Harbor could increase by nearly 30 percent, resulting in over 43,000 tons at the airports and almost 4.1 million tons of cargo (or 339,700 TEUs) at the harbor.

The roadways surrounding Maui's airport and harbor are congested today. With the expected increase in cargo, a significant number of additional freight vehicles would be on Maui's roads to deliver necessary goods. Traffic operations would likely worsen; therefore the system needs to be improved in order to avoid costly delays and economic impacts to freight. Exhibits 3-8 and 3-9 show the distribution of freight vehicles on the Maui Island's highways.



Freight vehicles transport goods on the island's roadways, Makawao, Maui.

Exhibit 3-8. 2007 Freight Distribution

Source: CH2M HILL (2012b)

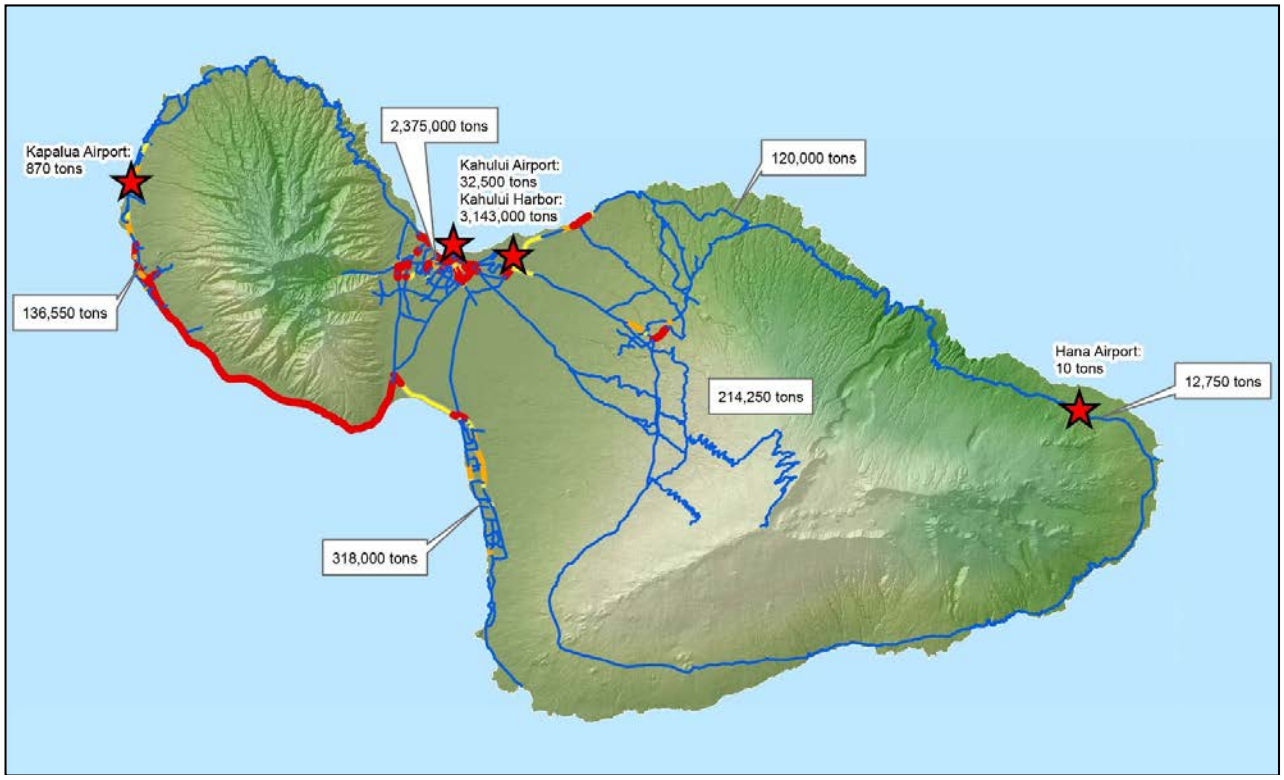
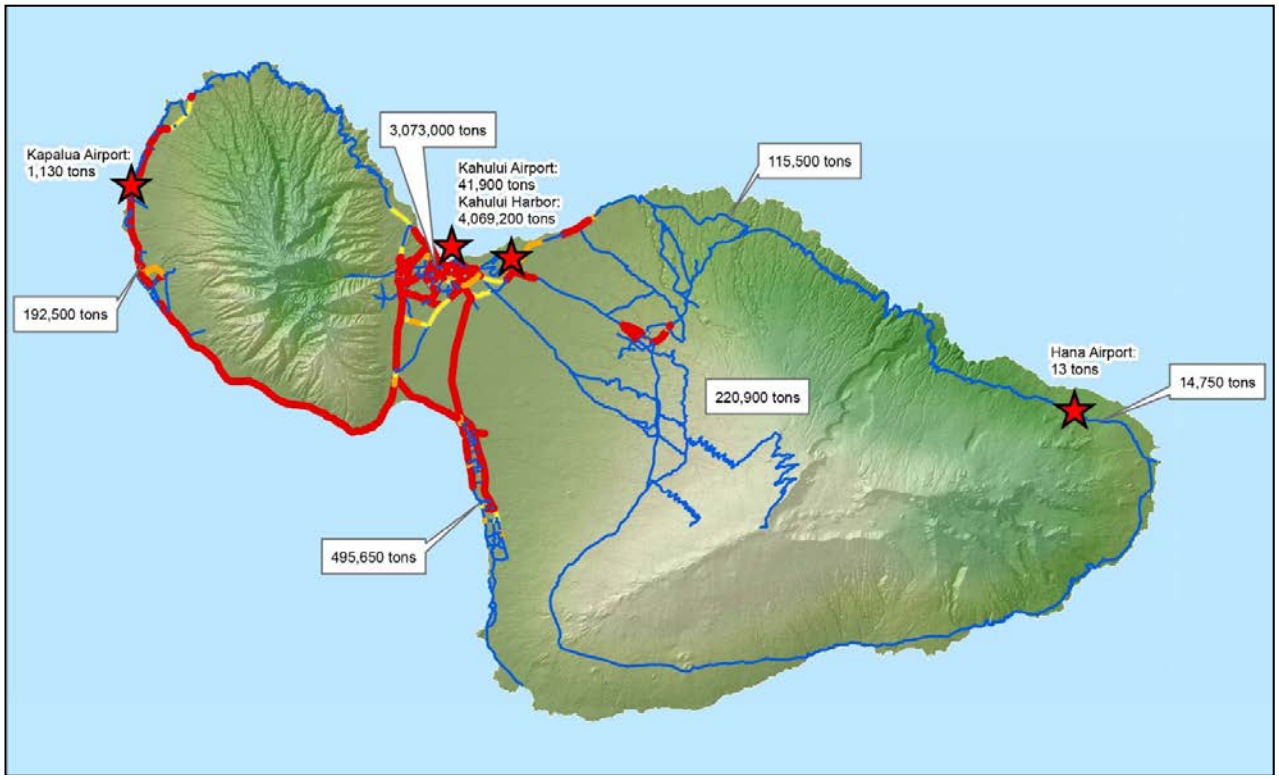


Exhibit 3-9. 2035 Freight Distribution

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 Maui Bus public transit system currently consists of fixed-route transit service, commuter transit service, and a paratransit program. Infrastructure includes transit centers, designated park-and-ride facilities, and transit stops. There are thirteen bus routes providing service within and between central, south, and west Maui, Haiku and upcountry areas. Commuter service is another option between these areas although there are only four routes and the service operates in the morning and in the afternoon in the major commute direction. Bus stops are provided on the highways in major communities. Exhibit 3-10 shows the existing service route areas.

Unique to Maui District, the Maui Economic Opportunity, Inc. provides on-call human services transportation to qualified participants on Maui, Molokai, and Lanai for a variety of programs funded through a grant from the County of Maui and overseen by the County Department of Transportation. Many programs serve the needs of seniors, youth, and the disabled throughout the district's rural areas for services such as doctor's visits, adult day care, dialysis, nutrition programs, and necessary shopping.

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, the number of stops is likely to increase with many routes running at half hour intervals, rather than the predominant one hour schedules.

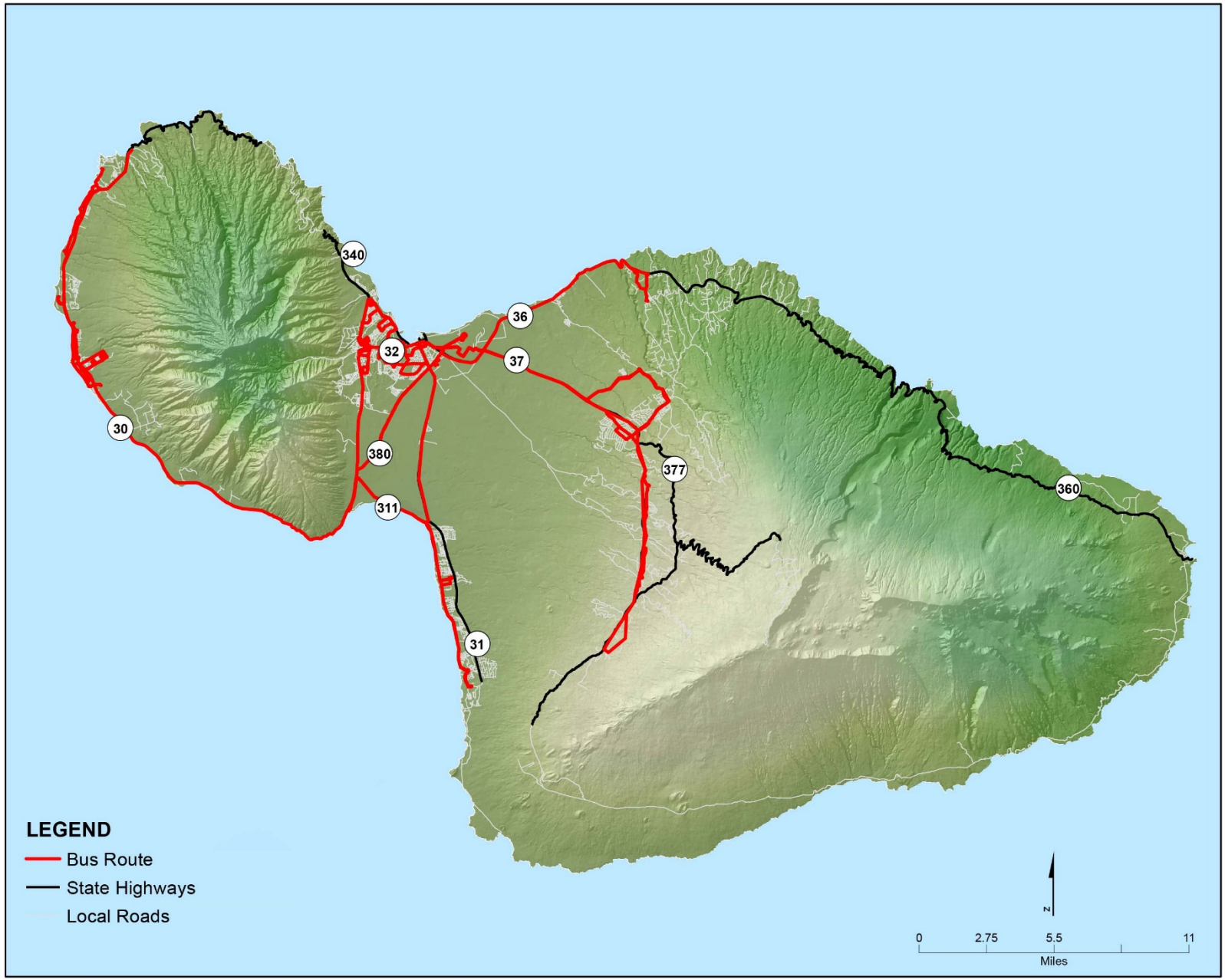
Regional transit routes rely on the highway system to operate service and maintain schedules. Because buses, passenger vehicles, and freight all must share the same road, congestion or delay on the highways would have a negative impact on transit service in terms of reliability. Improved traffic operations on these shared roadways is necessary in order to provide efficient transit service if future demand is to be accommodated.



Maui Bus provides transit service for the Island of Maui.

Exhibit 3-10. Existing Transit Routes

Source: CH2M HILL (2014)



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.

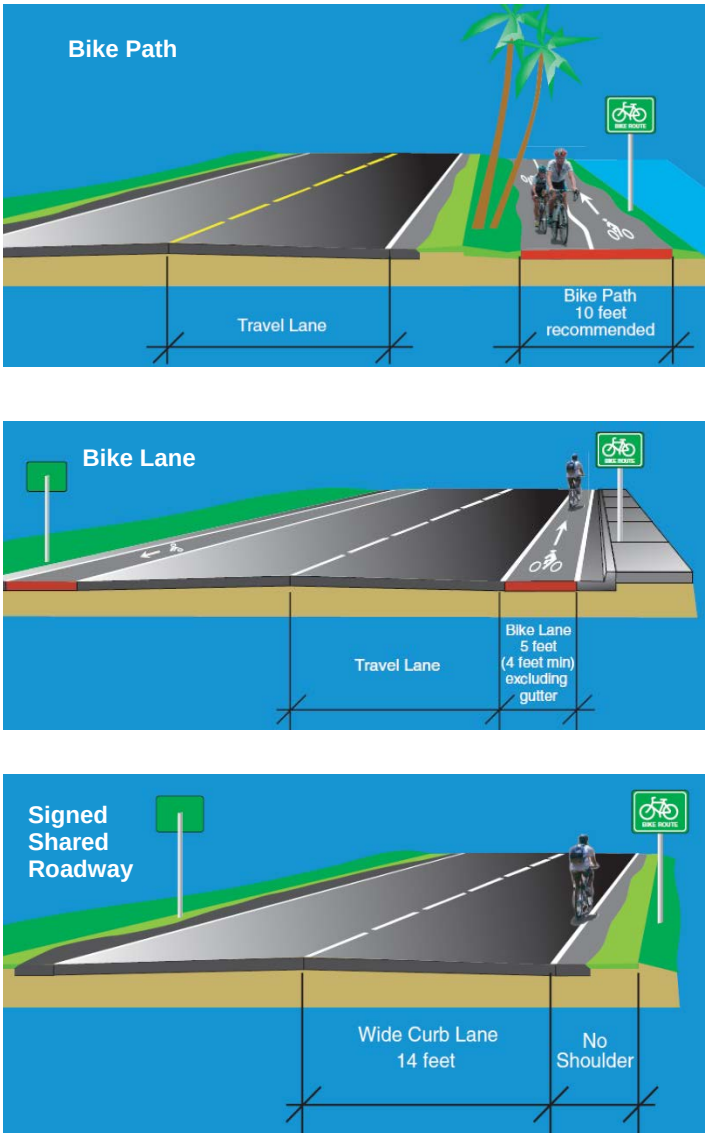
Maui has approximately 60 miles of designated bicycle facilities, which are made up of three types: paths, bike lanes, and signed shared roadways. These facilities are illustrated on Exhibit 3-11.

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 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 designed by signing as a preferred route for bicycle use. This may be an existing roadway with wide curb lanes, or paved shoulders.

Exhibit 3-11. Bike Facility Types

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



Bike Plan Hawaii provides an inventory of the existing bicycle system on Maui. Exhibit 3-12 shares the benefits of biking from Bike Plan Hawaii and Exhibit 3-13a shows the existing paths, bike lanes, and signed shared roadways on Maui. In addition to these existing facilities, bicycle racks are provided at bus shelters to allow users to secure their bicycles prior to boarding transit. Transit vehicles are also equipped with bicycle racks which can hold up to two bicycles per trip.

Future needs for bicycle facilities have also been identified in Bike Plan Hawaii. To accommodate bicycles, paths and shared facilities are proposed on most of the major highways and arterials throughout the islands. These shared roadways are intended to accommodate both bicycles and motorized vehicles on the same road. Future planned bicycle facilities on Maui are shown on Exhibit 3-12a. Molokai and Lanai currently do not have an existing bikeway system but there are plans to incorporate facilities as shown on Exhibits 3-13b and 3-13c.

Exhibit 3-12. Benefits of Biking

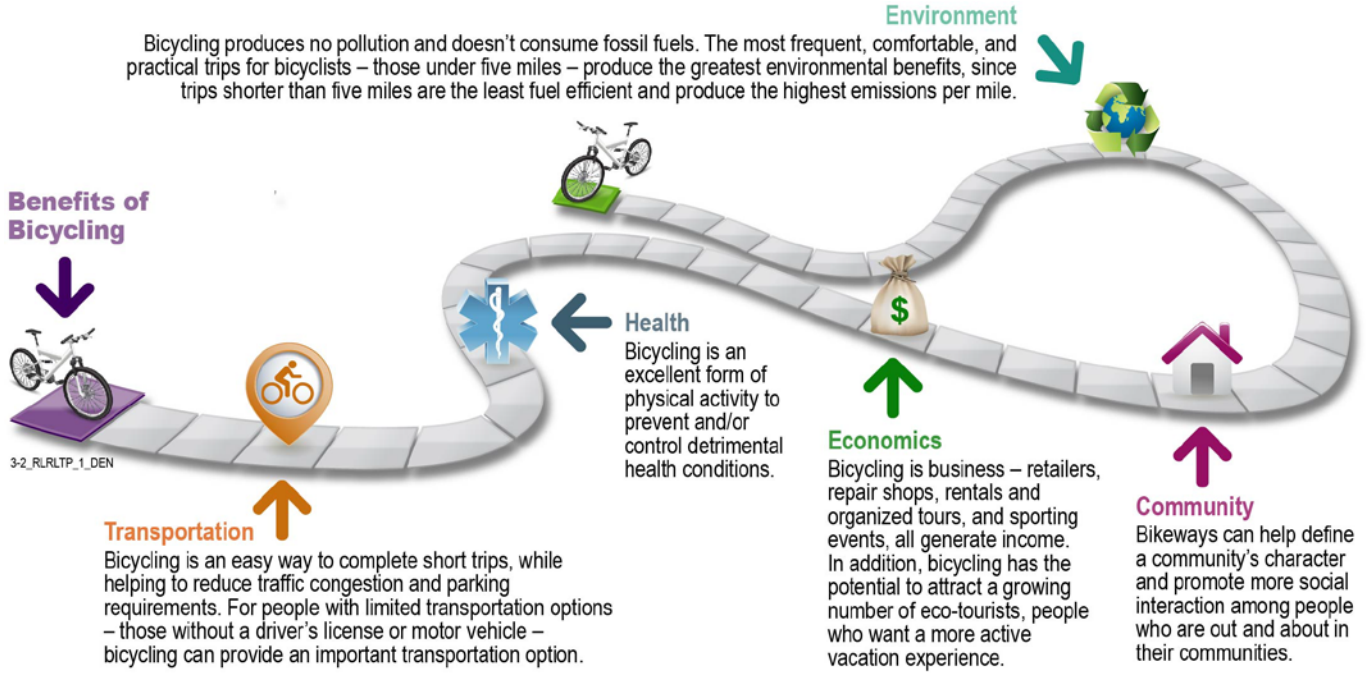


Exhibit 3-13a. Existing and Planned Bicycle System - Maui

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

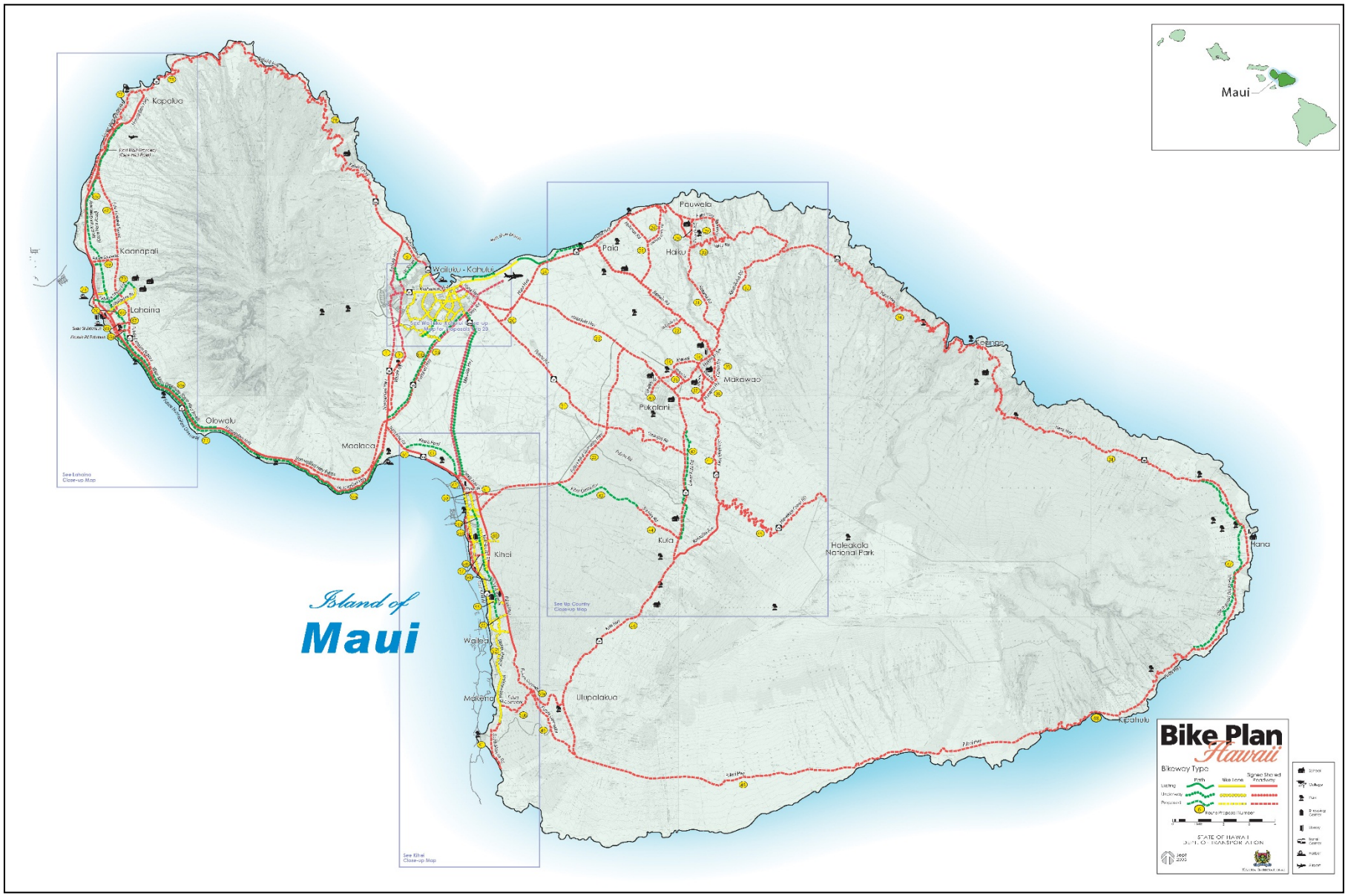


Exhibit 3-13b. Planned Bicycle System - Molokai

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

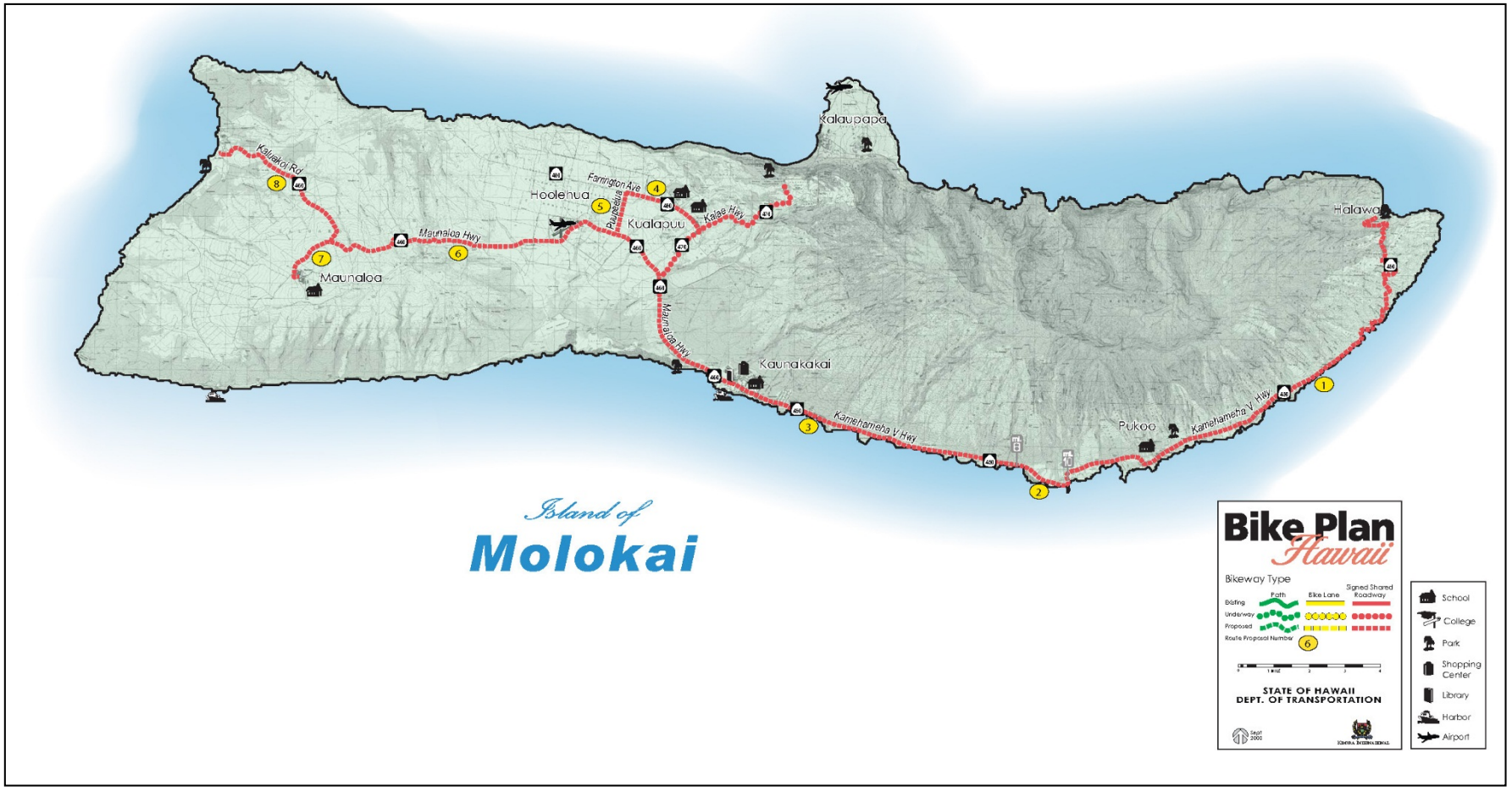
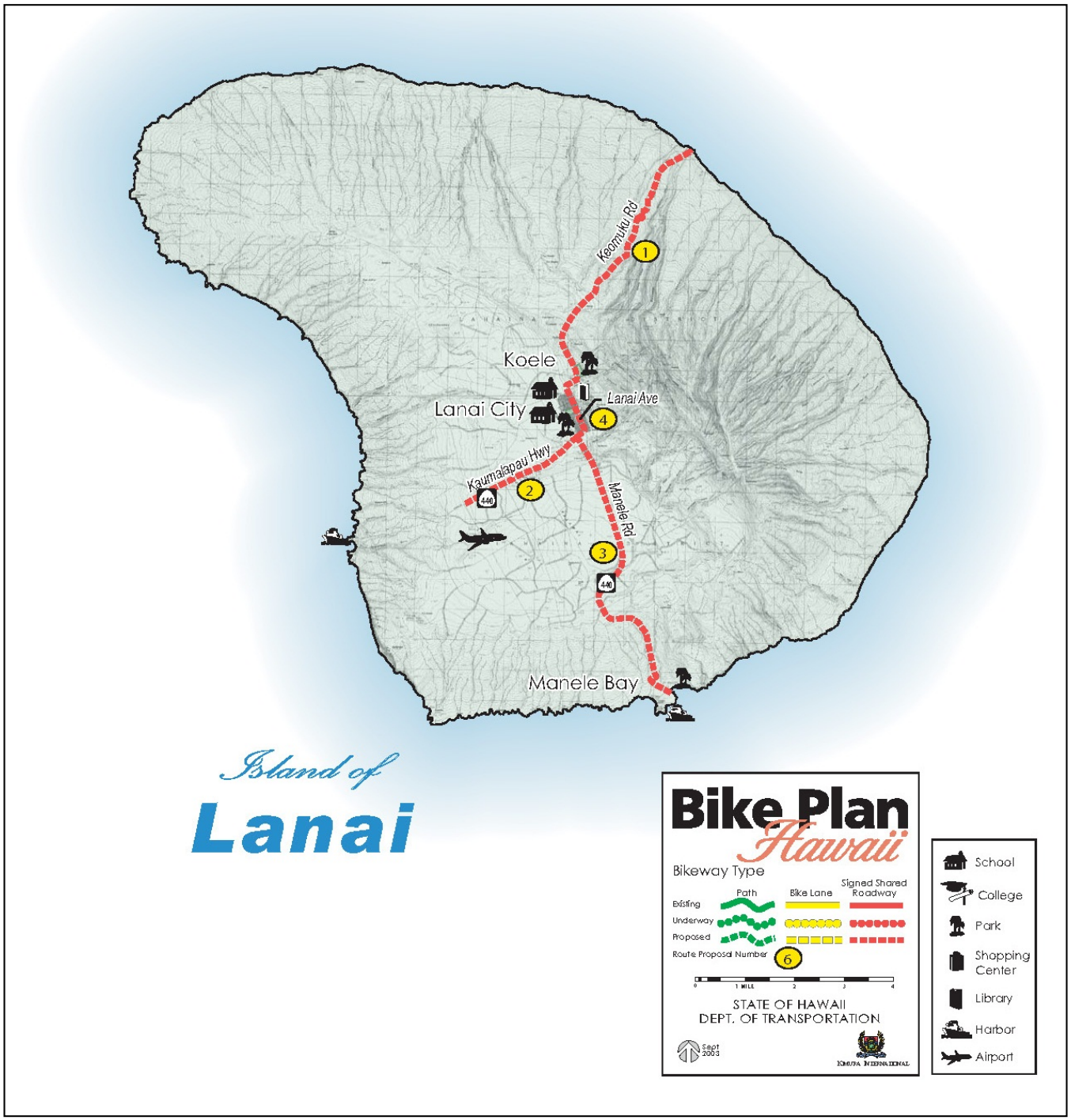


Exhibit 3-13c. Planned Bicycle System - Lanai

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.



Pedestrians crossing Baldwin Avenue, Paia, Maui.

The Statewide Pedestrian Master Plan provides information on the existing pedestrian system, shown on Exhibits 3-14a and 3-14b, and identifies areas of concern for the future. The sidewalks on the federal-aid highways on the Island of Maui are concentrated near Kahului. There are two other locations where there is a sidewalk on one side of the state highway: near Hana on the east side and near Keauakapu north of Makena on the south west coast. Molokai has a few sections of state highway that have sidewalks on one side, and Lanai has no state highway with sidewalks. Molokai and Lanai are the most rural islands compared to the rest of the state. 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.

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 3-14a. Existing Pedestrian System - Maui

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

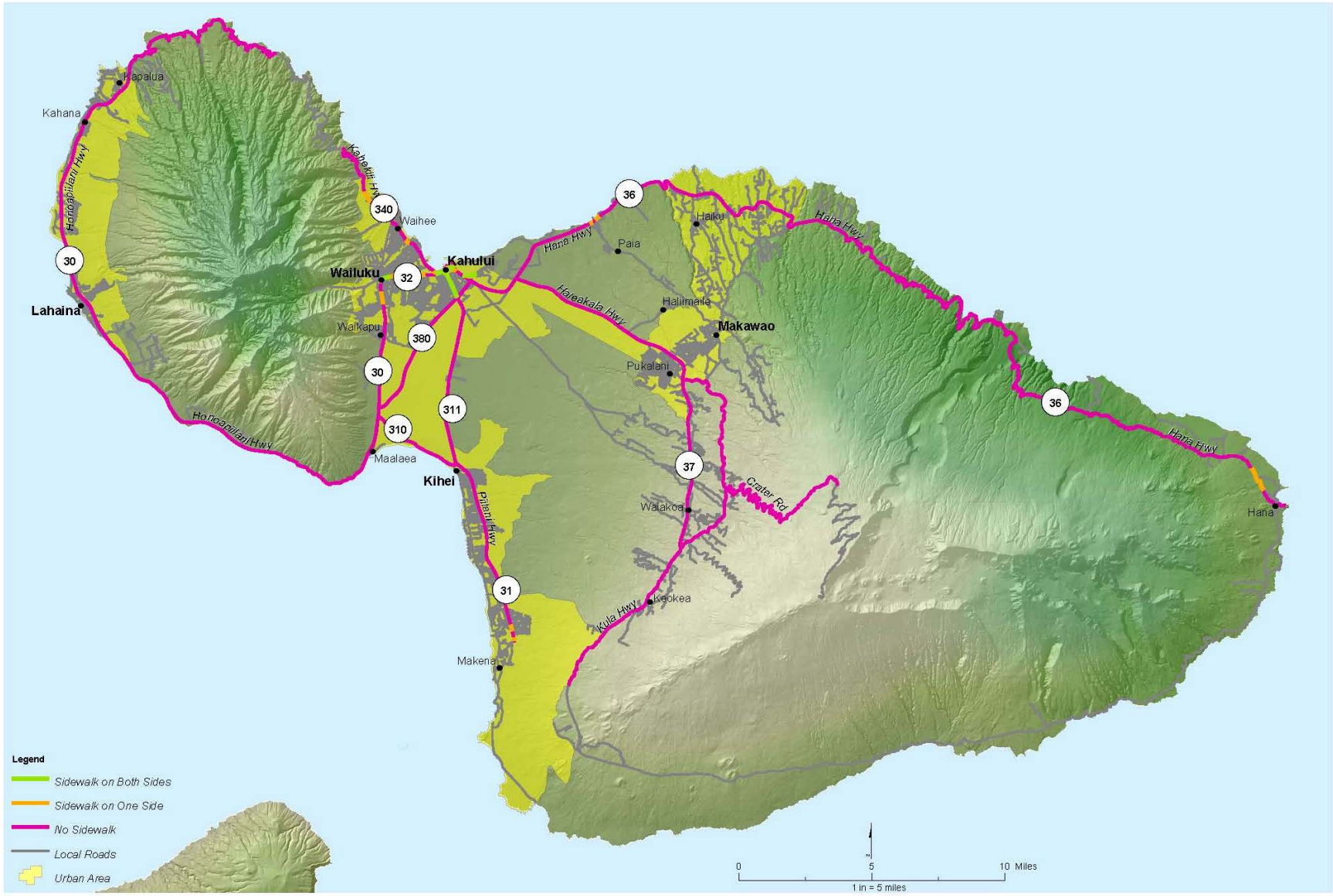
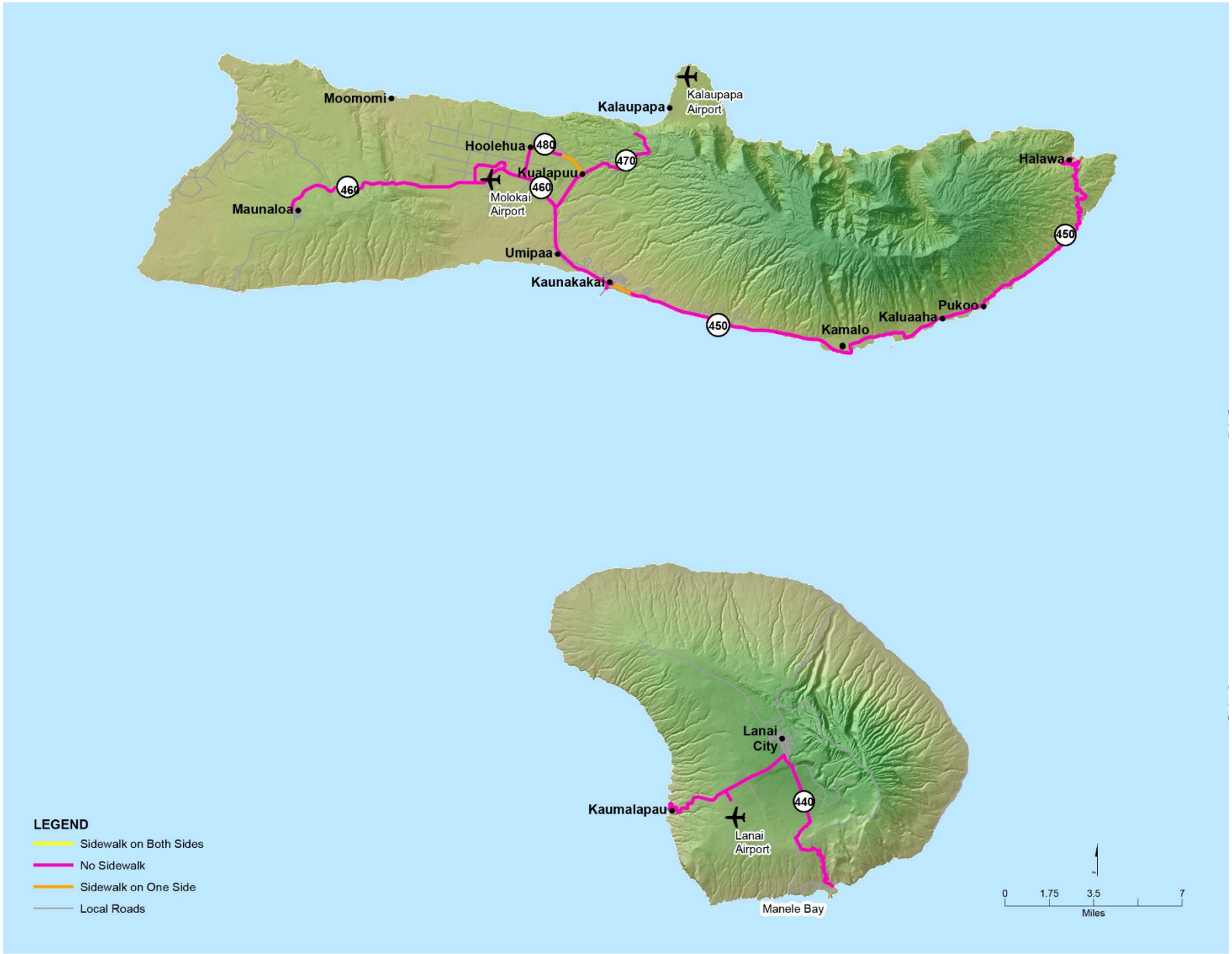


Exhibit 3-14b. Existing Pedestrian System – Molokai and Lanai

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 County of Maui Multi-Hazard Mitigation Plan focuses on assessing risks and identifying potential strategies to address these risks. Major goals of the mitigation plan include reducing property damage and economic loss, and protecting and preserving the operations of critical lifeline roadway facilities.

Due to the unique geography and perimeter highway system on the Island of Maui, many of the communities located on the west and east sides of the island have limited roadway options for reaching more populated, urban areas. Residents living on the west side must use either Honoapiilani or Kahekili Highways to reach other parts of the island. People residing on the east side must utilize Hana or Piilani Highways to access other parts of the island. When these highways are congested, emergency response times would be delayed and residents would be impacted. Exhibit 3-15a reflects the numerous critical emergency facilities on Maui, while Exhibits 3-15b and 3-15c show the facilities for Molokai and Lanai.

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 3-15a. Critical Emergency Facilities – Maui

Source: County of Maui Multi-Hazard Mitigation Plan

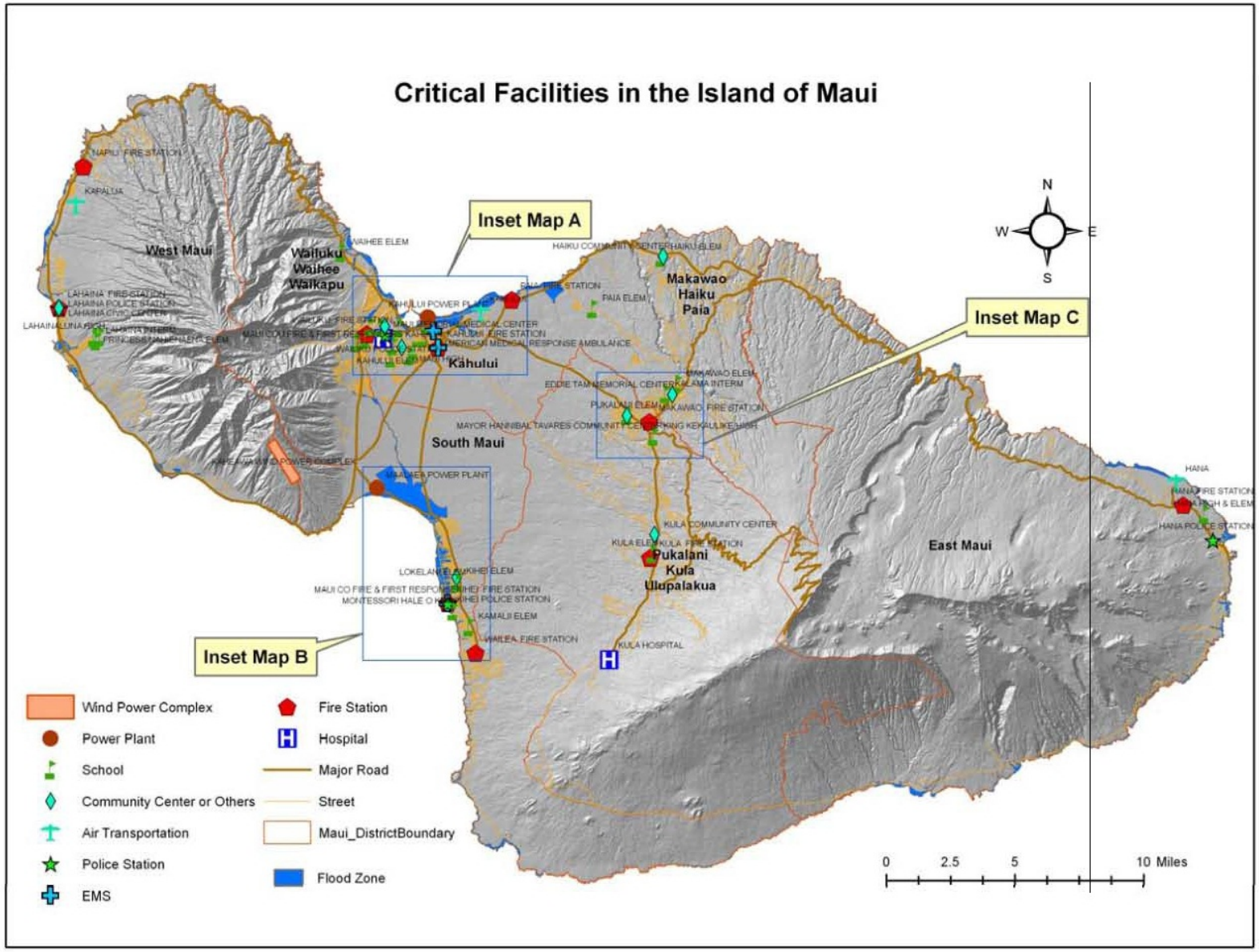


Exhibit 3-15b. Critical Emergency Facilities – Molokai

Source: County of Maui Multi-Hazard Mitigation Plan

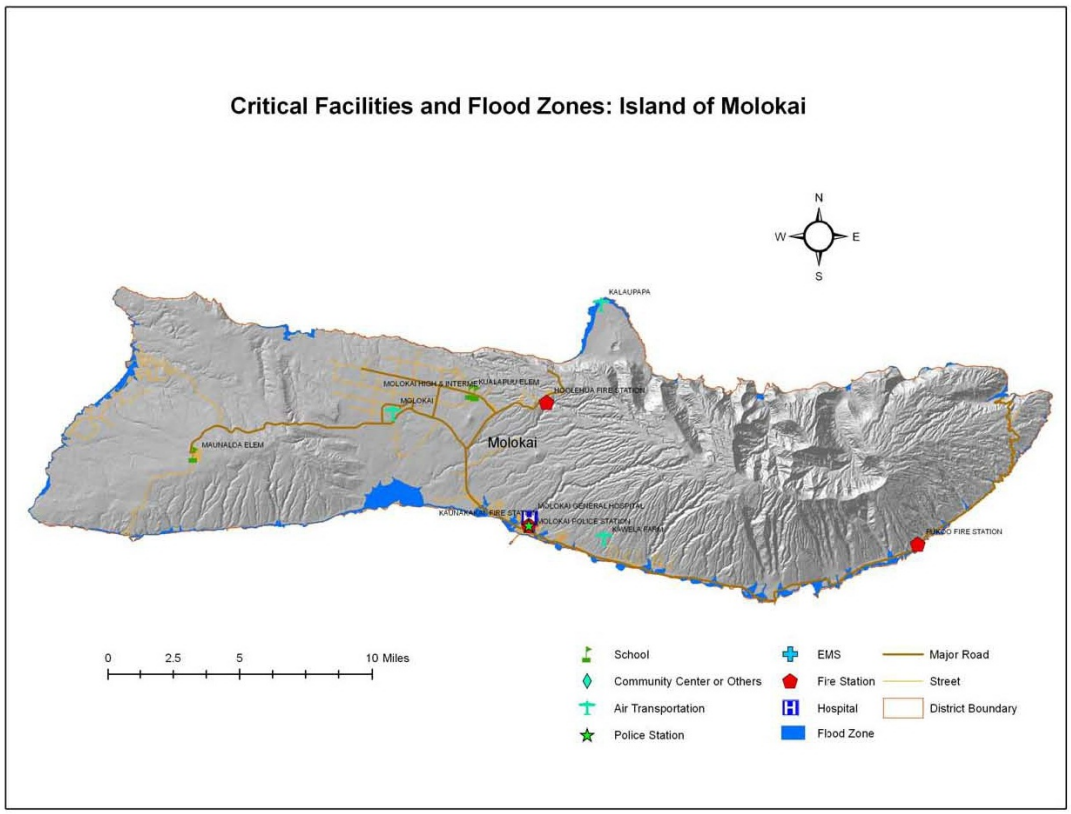
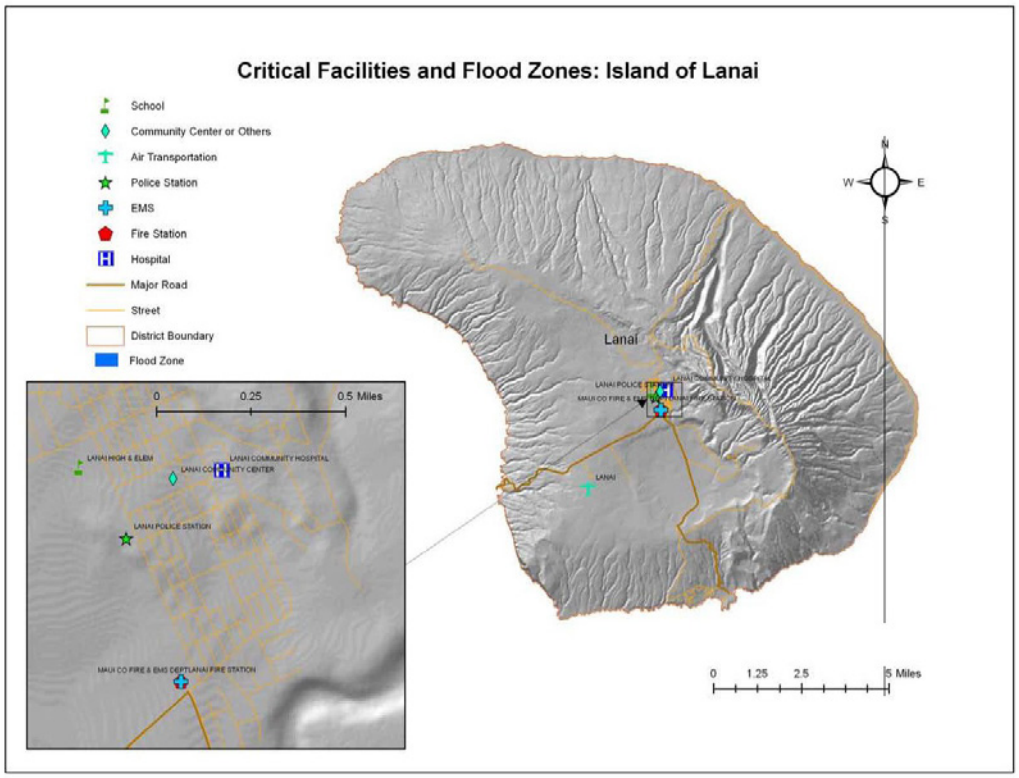


Exhibit 3-15c. Critical Emergency Facilities – Lanai

Source: County of Maui Multi-Hazard Mitigation Plan



Land Transportation Needs

Needs and deficiencies of the land transportation system on Maui, Molokai, and Lanai 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.

During these discussions, stakeholders were given maps of the islands' 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.



Stakeholders provided various perspectives on the transportation network.

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 Maui, Molokai, and Lanai for 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 Maui 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.

For Maui, 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 –** Congestion is an issue on the Island of Maui's highways and arterials, affecting residents and visitors alike. Congestion would affect general vehicles, freight vehicles, and transit because they share the same roadway. Solutions to address congestion align with the Environment and Sustainability, System Preservation, Economic Vitality, and System Efficiency Management and Operations planning factors.



Congestion in the Paia area, Maui.

- **Providing shoreline and hillside protection –** Many of Maui Island's communities are located on its coastal perimeter and connected by only one access road. If that roadway or any bridges along it are affected by shoreline erosion, rockfalls, heavy rains and flooding, or hillside slides then safety and operations would be impacted. Honoapiilani Highway between Maalaea and Launiupoko experiences shoreline erosion, while portions of Hana Highway and Piilani Highway are susceptible to landslides and rockfalls. On Molokai, there is significant shoreline erosion along Kamehameha V Highway on the southeast side of the island. Reinforcing or protecting these roads against dangers would help maintain reliable operations, while relocating roads where feasible would provide additional circulation and capacity. Solutions that help maintain operations during incidents align with the System Preservation, Security, and Safety planning factors.
- **Improving safety of nonmotorized modes –** Stakeholders have expressed a strong need for more bicycle lanes, shared use paths, sidewalks, and trails as well safer nonmotorized facilities. Improving these facilities and increasing visibility for users align with the Environment and Sustainability, Modal Integration, and Safety planning factors.



Bicycle lane separated from road, Maui.

- **Improving transit service –** Increasing transit service and improving facilities on which transit travels has been identified as a future need. Improving service and reliability, and making transit accessible to all populations align with the Modal Integration and Transportation Access Mobility planning factors.



Chapter IV

Potential Solutions

IV. Potential Solutions

Stakeholders and the planning team developed potential solutions to address the recognized needs and issues on the Islands of Maui, Molokai, and Lanai. The planning team then evaluated the solutions against the Plan goals and objectives to prioritize program recommendations.

Solution Development

After understanding the transportation issues and needs unique to the Islands of Maui, Molokai, and Lanai, 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 program reviews 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 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.



A public meeting was held on Maui to discuss the proposed plan.

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. Input was also gathered at individual stakeholder meetings. These inputs enabled the planning team to develop a broad range of potential projects and programs that would potentially address identified needs.



Maui TAC members provided technical input for the needs and potential solutions.



All input was considered when developing the list of potential solutions.

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 solution was evaluated against a set of six high-level criteria shown on Exhibit 4-1. These criteria were intended to eliminate solutions that were inconsistent with the fundamental goals and objectives of the Plan, conflicted with the overarching HDOT Highways 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 2.1 (to improve modal integration and provide a safe, Complete Streets system of motorized and nonmotorized options) is relatively important to the District of Maui. To evaluate potential solutions against this goal, specific criteria related to integrated modes and facilities were developed based on the Hawaii Complete Streets Final Legislative Report. Criteria included providing appropriate access and comfort for all users. Meeting these criteria would indicate the potential solution supports the goal of an integrated, safe, multimodal system on Maui, Molokai, and Lanai.

Goal 8.1 (to maintain a safe transportation system for all modes) is also important to the District of Maui. 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. Strategic actions were directly translated into criteria, including increased visibility, separated directional traffic, minimized or reduced potential vehicle conflicts on roadways, removal of fixed objects and steep grades from roadsides. Potential solutions that met one or more of these criteria would be 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 Process for Solution Evaluation and Results memorandum.

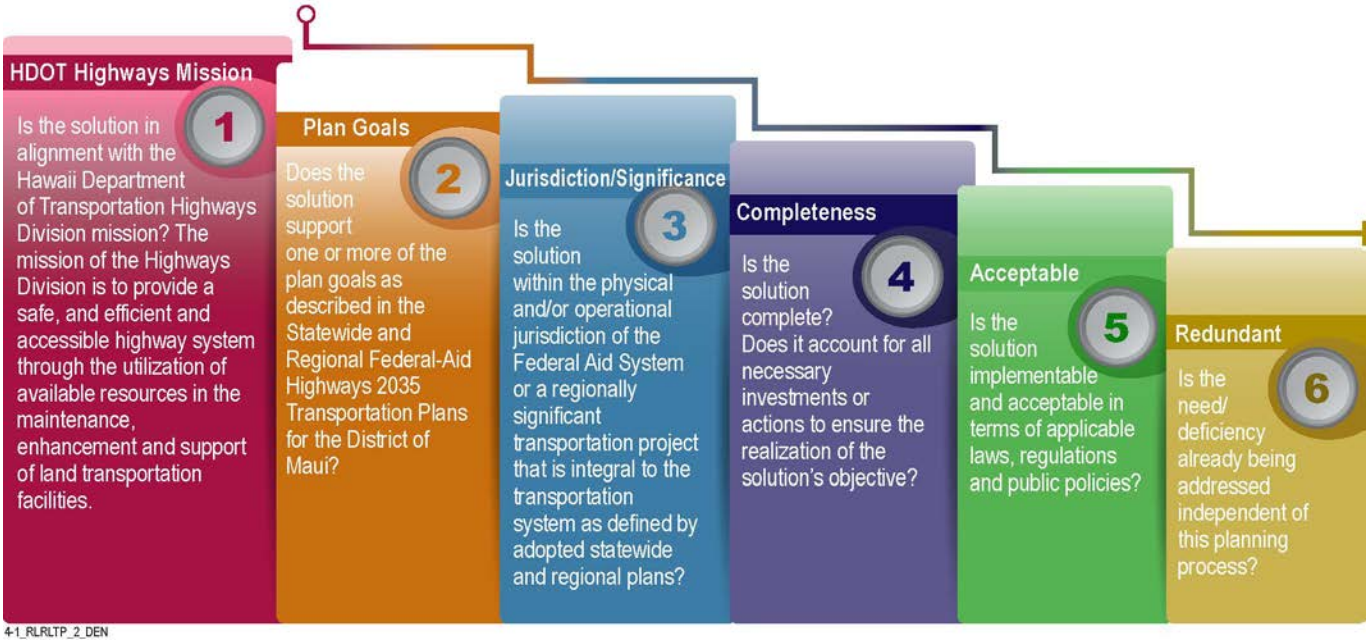
The grades assigned in Tier 2 evaluation measured how well a solution meets or addresses a specific Plan goal. The grades also showed the advantages and disadvantages of one solution relative to another. For stakeholders, the grades provided a means of seeing tradeoffs among solutions, thereby making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

The Tier 2 evaluation criteria grades are as follows:

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



Exhibit 4-1. Tier 1 Evaluation Criteria



After the planning team assigned Tier 2 evaluation grades for each goal, the team multiplied the grades by two weights: (1) the Maui District 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; and

(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:			
Project Location:		Cost Estimate	$0.000
Jurisdiction:			
Project Type:			
Project Description:			

Goal Rating is calculated by the formula: (Goal Priority Weight X Planning Factor Weight) X Evaluation Grade = Goal Rating

1. Environment and Sustainability Goal Number	Goal Description	Kauai Region Goal Priority Weight	Statewide Planning Factor Weight	Evaluation Grade	Goal Rating
1.1	Preserve and enhance the natural environment, including biological and aesthetic resources.	4%	4%		0.000
1.2	Preserve and enhance Hawaii's cultural resources 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%			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**	**Kauai Region Goal Priority Weight**	**Statewide Planning Factor Weight**	**Evaluation Grade**	**Goal Rating**
2.1	Provide a Complete Streets transportation system of motorized and non-motorized options.	7%	7%		0.000
2.2	Promote efficient travel between modes by creating connections and removing barriers.	3%			0.000
2.3	Promote safe modal connections between transportation alternatives.	3%			0.000
3. System Preservation **Goal Number**	**Goal Description**	**Kauai Region Goal Priority Weight**	**Statewide Planning Factor Weight**	**Evaluation Grade**	**Goal Rating**
3.1	Manage transportation assets and optimize investments.	3%	31%		0.000
3.2	Maintain safe, efficient, complete transportation system for the long-term.	8%			0.000
4. Security **Goal Number**	**Goal Description**	**Kauai 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.	6%	1%		0.000
4.2	Improve resiliency of the State through the transportation system.	4%			0.000
5. Economic Vitality **Goal Number**	**Goal Description**	**Kauai 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 Management and Operations **Goal Number**	**Goal Description**	**Kauai 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 benefit.	7%	18%		0.000
7. Transportation Access Mobility **Goal Number**	**Goal Description**	**Kauai 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%	2%		0.000
7.2	Ensure transportation investments in programs and prioritization processes are balanced (across modes and demographics i.e. serves EJ populations).	3%			0.000
8. Safety **Goal Number**	**Goal Description**	**Kauai Region Goal Priority Weight**	**Statewide Planning Factor Weight**	**Evaluation Grade**	**Goal Rating**
8.1	Maintain a safe transportation system for all modes.	8%	19%		0.000
8.2	Improve safety of the community through connectivity of the transportation infrastructure.	4%			0.000
9. Additional Goals, Objectives and Strategies **Goal Number**	**Goal Description**	**Kauai Region Goal Priority Weight**	**Statewide Planning Factor Weight**	**Evaluation Grade**	**Goal Rating**
9.1	Obtain sufficient and specific transportation funding.	7%	1%		0.000
9.2	Optimize project delivery.	3%			0.000
9.3	Provide 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 Maui 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 the District of Maui's federal-aid highways. The types of potential solutions relating to each priority goal are described below.

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

Improving modal integration and promoting safe, efficient connections are key goals for Maui, Molokai, and Lanai. Potential modal integration projects within the district include more bicycle lanes, sidewalks, and shared paths exclusively meant for nonmotorized modes. Multimodal projects also include completion of nonmotorized networks and improved, safer connections between different modes of travel and preservation of existing facilities. These types of projects are typically integrated into existing state or county programs, such as those focused on system preservation, safety, and capacity. These programs, and their specific subprograms, are responsible for prioritizing and implementing multimodal projects.



Sidewalks provide pedestrians separation from motorized vehicles.

» **Safety projects** include both infrastructure and non-infrastructure projects and would benefit both vehicles and nonmotorized modes. Infrastructure project examples include installing warning signage or lighting along roads to increase visibility of all modes. It also includes upgrading roadway curves or

intersection geometry to address documented high-accident locations. Additional safety projects also include installing guardrail, providing passing lanes, or widening existing shoulders to give greater distance between vehicles and reduce conflicts.

Maintaining the integrity of roadway features like embankments, slopes, and retaining walls prevent flooding, erosion, or rock slides, which could damage vehicles and put drivers at risk, as well as block traffic and cause congestion. Stabilizing embankments would prevent shoreline erosion and may protect against potential road failure caused by rising sea levels.

Safe access to schools is an important need that can be addressed with potential solutions such as clearly marked crosswalks with signals.

Potential non-infrastructure safety projects include enforcement efforts to reduce speeding or distracted driving and educational campaigns or outreach programs to share the benefits of safe driving. These often require multiagency coordination. In general, most safety projects support modal integration.



Highly visible pedestrian crosswalk signs are a potential safety solution.

Safety solutions were 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 Maui 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. Example safety subprograms include those focused on nonmotorized needs, rockfall and slope stabilization, shoreline protection, and guardrail and shoulder improvements. These particular subprograms align with the types of identified needs and potential solutions described above.

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 traffic performance to further improve safety conditions.

The safety solutions guidance provided in this Plan could serve as input to the HDOT and county safety programs and subprograms; from here the subprograms will use existing processes to best prioritize solutions for identified safety needs on Maui, Molokai, and Lanai.

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

Preserving the islands' transportation system also 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.



Lahaina Bypass, Kahoma Stream Bridge.

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 District of Maui already have system preservation programs. These system preservation programs are responsible for reviewing and prioritizing preservation solutions.

Within these overarching programs, multiple subprograms are designed to manage specific assets, such as pavement or bridges. The HDOT pavement subprograms keep track of roadway conditions on Maui, Molokai, and Lanai, and strive to extend the life of those roadways through various preservation actions. Specific subprograms that address pavement needs include the resurfacing, rehabilitation and repairs, reconstruction and replacement, and preventative maintenance subprograms.

Bridges are important assets and can be critical infrastructures. Multiple subprograms are in place to manage and maintain the district's bridge inventory. Bridge needs can arise for example 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, or seismic retrofit. The potential system preservation solutions developed and evaluated as part of this Plan will serve as input to these state and county programs and subprograms.

» **Security and resiliency projects** improve the ability of the district's roadways to provide reliable operations during threats or emergencies, and to support response or evacuation during natural disasters. These types of projects also address climate change and rising sea levels, which is especially important to the Maui District due to shoreline erosion issues, such as along Honoapiilani Highway. The limited availability of alternate routes on Maui, Molokai, or Lanai due to topography could make emergency response a challenge. Improving and maintaining the existing critical facilities to provide continual emergency access during hazard events is crucial to residents and visitors.



Sea-level rise will affect Honoapiilani Highway along the shoreline.

Roadways and facilities to address emergency access needs are typically addressed by projects in the state and county's system preservation, safety, efficiency management, and capacity program categories.

» **Capacity projects** 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. Capacity projects can support economic vitality, an important goal for Maui District, by reducing congestion near the

major airports and harbors and potentially providing more reliable travel times for freight vehicles throughout the islands. Although economic growth is dependent on the tourism industry, roadway and nonmotorized capacity projects would benefit 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 system. System management projects could include traffic signal revision or access controls to manage vehicle flows.

Roadway infrastructure capacity project solutions that ranked relatively high in Tier 2 evaluation involved additional lanes on existing highways, constructing new highways or by-pass roads, and adding or improving facilities for nonmotorized modes on shared roadways. Capacity solutions may also include bypass road or alternate route for resiliency. These solutions are shown on Exhibit 4-4 and are organized by State Route number where applicable.



Kaahumanu Avenue is a highly used roadway on Maui.

Based on the Tier 2 evaluation scores, the capacity projects included in the Exhibit 4-4 "short list" address the needs of the region and meet the roadway infrastructure goals of the Plan most effectively. These infrastructure solutions serve as suggestions to the state's existing capacity program, and should be considered, in addition to safety and nonmotorized capacity solutions, to address roadway deficiencies through 2035.

» **Transit projects** are key contributors to helping Maui District achieve its future multimodal goals, as well as other goals and objectives such as increasing transportation access and mobility for people who are unable or choose not to drive, integrating modes to increase transportation choice, reducing congestion, supporting economic vitality, and improving safety. Expanded and comprehensive transit systems can extend the length of bicyclist and pedestrian trips, opening up more destinations for those modes. Transit vehicles can 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 for Maui include increased frequency, expanded service to new areas of the island, transit hubs at key locations, improved sidewalk and bicycle connections to transit stops and major hubs from residential and commercial areas, increased amenities at transit stops including shelters and benches, where appropriate, and development of corridors to support mass transit. Additional transit infrastructure projects to address future ridership include new park-and-ride locations, upgraded bus stops, and/or new bus shelters. On Molokai, transit solutions could include shuttles between the airport and the harbor, or on-call service to support residents who do not drive. Transit service and transit-related projects are implemented by the county's transit agency, the Maui Department of Transportation.

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 General Fund, the County gas tax, and by the Federal Transit Administration (FTA). Additional revenues from fare collections are deposited in the County of Maui Highway Fund along with gas tax revenues, and account for approximately 20 percent of the operating costs of

Maui Bus services. Fares help to support Maui Bus public transit operations, however human services transportation is completely funded by the County of Maui with no fares charged to riders.

The County of Maui Department of Transportation (MDOT) oversees transit operations that are contracted to vendors for the Maui Bus public transit system (commuter, fixed route, and Americans with Disabilities Act (ADA) paratransit services) and human services transit. The department establishes priorities based on public demand through the County of Maui's annual budget process in addition to input from various community groups and the general ridership.



A double-decker Maui bus.

Based on MDOT's current annual budget, Maui Bus public transit costs are approximately $10.7 million, with human services transportation costs budgeted at $5.8 million. Annual passenger boardings are expected to reach 2.5 million, which includes trip counts for more than 750 qualified paratransit riders.

Current FTA funding includes approximately $3.84 million allocated for the purchase of ten new 32-passenger transit buses and roughly $500,000 per year to help defray the county's operational costs associated with providing ADA paratransit services, which are approximately $2 million annually. The HDOT does not fund or set priorities for Maui Bus transit operations.

The Maui Bus currently operates 13 fixed routes throughout Maui seven days a week, as well as daily commuter services (morning and evening peak periods) and ADA paratransit services.

MDOT's plans for transit include adding additional routes to serve transit-dependent populations, adding bus stops and signs, and providing informational and transit-related improvements (shelters, benches, bicycle racks, trash receptacles, solar lighting, web-based data, new transit vehicles, fare box upgrades, and communication interactivity). Transit hubs are also planned for key locations to improve services and aid in the formation of partnerships to enhance amenities and services to the growing ridership.

Transit is correlated with other Plan goals: 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 project 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 (FY) 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 project team first considered solutions with the highest Tier 2 evaluation ranking to include in the long-range set of solutions. 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 Maui 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 Maui District's priority goals, but are 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 for the district.

Based on current dollars, implementing the recommended list of long-range potential solutions would cost approximately $3.7B. 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 $3.7 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 in Exhibit 4-3. System preservation projects would cost roughly $406 million, or approximately 13 percent of the total unconstrained cost, while safety related projects for all modes would cost $680 million, or nearly 22 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 and alternate access in addition to capacity.

Unconstrained capacity solutions would cost $2.5 billion in current year dollars, or over 60 percent of the total cost. Potential solutions to address congestion would cost around $60 million, while other solutions, such as circulation or access studies and landscaping or aesthetic projects, would cost $60 million.

Exhibit 4-3. Plan Cost Estimates by Funding Program

Funding Program	Plan Cost Estimates
System Preservation	$406 M
Safety	$680 M
Capacity (non-constrained)	$2.5 B
Congestion	$60 M
Other	$60 M
TOTAL	**$3.7 B**

Implementing the roadway infrastructure capacity solutions on the short/constrained list shown in Exhibit 4-4 would require over $1.3 billion in current year dollars. These project solutions are identified separately due to their relatively large scale; these projects could cost more and take longer to implement than other capacity projects and projects in other programs.

They do not represent the only priority capacity solutions for Maui, Molokai or Lanai. 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 district's land transportation system. The cost of implementing the full array of capacity solutions to address anticipated deficiencies would be approximately $2.5 billion through 2035.

Based on the high estimated cost of addressing the 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 ($)
30	State	Honoapiilani Highway - Maalaea to Launiupoko	Additional 2 travel lanes	$650,000,000
30	State	Honoapiilani Highway - Wailuku to Maalaea	Additional 2 travel lanes	$121,430,000
31	State/ (developer)	Piilani Highway - Kilohana to Wailea	Additional 2 travel lanes	$32,656,000
32	State	Kaahumanu Avenue	Additional 2 travel lanes with bike lanes, sidewalks, and intersection improvements	$65,624,000
37	State	Kula Highway - Kula Junction to Pulehu Road	Additional 2 travel lanes	$104,498,000
37	State	Haleakala Highway – Old Haleakala Highway to Kula Highway/Highway 377	Additional one travel lanes	$25,115,000
311	State	Mokulele Highway – Kuihelani Highway to Piilani Highway	Additional 2 travel lane	$173,001,000
3000	State	Honoapiilani Highway (Lahaina Bypass) Phase 1B2 - Hokiokio Place to southern terminus	Construct a new 2-lane bypass roadway between Hokiokio Place and southern terminus on Honoapiilani Highway	$49,000,000
3000	State	Honoapiilani Highway (Lahaina Bypass) Phase 1D - Kaanapali Connector to northern terminus	Construct a new 2-lane bypass roadway between Kaanapali Connector and northern terminus on Honoapiilani Highway	$131,000,000
3000	State	Honoapiilani Highway (Lahaina Bypass) Phase 1C - Keawe Street Extension to Kaanapali Connector	Construct a new 2-lane bypass roadway between and Keawe Street and Kaanapali Connector	$40,000,000
3100	County	South Kihei Road from Longs Drugs (Piikea Avenue) to Lipoa Street	Additional 2 travel lanes with continuous center turn lane	$29,111,000
3115	County	North-South Collector Road - Uwapo Road to Wailea-Iki Drive	Complete the 2-lane collector roadway (parallel to Piilani Highway) from Uwapo Road to Wailea-Iki Drive	$51,144,000
3180	County	Waiale Drive - Kaahumanu Avenue to Honoapiilani Highway	Additional 2 travel lanes between Kaahumanu Avenue and Kuikahi Drive, extend from current terminus as 2-lane bypass road around Waikapu Village	$62,859,000
3800	State/ Airports	Kahului Airport Access Road - Hana Highway to Kahului Airport	Construct Phase 2 of the new airport access road	$55,000,000
n/a	State	Kihei to Upcountry connector - Piilani Highway to Haleakala Highway	Construct a new 2-lane collector roadway between Piilani Highway at Kaonoulu Street to Haleakala Highway at Haliimaile Road	$136,500,000
n/a	County	Maui Lani Parkway Extension - Kuihelani Highway to Mokulele Highway	Construct a 2-lane extension of Maui Lani Parkway to bypass Puunene Avenue and connect to Mokulele Highway	$24,046,000
n/a	County	Maui Lani Parkway Extension - Puumele Street to Kuikahi Drive	Construct a new 2-lane extension roadway from Puumele Street to Kuikahi Drive Extension	$19,237,000
n/a	County	Mill Street Extension - Lahainaluna Road to Aholo Road	Construct new 2-lane roadway from Lahainaluna Road to Aholo Road	$19,237,000
n/a (Future 3960)	County	Onehee Avenue - existing terminus to proposed Maui Lani Parkway Extension	Construct new 2-lane divided roadway extension with sidewalks to proposed Maui Lani Parkway Extension	$4,811,000
n/a	State	Paia Relief Route	Improve Hana Highway or construct a new 2-lane bypass roadway around Paia	$90,000,000



Exhibit 4-4. Potential Long-Range Capacity Solutions

Route Number	Jurisdiction	Project Title	Project Description	Estimated Cost FY 2011 ($)
n/a	County	Kihei Mauka Bypass - Mokulele Highway to Kanani Road	Construct a new 4-lane bypass roadway between Mokulele Highway (north of N. Kihei Road) and Kanani Road, realign N. Kihei road to new intersection	$127,859,000
n/a	County	Lower Main Street - Waena Street to Mill Street	Add one lane and provide center turn lane or separate left-turn lanes at major intersections	$14,584,000

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 twenty-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 Maui. 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 the 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 50 percent of the identified needs on Maui District. 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.

Statewide Transportation Improvement Program

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 National Highway System to ensure that investments in highway construction help achieve performance standards and state goals including infrastructure condition, safety, mobility, or freight movement. Similarly, the FTA prioritizes maintaining and operating the existing public transportation facilities and vehicles efficiently.

Exhibit 5-1. Implementation from Long-Range Plan to Statewide Transportation Improvement Program



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 Maui 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 Maui County fund allocations from Highways Division Programs, potential funding shortfalls, and possible contingency measures to mitigate funding gaps.

Federal Funding

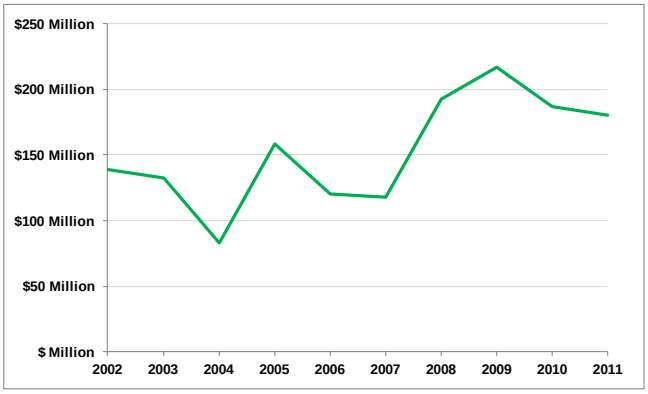
Historical Funding Levels

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 FY04 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 in the 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 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 (VMT) 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 FY 2014 without additional funds.

State Funding

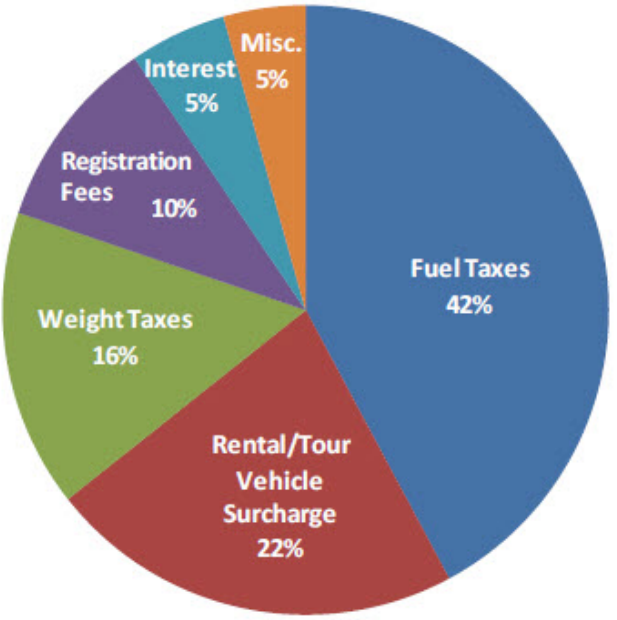
State funds come from six primary sources: fuel taxes, rental/tour vehicle surcharges, weight taxes, vehicle registration fees, miscellaneous fees, and interest from invested highway funds.

- **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 FY 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 FY 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 FY 2013. In FY 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 FY 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 FY 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.

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 FY2011.

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. FY2011 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 (FY 2011 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 State Transportation Improvement Program. 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 all 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, 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, Maui District has received approximately 23 percent of the State's Highways Division funds. Based on historic distributions, Maui District could expect to receive approximately $1.6 billion dollars (adjusted for inflation and expressed in FY2011 dollars) for transportation projects between FY11-FY35. As shown in Exhibit 5-4 and shared in Chapter 4, there is a $3.7 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	$406 M
Safety	$680 M
Capacity (non-constrained)	$2.5 B
Congestion	$60 M
Other	$60 M
TOTAL	**$3.7 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 Maui 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 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 modal integration and transit service (complete streets and safe, efficient modal connections).
- Maintain and improve safety for all modes.
- Preserve and maintain the existing transportation system.
- Promote resiliency and ability to respond to climate change.
- Support evacuation and emergency access/egress during incidents.
- Expand and increase regional economic vitality.
- Improve capacity and system efficiency by addressing congestion.

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 highways 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 this 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 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 pre-determined 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 Anticipated Revenue Vehicle (GARVEE) bonds for highways and Grant Anticipation Notice (GAN) 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 funds.

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 work 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. Encourage more private bus vendors to supplement the county's bus network.
- **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 in 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 all 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.

Additional Strategies

This Plan provides the framework to prepare Maui 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 Maui 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 Maui 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.



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

LRLTP Planning Factors	MAP-21 Performance Goals
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.	**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



Chapter VI

References

VI. References

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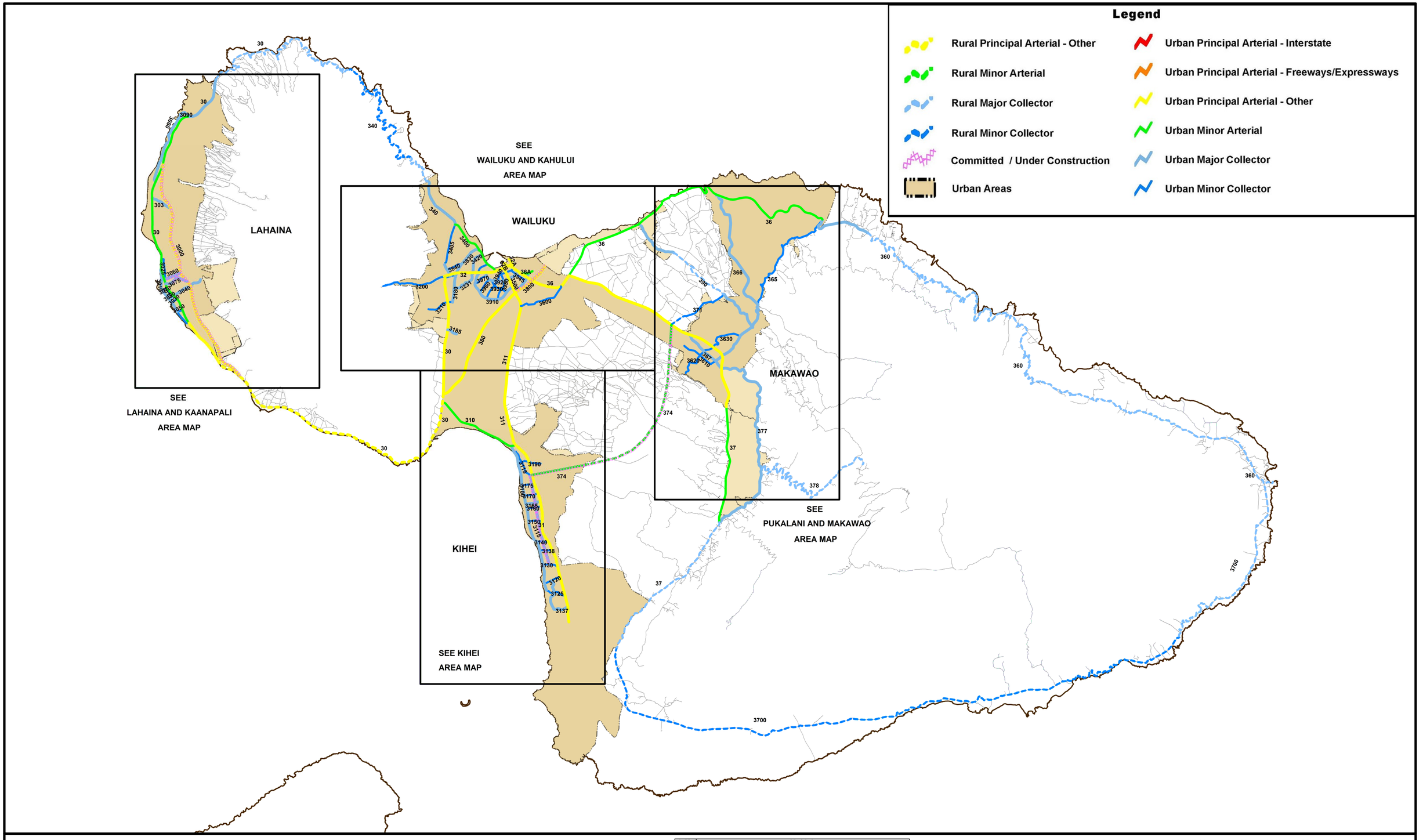
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Appendix A

Highway Functional Classification Maps



Legend
Rural Principal Arterial - Other
Rural Minor Arterial
Rural Major Collector
Rural Minor Collector
Committed / Under Construction
Urban Areas
Urban Principal Arterial - Interstate
Urban Principal Arterial - Freeways/Expressways
Urban Principal Arterial - Other
Urban Minor Arterial
Urban Major Collector
Urban Minor Collector

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SCALE 1" = 10,000'

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HIGHWAY FUNCTIONAL CLASSIFICATION MAP

KEY TO SHEETS

ISLAND OF MAUI

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HIGHWAYS DIVISION
HIGHWAY PLANNING BRANCH

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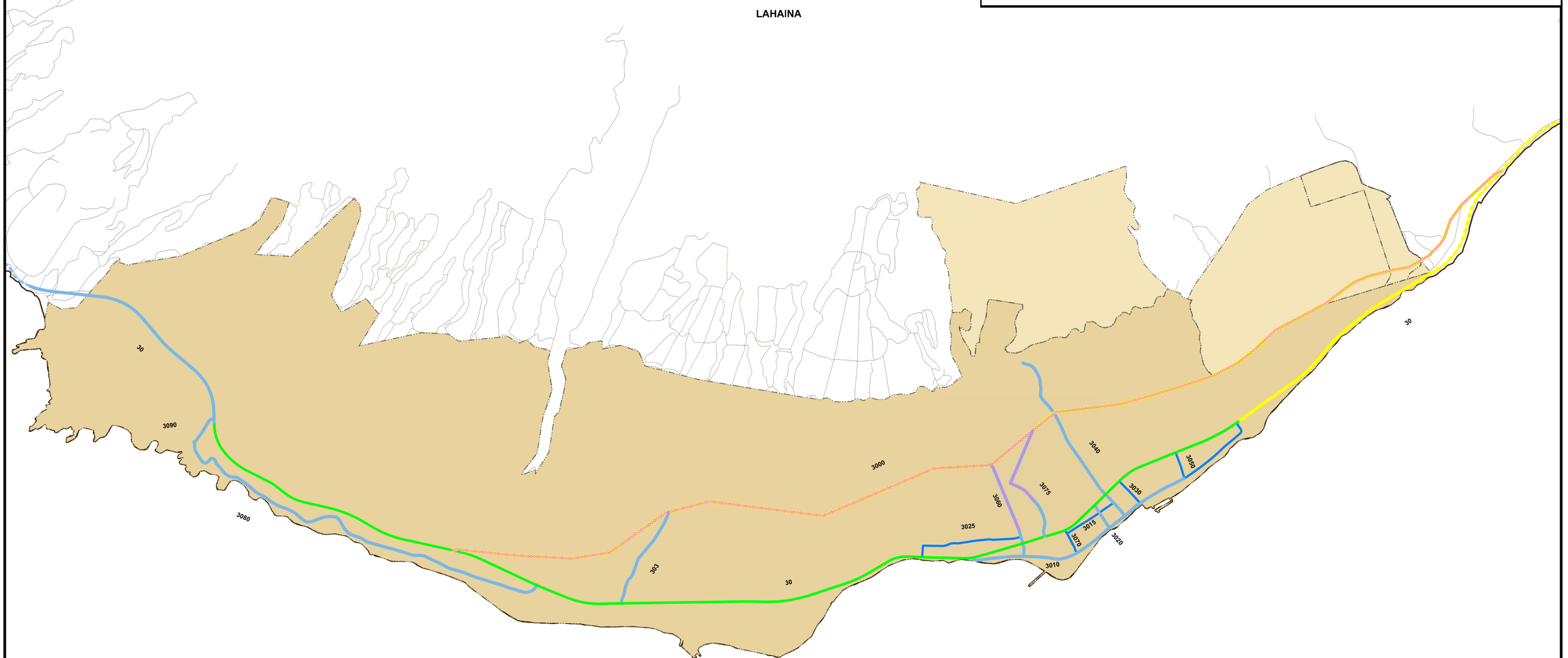
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

2013

Legend

- Rural Principal Arterial - Other
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Committed / Under Construction
- Urban Areas
- Urban Principal Arterial - Interstate
- Urban Principal Arterial - Freeways/Expressways
- Urban Principal Arterial - Other
- Urban Minor Arterial
- Urban Major Collector
- Urban Minor Collector

LAHAINA



Legend

- Rural Principal Arterial - Other
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Committed / Under Construction
- Urban Areas
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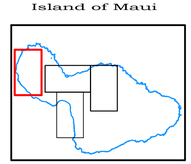
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LOCATION MAP
Island of Maui



HIGHWAY FUNCTIONAL CLASSIFICATION MAP

LAHAINA

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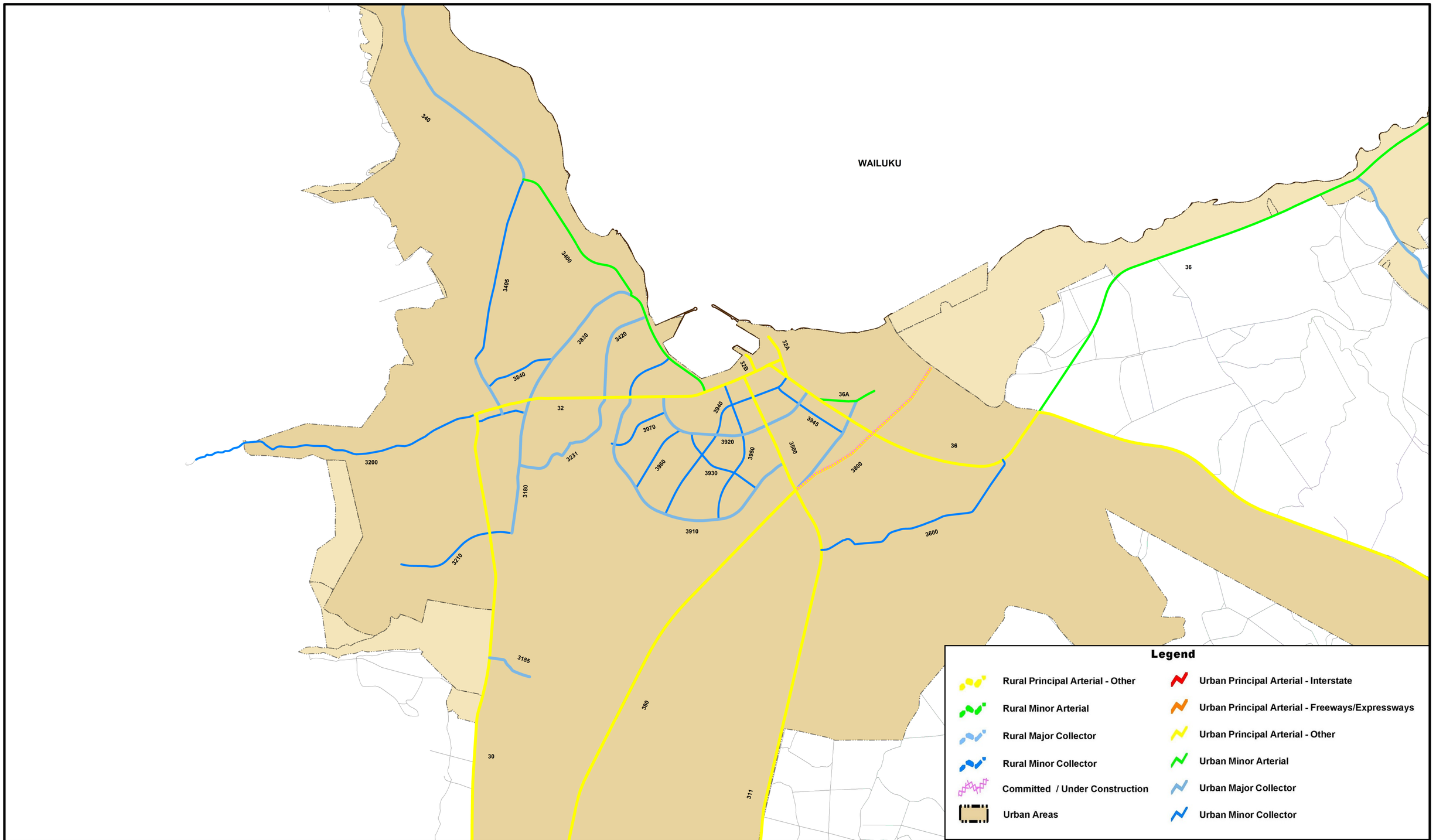
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2013

INSET MAP 1



Legend

- Rural Principal Arterial - Other
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Committed / Under Construction
- Urban Areas
- Urban Principal Arterial - Interstate
- Urban Principal Arterial - Freeways/Expressways
- Urban Principal Arterial - Other
- Urban Minor Arterial
- Urban Major Collector
- Urban Minor Collector

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LOCATION MAP
Island of Maui

HIGHWAY FUNCTIONAL CLASSIFICATION MAP

WAILUKU AND KAHULUI

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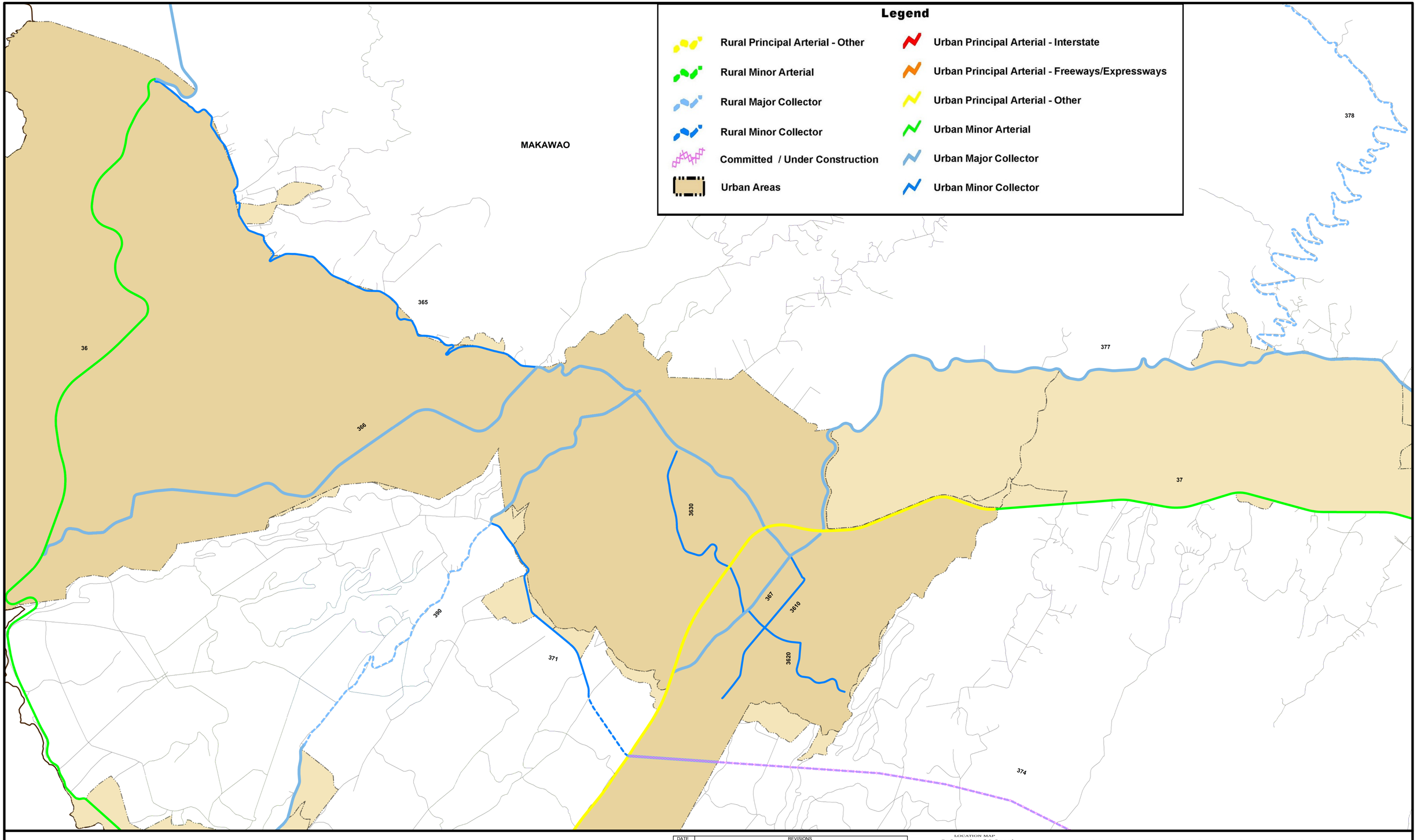
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INSET MAP 2



Legend

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- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Committed / Under Construction
- Urban Areas
- Urban Principal Arterial - Interstate
- Urban Principal Arterial - Freeways/Expressways
- Urban Principal Arterial - Other
- Urban Minor Arterial
- Urban Major Collector
- Urban Minor Collector

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LOCATION MAP
Island of Maui

HIGHWAY FUNCTIONAL CLASSIFICATION MAP

PUKALANI AND MAKAWAO

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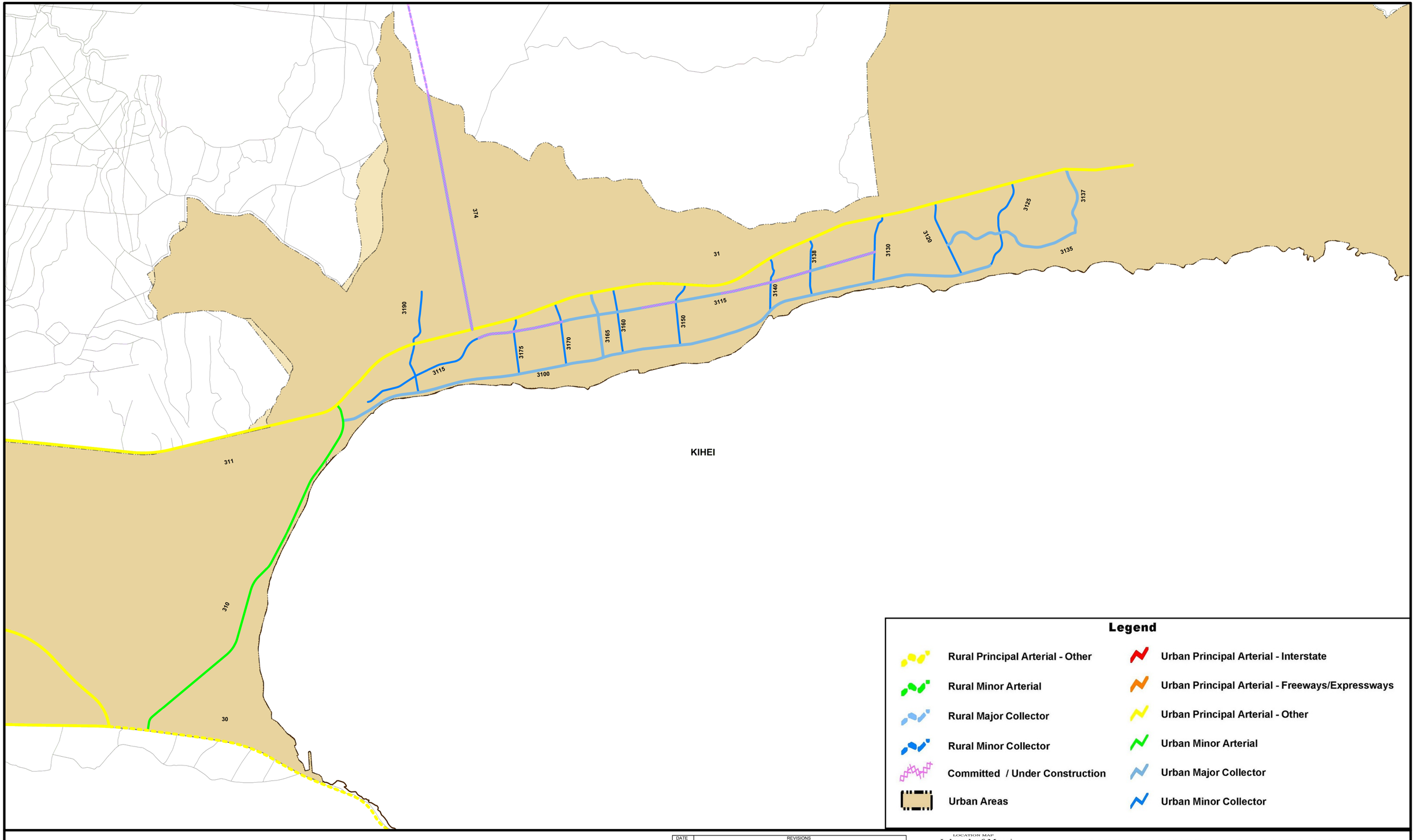
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INSET MAP 3



Legend

- Rural Principal Arterial - Other
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Committed / Under Construction
- Urban Areas
- Urban Principal Arterial - Interstate
- Urban Principal Arterial - Freeways/Expressways
- Urban Principal Arterial - Other
- Urban Minor Arterial
- Urban Major Collector
- Urban Minor Collector

Legend

Rural Principal Arterial - Other
Rural Minor Arterial
Rural Major Collector
Rural Minor Collector
Committed / Under Construction
Urban Areas
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Urban Minor Collector

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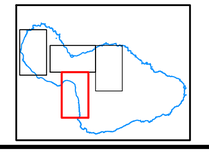
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LOCATION MAP
Island of Maui



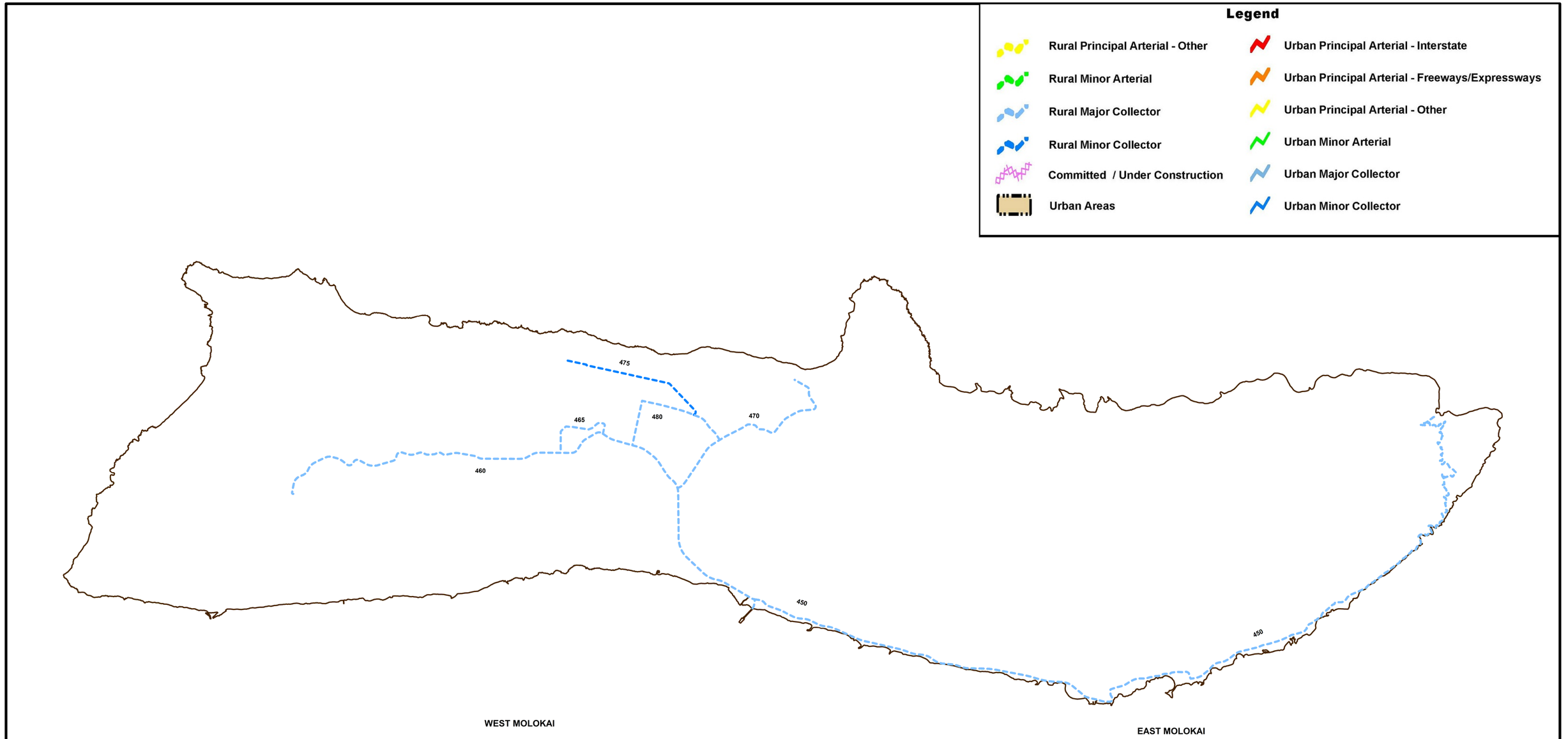
HIGHWAY FUNCTIONAL CLASSIFICATION MAP

KIHEI

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2013

INSET MAP 4



Legend

- Rural Principal Arterial - Other
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Committed / Under Construction
- Urban Areas
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- Urban Minor Collector

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HIGHWAY FUNCTIONAL CLASSIFICATION MAP

ISLAND OF MOLOKAI

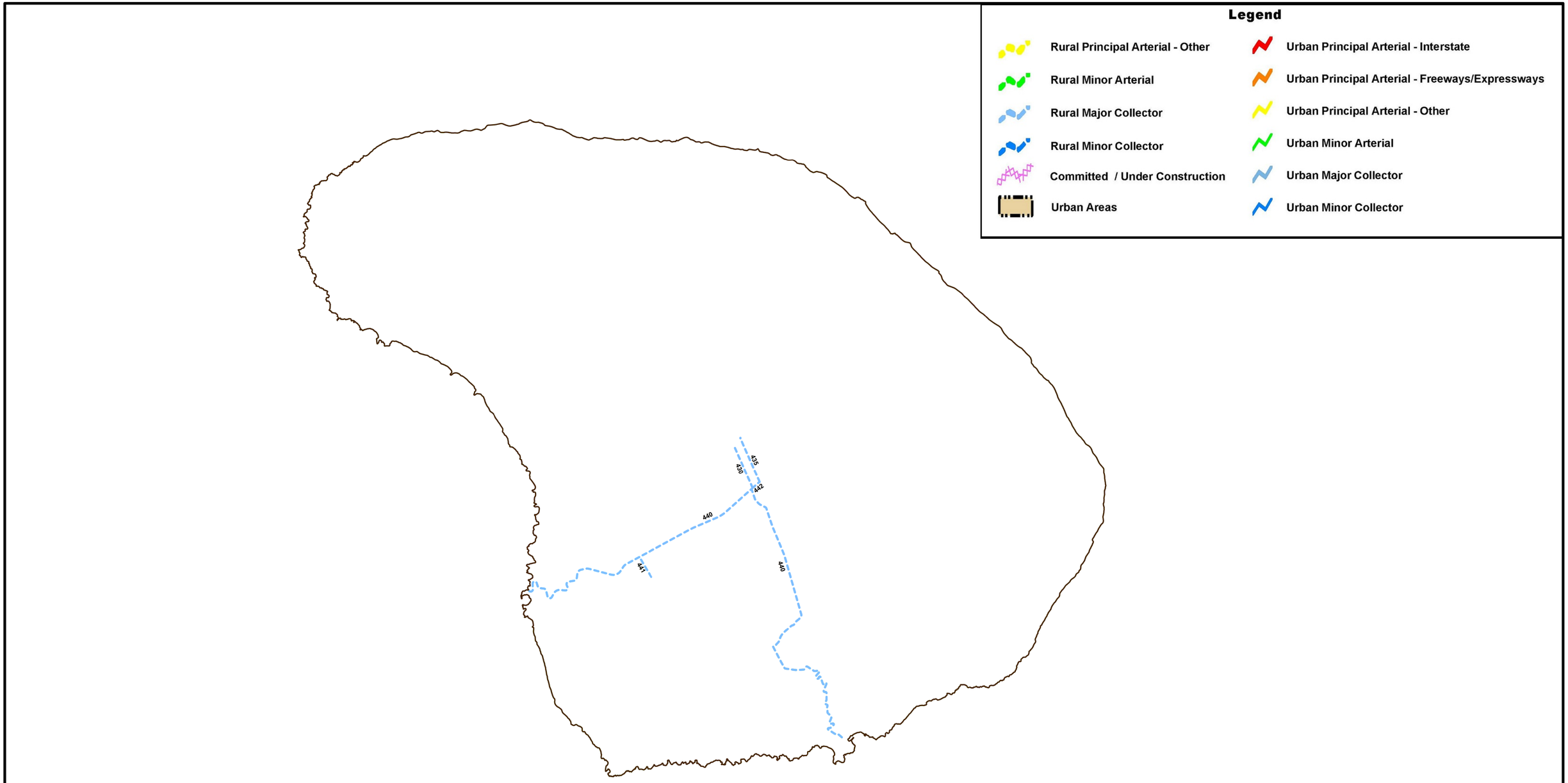
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FEDERAL HIGHWAY ADMINISTRATION

2013



Legend

- Rural Principal Arterial - Other
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
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- Urban Minor Collector

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HIGHWAY FUNCTIONAL CLASSIFICATION MAP

ISLAND OF LANAI

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FEDERAL HIGHWAY ADMINISTRATION

2013

Highway Functional Classification: Islands of Maui, Molokai, and Lanai

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
30	High Street/Honoapiilani Highway: Main Street (Route 32) > Kuihelani Highway (Route 380)	0.00	4.88	3	Urban NHS			4.88			
30	Honoapiilani Highway : Kuihelani Highway (Route 380) > proposed Lahaina Bypass (Route 3000)	4.88	17.65	3	Rural NHS			12.77			
30	Honoapiilani Highway : proposed Lahaina Bypass (Route 3000) > Front Street (Route 3010)	17.65	19.69	3	Urban NHS			2.04			
30	Honoapiilani Highway : Front Street (Route 3010) > Napilihau Street (Route 3090)	19.69	29.03	4	Urban				9.34		
30	Honoapiilani Highway : Napilihau Street (Route 3090) > Plantation Estates Drive	29.03	31.14	5	Urban					2.11	
30	Honoapiilani Highway/ Kahekili Highway : Plantation Estates Drive > end of state route (0.35 mi east of Papanahoa Stream Bridge (bridge #009000300304184)	31.14	41.67	5	Rural					10.53	
31	Piilani Highway : Mokulele Highway (Route 311) > Approx. 0.6 miles south of Wailea Ike Drive	0.00	7.75	3	Urban NHS			7.75			
32	West Main Street/Kaahumanu Avenue : High Street (Route 30) > Hobron Avenue (Route 32A)	0.00	2.85	3	Urban NHS			2.85			
36	Hana Highway : Kaahumanu Avenue (Route 32)> Haleakala Highway (Route 37)	0.00	2.92	3	Urban NHS			2.92			
36	Hana Highway : Haleakala Highway (Route 37) > Kaupakalua Road (Route 365)	2.92	16.23	4	Urban				13.31		
37	Haleakala Highway/Kula Highway: Hana Highway (Route 36) > Kalialinui Bridge (#009000370301383)	0.00	9.40	3	Urban NHS			9.40			
37	Kula Highway : Kalialinui Bridge (#009000370301383) > Kekaulike Avenue (Route 377)	9.40	14.25	4	Urban				4.85		
37	Kula Highway : Kekaulike Avenue (Route 377) > Old Makena Road	14.25	21.39	5	Rural					7.14	
303	Puukolii Road : Honoapiilani Highway (Route 30) > Lahaina Bypass (Route 3000)	0.00	0.80	5	Urban					0.80	
310	North Kihei Road : Honoapiilani Highway (Route 30) > Mokulele Highway (Route 311)	0.00	3.60	4	Urban				3.60		
311	Puunene Avenue/Mokulele Highway : Kuihelani Highway (Route 380) > Piilani Highway (Route 31)	0.00	6.41	3	Urban NHS			6.41			
340	Kahekili Highway : Waiehu Beach Road (Route 3400)> Waihee Bridge (#009003400500233)	0.00	2.31	5	Urban					2.31	
340	Kahekili Highway : Waihee Bridge (#009003400500233) > Camp Maluhia entrance	2.31	4.29	5	Rural					1.98	
340	Kahekili Highway : Camp Maluhia entrance > 0.35 miles east of Papanahoa Bridge (#009000300304184)	4.29	13.77	6	Rural						9.48
360	Hana Highway : Kaupakalua Road (Route 365) > Honokala Road	0.00	2.63	5	Urban					2.63	
360	Hana Highway/Keawa Place: Honokala Road > wharf at Hana Bay	2.63	34.93	5	Rural					32.30	
365	Makawao Avenue : Old Haleakala Highway (Route 367) > Kokomo Road (Route 366)	0.00	3.20	5	Urban					3.20	
365	Kaupakalua Road : Kokomo Road (Route 366) > Hana Highway (Route 36)	3.20	8.56	6	Urban						5.36

Source: Federal-Aid and State Highway Update: System Identification and Functional Classification (2013)

Highway Functional Classification: Islands of Maui, Molokai, and Lanai

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
366	Haiku Road / Kokomo Road: Hana Highway (Route 36) > Makawao Avenue (Route 365)	0.00	5.56	5	Urban					5.56	
367	Old Haleakala Highway : Haleakala Highway (Route 37) > Kula Highway (Route 37)	0.00	1.86	5	Urban					1.86	
371	Haliimaile Road : Haleakala Highway (Route 37) > Kailua Road	0.00	0.70	6	Rural						0.70
371	Haliimaile Road : Kailua Road > Baldwin Avenue (Route 390)	0.70	2.62	6	Urban						1.92
374	Kihei-Upcounty Maui Highway : Piilani Highway (Route 31) > Kihei Urban Boundary	0.00	2.60	4	Urban				2.60		
374	Kihei-Upcounty Maui Highway : Kihei Urban Boundary > Haleakala Highway (Route 37)/Haliimaile Road (Route 371)	2.60	9.80	4	Rural				7.20		
377	Haleakala Highway/Kekaulike Avenue : Kula Highway (Route 37) > Kula Highway (Route 37)	0.00	9.17	5	Urban					9.17	
378	Haleakala Crater Road : Hakeakala Highway (Route 377) > Haleakala National Park boundary (at the cattle guard near the "End State Hwy Sign")	0.00	10.15	5	Rural					10.15	
380	Dairy Road : Haleakala Highway (Route 36A) > Puunene Avenue (Route 3500)	0.00	0.96	5	Urban					0.96	
380	Kuihelani Highway : Puunene Avenue (Route 3500) > Honoapiilani Highway (Route 30)	0.96	6.18	3	Urban NHS			5.22			
390	Baldwin Avenue : Hana Highway (Route 36) > end of urban boundary	0.00	2.00	5	Urban					2.00	
390	Baldwin Avenue : end of urban boundary > Haliimaile Road (Route 371)	2.00	5.00	5	Rural					3.00	
390	Baldwin Avenue : Haliimaile Road (Route 371) > Makawao Avenue (Route 365)	5.00	6.94	5	Urban					1.94	
3000	Lahaina Bypass : Honoapiilani Highway S junction (Route 30) > Kahomo Stream [urban/rural boundary]	0.00	4.19	3	Urban NHS			4.19			
3000	Lahaina Bypass : Kahomo Stream [urban/rural boundary] > Honoapiilani Highway N junction (Route 30)	4.19	8.95	3	Rural NHS			4.76			
3010	Front Street : Honoapiilani Highway N Junction (Route 30) > Shaw Street (Route 3050)	0.00	1.97	5	Urban					1.97	
3010	Front Street : Shaw Street (Route 3050) > Honoapiilani Highway S Junction (Route 30)	1.97	2.67	6	Urban						0.70
3015	Wainee Street : Kenui Street (Route 3070) > Lahainaluna Road (Route 3040)	0.00	0.46	6	Urban						0.46
3020	Papalaua Street : Front Street (Route 3010) > Honoapiilani Highway (Route 30)	0.00	0.23	5	Urban					0.23	
3025	Kaniau Road/Ainakea Street : Honoapiilani Highway (Route 30) > Kapunakea Street (Route 3060)	0.00	0.92	6	Urban						0.92
3030	Dickenson Street : Front Street (Route 3010) > Honoapiilani Highway (Route 30)	0.00	0.27	6	Urban						0.27
3040	Lahainaluna Road : Front Street (Route 3010) > Lahainaluna School entry	0.00	1.63	5	Urban					1.63	
3050	Shaw Street : Front Street (Route 3010) > Honoapiilani Highway (Route 30)	0.00	0.20	6	Urban						0.20

Source: Federal-Aid and State Highway Update: System Identification and Functional Classification (2013)

Highway Functional Classification: Islands of Maui, Molokai, and Lanai

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
3060	Kapunakea Street : Front Street (Route 3010) > Lahaina Bypass (Route 3000)	0.00	0.80	5	Urban					0.80	
3070	Kenui Street : Front Street (Route 3010) > Honoapiilani Highway (Route 30)	0.00	0.20	6	Urban						0.20
3075	Keawe Street : Honopiilani Highway (Route 30) > Lahaina Bypass (Route 3000)	0.00	0.90	5	Urban					0.90	
3080	Lower Honoapiilani Road : Honoapiilani Highway (Route 30) > Napilihau Street (Route 3090)	0.00	3.32	5	Urban					3.32	
3090	Napilihau Street : Lower Honoapiilani Road (Route 3080) > Honoapiilani Highway (Route 30)	0.00	0.26	5	Urban					0.26	
3100	South Kihei Road : North Kihei Road (Route 310) > Okolani Drive (Route 3125)	0.00	6.22	5	Urban					6.22	
3115	Kenolio Road : Uwapo Road > Hoopili Akau Street	0.00	1.21	6	Urban						1.21
3115	North-South Connector: Kenolio Street > Keonekai Road	1.21	4.91	5	Urban					3.70	
3120	Kilohana Drive : Piilani Highway (Route 31) > South Kihei Road (Route 3100)	0.00	0.70	6	Urban						0.70
3125	Okolani Drive : Piilani Highway (Route 31) > South Kihei Road (Route 3100)	0.00	0.85	6	Urban						0.85
3130	Keonekai Road : Piilani Highway (Route 31) > South Kihei Road (Route 3100)	0.00	0.60	6	Urban						0.60
3135	Wailea Alanui Drive : Kilohana Drive (Route 3120) > Wailea Ike Drive (3137)	0.00	1.34	5	Urban					1.34	
3137	Wailea Ike Drive : Piilani Highway (Route 31) > Wailea Alanui Drive (Route 3135)	0.00	0.60	5	Urban					0.60	
3138	Alanui Ke Alii Drive: South Kihei Road (Route 3100) > Piilani Highway (Route 31)	0.00	0.50	6	Urban						0.50
3140	Kanani Road : Piilani Highway (Route 31) > South Kihei Road (Route 3100)	0.00	0.50	6	Urban						0.50
3150	Welakahao Road : South Kihei Road (Route 3100) > Piilani Highway (Route 31)	0.00	0.58	6	Urban						0.58
3160	Lipoa Street : Piilani Highway (Route 31) > South Kihei Road (Route 3100)	0.00	0.60	6	Urban						0.60
3165	Piikea Avenue: South Kihei Road (Route 3100) > Piilani Highway (Route 31)	0.00	0.60	5	Urban					0.60	
3170	Waipuilani Road : Piilani Highway (Route 31) > South Kihei Road (Route 3100)	0.00	0.60	6	Urban						0.60
3175	Kulanihakoi Street : Piilani Highway (Route 31) > South Kihei Road (Route 3100)	0.00	0.50	6	Urban						0.50
3180	Waiale Road: Wells Street (Route 3830) > Kuikahi Drive (Route 3210)	0.00	1.10	5	Urban					1.10	
3185	E. Waiko Road: Honoapiilani (Route 30) > Waiale Road	0.00	0.42	5	Urban					0.42	
3190	Ohukai Road : Hoalike Street > South Kihei Road (Route 3100)	0.00	0.97	6	Urban						0.97

Source: Federal-Aid and State Highway Update: System Identification and Functional Classification (2013)

Highway Functional Classification: Islands of Maui, Molokai, and Lanai

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						INTERSTATE	FREEWAY & EXPRESSWAY	ARTERIAL		COLLECTOR	
								PRINCIPAL	MINOR	MAJOR	MINOR
3200	West Main Street/Iao Valley Road : High Street (Route 30) > Iao Valley State Park	0.00	2.70	6	Urban						2.70
3210	Kuikahi Drive : South Alu Road > Waiale Road (Route 3180)	0.00	1.16	6	Urban						1.16
3231	Mahalani Street/Waiinu Road : Kaahumanu Avenue (Route 32) > Waiale Road (Route 3180)	0.00	1.18	5	Urban					1.18	
3400	Kahului Beach Road/Waiehu Beach Road : Kaahumanu Avenue (Route 32) > Kahekili Highway (Route 3405)	0.00	2.62	4	Urban				2.62		
3405	South Market Street/North Market Street : Wells Street (Route 3830) > Piihana Road	0.00	0.54	5	Urban					0.54	
3405	Kahekili Highway : Piihana Road > Waiehu Beach Road (Route 3400)	0.54	2.26	6	Urban						1.72
3410	Wahinepio Avenue : Kahului Beach Road (Route 3400) > Papa Avenue (Route 3910)	0.00	0.52	6	Urban						0.52
3420	Kanaloa Avenue : Kaahumanu Avenue (Route 32) > Kahului Beach Road (Route 3400)	0.00	0.90	5	Urban					0.90	
3500	Puunene Avenue : Kaahumanu Avenue (Route 32) > Kuihelani Highway (Route 380)	0.00	1.11	3	Urban NHS			1.11			
3600	Hansen Road: Mokulele Highway (Route 311) > Hana Highway (Route 36)	0.00	2.00	6	Urban						2.00
3610	Loha Street/Iolani Street : Old Haleakala Highway (Route 367) > End of Iolani Street	0.00	1.61	6	Urban						1.61
3620	Pukalani Street/Liholani Street : Old Haleakala Highway (Route 367) > Aina Lani Drive	0.00	1.40	6	Urban						1.40
3630	Makani Road : Old Haleakala Highway (Route 367) > Makawao Avenue (Route 365)	0.00	2.00	6	Urban						2.00
3700	Piilani Highway : Kula Highway (Route 37) > Haleakala National Park boundary	0.00	28.80	6	Rural						28.80
3700	Hana Highway : Haleakala National Park boundary > Keawa Place (Route 360)	28.80	38.59	5	Rural					9.79	
3800	Kahului Airport Access Road : Henaloa Street > Puunene Avenue (Route 3500)	0.00	1.67	3	Urban NHS			1.67			
3830	Wells Street : South High Street (Route 30) > Waiale Road (Route 3830)	0.00	0.44	6	Urban						0.44
3830	Waiale Road/East Main Street : Wells Street (Route 3830) > Waiehu Beach Road (Route 3400)	0.44	1.97	5	Urban					1.53	
3840	Mill Street : North Market Street (Route 3405) > East Main Street (Route 3830)	0.00	0.65	6	Urban						0.65
3910	Papa Avenue : Kaahumanu Avenue (Route 32) > Puunene Avenue (Route 3500)	0.00	2.56	5	Urban					2.56	
3920	Wakea Avenue : Kaahumanu Avenue (Route 32) > Hana Highway (Route 36)	0.00	1.65	5	Urban					1.65	
3930	Hina Avenue : Wakea Avenue (Route 3920) > Papa Avenue (Route 3910)	0.00	0.80	6	Urban						0.80

Source: Federal-Aid and State Highway Update: System Identification and Functional Classification (2013)

Highway Functional Classification: Islands of Maui, Molokai, and Lanai

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
3940	Kamehameha Avenue : Hana Highway (Route 36) > Papa Avenue (Route 3910)	0.00	1.75	6	Urban						1.75
3945	Alamaha Street : Kamehameha Avenue (Route 3940) > Dairy Road (Route 380)	0.00	0.70	6	Urban						0.70
3950	Lono Avenue : Kaahumanu Avenue (Route 32) > Papa Avenue (Route 3910)	0.00	1.30	6	Urban						1.30
3960	Onehee Avenue : Wakea Avenue > Papa Avenue (Route 3910)	0.00	0.66	6	Urban						0.66
3970	Kea Street : Wakea Avenue (Route 3920) > Papa Avenue (Route 3910)	0.00	0.60	6	Urban						0.60
32A	Hobron Avenue : Hana Highway (Route 36) > Kahului Harbor gate	0.00	0.41	3	Urban NHS			0.41			
32B	Wharf Street : Kaahumanu Avenue (Route 32) > Harbors Division lot Pier 2	0.00	0.17	3	Urban NHS			0.17			
36A	Haleakala Highway /Keolani Place : Hana Highway (Route 36) > Kahului Airport	0.00	0.51	4	Urban				0.51		
	MAUI										
	MOLOKAI										
450	Kamehameha V Highway : Ala Malama Avenue > end of pavement	0.00	27.51	5	Rural					27.51	
460	Kaunakai Place / Maunaloa Highway : beginning of state route > end of state route	0.00	16.56	5	Rural					16.56	
465	Airport Loop : Maunaloa Highway (east junction) > Maunaloa Highway (west junction)	0.00	2.13	5	Rural					2.13	
470	Kalae Highway : Maunaloa Highway (Route 460) > Kalaupapa lookout parking lot	0.00	5.79	5	Rural					5.79	
475	Lihi Pali Avenue/Puukapele Avenue : Farrington Highway (Route 480) > end of county route	0.00	4.06	6	Rural						4.06
480	Farrington Avenue/Puupeelua Avenue : Kalae Highway > Maunaloa Highway (Route 460)	0.00	3.66	5	Rural					3.66	
	LANAI										
430	Fraser Avenue : Kaumalapau Highway (Route 440) > Caldwell Avenue	0.00	0.90	5	Rural					0.90	
435	Lanai Avenue : Kaumalapau Highway > end of county route	0.00	1.00	5	Rural					1.00	
440	Kaumalapau Highway/Manele Road : Kaumalapau Harbor > Hulopooe Beach Park	0.00	13.18	5	Rural					13.18	
440c	Airport Road : airport terminal > Kaumalapau Highway (Route 440)	0.00	0.47	5	Rural					0.47	
442	Kaumalapau Highway : Manele Road (Route 440) > Lanai Avenue (Route 435)	0.00	0.20	5	Rural					0.20	

Source: Federal-Aid and State Highway Update: System Identification and Functional Classification (2013)



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
GOAL 1: Mobility and Accessibility Create and manage an integrated multimodal transportation system that provides mobility and accessibility for people and goods.	***Objective 1:*** 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. ***Objective 2:*** Ensure the provision of essential and critical air, land, and water transportation operations and services for all communities throughout the islands. ***Objective 3:*** 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. ***Objective 4:*** Address the special needs of Hawaii's underserved populations, including the elderly, disabled and Title VI/Environmental Justice (T6/EJ) populations. ***Objective 5:*** Reduce congestion in the air, water and land transportation systems.

Goals	Objectives
GOAL 2: Safety Enhance the safety of the air, land and water transportation systems.	***Objective 1:*** 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. ***Objective 2:*** Support and collaborate with all levels of government to identify transportation routes and protocols for the safe movement of hazardous materials. ***Objective 3:*** Continuously conduct assessment, preparedness, and emergency response for natural disasters as part of all planning efforts. ***Objective 4:*** Use and consider a full range of transportation design techniques to improve personal safety for all travelers.
GOAL 3: Security Ensure the secure operation and use of the air, land and water transportation systems.	***Objective 1:*** 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. ***Objective 2:*** Work with federal, state, and county agencies as well as tenants to conduct vulnerability and risk assessments. ***Objective 3:*** 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. ***Objective 4:*** Provide continuous monitoring of critical infrastructure and communications systems to provide for appropriate emergency response capability. ***Objective 5:*** Develop a biosecurity plan and measures to protect against pests and disease**.**
GOAL 4: Environment Protect Hawaii's unique environment and quality of life and mitigate any negative impacts.	***Objective 1:*** 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. ***Objective 2:*** 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." ***Objective 3:*** Assess sustainability and livability for air, land, and water transportation facilities and operation practices. ***Objective 4:*** Support the programs of state and federal natural resource agencies; and support ongoing lines of communication and coordination with these agencies. ***Objective 5:***

Goals	Objectives
	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. ***Objective 6:*** 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. ***Objective 7:*** 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. ***Objective 8:*** Prevent and minimize the transport of invasive species (pests and diseases).
GOAL 5: Economy Ensure that the air, land and water transportation facility systems support Hawaii's economy and future growth objectives.	***Objective 1:*** 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. ***Objective 2:*** 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. ***Objective 3:*** 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. ***Objective 4:*** Create modern air, land and water transportation systems that are part of a positive visitor experience.
GOAL 6: Energy 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.	***Objective 1:*** Support the national goal to reduce transportation-related greenhouse gas emissions and reliance on foreign oil. ***Objective 2:*** 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. ***Objective 3:*** 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. ***Objective 4:*** Expand the use of alternative fuel and electric vehicles; provide electric recharging at transportation facilities. ***Objective 5:***

Goals	Objectives
	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.
GOAL 7: Funding Create secure, flexible and sustainable revenues and funding sources for transportation needs.	***Objective 1:*** 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). ***Objective 2:*** Identify sources and develop and secure funding for the sustainable delivery, maintenance, operation, rehabilitation and replacement, and expansion of the state transportation systems. ***Objective 3:*** Ensure funding for the safety and security of the state transportation systems. ***Objective 4:*** 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. ***Objective 5:*** Study the reliability and viability of future transportation financing streams and funding and consider scenarios for innovative and nontraditional financing. ***Objective 6:*** Achieve project readiness in support of new funding sources as they become available; and report on achievements of project completion.
GOAL 8: Planning 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.	***Objective 1:*** Achieve the federal requirements for a comprehensive, cooperative and continuing (3C) transportation planning process; and continue to improve efficient and effective planning. ***Objective 2:*** Maintain a dynamic planning process that ensures coordination and cooperation between the state, federal, counties, private sector, and general public. ***Objective 3:*** 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. ***Objective 4:*** 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. ***Objective 5:*** Keep abreast of current and evolving programs and regulations that affect transportation in Hawaii. ***Objective 6:*** Seek wider application of geospatial technologies, further develop the land use database development, and integrate visioning in transportation planning.

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

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 Historic Park, and the Puukohola Heiau National Historic Site
- Maui: Haleakala National Park
- Molokai: Kalaupapa National Historic 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 Historic 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 Maui)

TO: State of Hawaii Department of Transportation (HDOT)

FROM: CH2M HILL

DATE: April 23, 2012

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:

- Reflect consistency through alignment of goals and objectives.
- Build effectively on previously adopted plans and policies.
- Comply with regional requirements.
- Have 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; however, they will vary based on regional priorities. These regional plans and policies 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 Maui (Plan).

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

- *Maui County General Plan – Countywide Policy Plan 2030* (2010)
- *Maui Island Plan General Plan 2030* (2012)

- Maui community plans (Hana, Kahoolawe, Lanai, Molokai, Kihei-Makena, Makawao-Pukalani-Kula, Paia-Haiku, Wailuku-Kahului and West Maui)
- *Maui Long-Range Land Transportation Plan* (1997)
- *Joint State/County Maui Interim Transportation Plan* (2002)
- *Maui County Short-Range Transit Plan* (2005)
- *Maui County Multi-Hazard Mitigation Plan* (2010 draft)
- *Molokai Long-Range Land Transportation Plan* (1997)
- *Kahului Commercial Harbor 2030 Master Plan and Draft Environmental Impact Statement* (2007)
- *Kahului Airport Master Plan* (1993)
- Kapalua Airport (no master plan available)
- *Hana Airport Master Plan* (1998)
- *Lanai Airport Master Plan Update* (1999)
- *Molokai Airport Master Plan* (1999)
- *Kalaupapa Airport Master Plan* (1990)
- Proposed Roadway Development Program (2007)
- Resolution No. 12-34, *Complete Streets Policy* (2012)
- *Final Environmental Impact Statement* [FEIS] *Honoapiilani Highway (FAP Route 30) Puamana to Honokowai* (1990)
- *Kihei Traffic Master Plan* (1996)
- *Update of Regional Transportation Forecasting Model for the Island of Maui: Model Methodology and Calibration Report* (2008)
- *Land Use Forecast, Island of Lanai, Maui County General Plan* (2012)
- *Maui National Wildlife Refuge Complex Comprehensive Conservation Plan and Environmental Assessment* (ongoing)
- County of Maui Budget, Fiscal Years 2011, 2012, and 2013, Capital Improvement Plan

Maui County General Plan 2030 – Countywide Policy Plan, County of Maui, 2010

Purpose and Content

The Maui Countywide Policy Plan provides a policy framework for the goals and policies that reflect the identified values of Maui County and future growth. The Countywide Policy Plan also serves as an overarching umbrella framework for the Maui Island Plan and Maui's nine community development plans (that is, Hana, Kahoolawe, Lanai, Molokai, Kihei-Makena, Makawao-Pukalani-Kula, Paia-Haiku, Wailuku-Kahului, and West Maui).

In terms of transportation, the Countywide Policy Plan acknowledges that diversification of the county's transportation network is essential to building capacity within the existing overtaxed transportation systems. The plan encourages coordination among the county, state, and federal governments to provide vehicular and nonmotorized options, including bikeways and pedestrian corridors, to move safely around the islands.

Findings Related to the Plan

The County General Plan has a broad range of goals and themes intended to describe conditions in the year 2030. A specific goal related to the long-range plan is to diversify transportation options within Maui County and to provide efficient, economical, and environmentally sensitive means of moving people and goods. Objectives of this plan are listed below, along with policies and actions that can help the county achieve this goal.

Objective

Provide an effective, affordable, and convenient ground transportation system that is environmentally sustainable.

Policies

- Execute planning strategies to reduce traffic congestion.
- Support the use of alternative roadway designs, such as traffic-calming techniques and modern roundabouts.
- Increase route and mode options in the ground transportation network.
- Ensure that roadway systems are safe, efficient, and maintained in good condition.
- Preserve roadway corridors that have historic, scenic, or unique physical attributes that enhance the character and scenic resources of communities.
- Promote a variety of affordable and convenient transportation services that meet countywide and community needs and expand ridership on transit systems.
- Provide and encourage the development of specialized transportation options for the young, the elderly, and persons with disabilities.
- Evaluate alternatives to preserve quality of life before widening roads.

Actions

- Establish efficient public-transit routes between employment centers and primary workforce residential areas.
- Create attractive, island-appropriate, conveniently located park-and-ride and ride-share facilities.

Objective

Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation.

Policies

- Make walking and bicycling transportation safe and easy between and within communities.
- Design new and retrofit existing rights-of-way with adequate sidewalks, bicycle lanes, or separated multi-use transit corridors.

Actions

- Design, build, and modify existing bikeways to improve safety and separation from automobiles.
- Increase enforcement to reduce abuse of bicycle and pedestrian lanes by motorized vehicles.
- Identify nonmotorized transportation options as a priority for new sources of funding.

Objective

Improve and expand the planning and management of transportation systems.

Policies

- Require new developments to contribute their pro rata share of local and regional infrastructure costs.
- Support the revision of roadway design criteria and standards so that roads are compatible with surrounding neighborhoods and the character of rural areas.
- Plan for multimodal transportation and utility corridors on each island.
- Use transportation demand management as an integral part of transportation planning.

The County General Plan focuses on an environmentally sustainable, multimodal ground-transportation system. Actions include enhancing transit operations, non-motorized facilities, and developing planning/design criteria and standards appropriate to the various Maui area contexts. This focus is a shift from the *Maui Long-Range Land Transportation Plan,* prepared in 1997, which had a major focus increasing vehicle capacity of the transportation system. The update of the plan will incorporate the desire for roadways that support transit, multimodal options, and island context.

Alignment with the Planning Factors

Key strategies of the Countywide Policy Plan align with multiple planning factors. The plan is closely aligned with the Environment and Sustainability and Transportation Access Mobility planning factors. It supports protecting the natural environment while also striving to diversify the county's transportation options to accommodate future growth. The policy also aligns with the Economic Vitality and Safety planning factors, as it recognizes that the tourism/visitor industry provides an important economic base for the county, and encourages providing safe and efficient means of travel for tourists and residents to move about the island.

Maui Island Plan General Plan 2030, County of Maui, 2012

Purpose and Content

The Maui Island Plan (MIP) establishes a directed growth strategy for the Island of Maui through the identification of nine community development plans that the county has identified as areas appropriate for future urbanization and revitalization. The Maui Island Plan is intended to serve as the central layer of framework that supports the Maui County General Plan. The Maui Island Plan developed a series of goals, objectives, policies, and action plan items for each element of the plan.

Findings Related to the Plan

The Island Plan includes recommendations for specific proposed highway improvements, and stresses preservation and improvement of the existing roadway system so that interconnected, efficient, multi-modal transportation options will be provided in the future. The plan also suggests integrating transportation and land use programs so that future development is complemented by safe, transit-friendly corridors. A transit-specific goal adopted by the general plan includes the development of an island-wide transit system that addresses the mobility needs of residents and tourists alike.

The MIP and the *Maui County General Plan 2030* have aligned goals that capture the values of the people throughout Maui. The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui will incorporate the desire for roadways that support transit, multimodal options, and island context.

Goals, objectives, and policies of the MIP are listed below:

Goal

An interconnected, efficient, and well-maintained, multimodal transportation system.

Objective

Provide for a more integrated island-wide transportation and land use planning program that reduces congestion and promotes more efficient (transit friendly) land use patterns.

Policies

- Plan for an integrated multimodal transportation system comprised of public transit, bicycle, pedestrian, automobile, and other transportation modes.
- Refocus transportation investment from the construction of additional roadways of for the automobile to the expansion of a multimodal transportation system.
- Encourage the use of Complete Streets design methods.
- Encourage employers to implement Transportation Demand Management strategies.

Objective

Safe and interconnected transit, roadway, bicycle, equestrian, and pedestrian networks.

Policies

- Ensure transit, roadway, and pedestrian facilities design and level-of-service standards respect the unique character of our communities.
- Prioritize transportation improvements list to cost-effectively meet existing and future needs consistent with the MIP.
- Require new development, where appropriate, to integrate sidewalks, pathways, bikeways, and transit infrastructure into new commercial and residential projects while enhancing community character.
- Identify and improve hazardous and substandard sections of roadways, drainage infrastructure, and bridges, provided that the historical integrity of the roads and bridges are protected.
- Consider identification, acquisition where appropriate, and use of abandoned right-of-ways for bikeways, pedestrian pathways, and open-space networks.
- Support the implementation of the *Central Maui Pedestrian and Bicycle Master Plan* (March 2012), when consistent with the MIP.

Objective

An island-wide multimodal transportation system that respects and enhances the natural environment, scenic views, and each community's character.

Policies

- Ensure that roadway and transit alignments respect the natural environment and scenic views.
- Ensure that roadways and transit systems in rural areas and small towns enhance community character.
- Design all transit systems to respect visual corridors and Maui's character.

Goal

An island-wide transit system that addresses the needs of residents and visitors and contributes to sustainable and livable communities.

Objective

An integrated transit system that better serves the mobility needs of Maui's residents and visitors.

Policies

- Maximize access to public transit in town centers, commercial districts, and employment centers.
- Expand regional/interregional transit services, where appropriate, in heavily traveled corridors and within communities
- Increase the frequency of current service, add additional bus routes as demand requires, and transition to nonpolluting transit vehicles, as funding permits.

- Provide adequate transit infrastructure (for example, bus pullouts, waiting benches and shelters, and signs) along current and future transit rights-of-way.
- Require new development where appropriate, to provide rights-of-way to accommodate transit circulation and support facilities.
- Identify, protect, and preserve, or acquire corridors for future inter-community transit use, including but not limited to, rail and also multimodal use corridors.
- Established transit corridors by planning for and secure appropriate right-of-way when appropriate for alternative modes of transportation (such as rail and water ferry service).
- Pursue improvements and upgrades to the existing transit system consistent with updated Maui DOT planning studies/transit plans (within the framework of comprehensive island-wide multimodal transportation plans)
- Increase interagency coordination between the Department of Planning, HDOT, County Department of Public Works, and other applicable agencies.

Objective

Plan for a more diversified and stable funding base to support transportation goals.

Policies

- Support alternative methods and sources of funding transportation improvements (including impact fees, higher taxes, fare adjustments, dedicated sources of funding, and assessments).
- Collaborate with public/private entities or nonprofit organizations to reduce public transit operational expenses.
- Coordinate with appropriate federal, state, and county agencies to fund transportation projects in areas where growth is anticipated.

Alignment with the Planning Factors

The MIP aligns with the Modal Integration planning factor. It promotes and encourages an island-wide transit/multimodal/intermodal system. It also aligns with the Environment and Sustainability factor through recognition that transportation planning is critical to maintaining the unique small-town character of the island while efficiently accommodating long-term growth.

Maui Community Plans: Hana (1994), Kahoolawe (1995), Lanai (1998), Molokai (2001), Kihei-Makena (1998), Makawao-Pukalani-Kula (1996), Paia-Haiku (1995), Wailuku-Kahului (2002), West Maui (1996), County of Maui

Purpose and Content

There are nine community plans in Maui County: Hana, Kahoolawe, Lanai, Molokai, Kihei-Makena, Makawao-Pukalani-Kula, Paia-Haiku, Wailuku-Kahului, and West Maui. Each of the plans reflects current and anticipated conditions, and advances planning goals, objectives, policies, and implementation considerations for the designated community.

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 was similar. Each plan included goals, objectives, policies, and implementing actions.

Goals, objectives, and policies of the various community plans relevant to the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui are listed in the table below.

Alignment with the Planning Factors

The community plans vary in their emphasis based on the context and priorities of the various communities. Similar to the General Plan and MIP, the community plans support Modal Integration with emphasis on pedestrian and bicycle transport. Certain communities also encourage inter-modal connectivity to airports and harbors, as well as transit service. The plans also align with the Environment and Sustainability planning factor through recognition that transportation combined with land use planning is critical to maintaining the unique character and cultural significance of the specific communities while efficiently accommodating long-term growth.

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment	Cultural Resources
Hana (County of Maui, 1994)	**Goal**: Harmony between the natural and constructed environments through building, infrastructure, and landscaping design which ensures that the natural beauty and character of the Hana region is preserved. **Objectives and Policies**: • Encourage roadway, drainage, landscaping, and other public improvement standards that are in harmony with an informal rural or natural environment. • Maintain the informal rural streetscape that provides character identification for Hana Town. • Preserve significant view corridors.	**Goal**: Timely and environmentally sensitive development and maintenance of infrastructure systems which protect and preserve the safety and health of the Hana region's residents and visitors, including the provision of domestic water, utility and waste disposal services, and effective transportation systems that meet the needs of residents and visitors while protecting the region's rural character. **Objectives and Policies**: • Ensure community participation, including resident Hawaiians, in long-term infrastructure planning. • Improve road conditions through more frequent resurfacing and repair. • Encourage a program of roadway safety improvements, including shoulder widening, pull-over spots, and installation of new signage and guardrails that do not detract from the region's scenic and rural character. • Balance traffic flow and safety requirements with the preservation of the Hana region's historic bridges. • Encourage the development of a quasi-public shuttle service to meet the intraregional and/or interregional transportation needs of the resident of the Hana Community Plan region. • Ensure that any master plan for the Hana Airport is consistent with the objectives and policies set forth in the Hana Community Plan.			**Goal**: Identification, preservation, protection and, where appropriate, restoration of significant cultural resources and practices, that provide a sense of history and identify for the Hana region. **Objectives and Policies**: • Encourage and protect traditional mauka and makai accesses for traditional cultural uses and practices.
Kahoolawe					
Lanai (County of Maui, 1998)	**Goal**: Preserve and enhance the unique urban design character of Lanai through consideration of planning, land use, and design standards that respect the island's rural plantation history. **Objectives and Policies**: • Establish design standards in the commercial/civic center area of Lanai City to provide special treatment in the maintenance and/or enhancement of the unique visual and physical identity of the town. • Provide additional landscaping in Lanai City to enhance the environment, using native and noninvasive climate adapted plants appropriate for the region. • Promote the development of a county urban design review process for proposed projects falling within the State Urban District. • Maintain existing road rights-of-way within Lanai City. • Encourage the development and use of subdivision and roadway design criteria and standards that are compatible with the rural character of Lanai. • Promote the appropriate use of street lighting to ensure public safety and to preserve the rural ambiance of Lanai.	**Goal**: Provide adequate reliable and well-designed public infrastructure systems in a timely fashion to meet the social, economic, and public safety and welfare needs of the Lanai community. **Objectives and Policies**: • Support and construct a paved by-pass road along the northern and western perimeter of Lanai City, connecting Kaumalapau Highway and Keomoku Road. • Establish a comprehensive transportation planning and management philosophy in keeping with the social, economic, and public safety needs of the island's residents. • Support roadway management policies that recognize the need to establish designated bus and truck traffic routes. • Encourage and support a pedestrian orientation for the Lanai City core. • Establish safe pathways connecting schools, recreation facilities, and commercial and residential areas for use by walkers, joggers and bicyclists. • Promote traffic safety through provision of roadway safety, maintenance and signage improvements, and through strict enforcement of traffic operating rules and regulations. • Ensure that planning, design, operation of, and access to airports and harbor facilities address the needs of the island's residents. • Maintain public access along agricultural roads and historic trails for hunting and access to coastal resources, hiking, and other outdoor activities.			

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment	Cultural Resources
	• Encourage the use of traffic management systems and techniques that eliminate the need for traffic signalization at major intersections. • Ensure that proposed land use patterns in Lanai City will preserve and complement the existing town design qualities.				
Molokai (County of Maui, 2001)	**Goal**: Harmony between the natural and constructed environments to ensure that the natural beauty and character of Molokai is preserved. **Objectives and Policies**: • Encourage grass swales and dry sump rather than curbs, gutters, and sidewalks for residential and rural areas. • Promote the maintenance of historic landscapes and streetscapes in character to the region.	**Goal**: Culturally and environmentally sensitive infrastructure systems, developed and maintained in a timely fashion, which protect and preserve the safety and health of Molokai residents and visitors. **Objectives and Policies**: • Improve and expand facilities at the existing airport rather than pursuing an alternate airport site. • Encourage the expansion of Kaunakakai Harbor. • Develop Hale O Lono Harbor for recreational purposes and ensure public access, while maintaining its ability to provide backup commercial capacity to Kaunakakai. • Develop off-street parking facilities in the Kaunakakai business district. • Improve traffic circulation in Kaunakakai by developing a new access road between mauka residential areas and Kamehameha V Highway. • Consider an additional access road to ford Kaunakakai gulch between Makaena Place and Manila Place concurrent with future expansion of Manila Camp. • Maintain the East End Highway at its current pavement width except for blind turns or other places necessary for public safety. Pedestrian trails, bikeways, jogging paths, and equestrian trails along highways. • Improve the maintenance of roads and shoulders, particularly for local streets in the Kaunakakai area. • Provide education and enforcement for a safe and litter-free highway system. • Encourage innovative and alternative traffic management strategies to avoid use of traffic lights. • Encourage the undergrounding of existing overhead utility lines as well as the provision of underground utility lines in major new developments. **Goal**: An efficient and responsive system of people-oriented public services that enable residents to live a safe, healthy, and enjoyable lifestyle. **Objectives and Policies**: • Provide and maintain recreational opportunities that address the needs of residents while respecting the rural character of Molokai. • Adopt a beach/mountain access dedication ordinance pursuant to Chapter 46 of Hawaii Statute, and acquire or improve public access (lateral shoreline access, beach access, mountain access). • Establish public vehicular access to Hale O Lono Harbor.	**Goal**: Enhance the unique qualities of the island of Molokai to provide future generations the opportunity to experience the rural and traditional lifestyles. **Objectives and Policies**: • Encourage alternative rural subdivision and roadway standards appropriate to Molokai. • Require infrastructure concurrency for all new development including but not limited to: school and park facilities, fire and police protection, roadways, water, and wastewater systems.	**Goal**: Preserve, protect and manage Molokai's exceptional natural land and water resources to ensure that future generations may continue to enjoy and protect the island environment. **Objectives and Policies**: • Recognize and preserve traditional access and uses of the environment to address subsistence needs of the residents of Molokai. • Preserve the island's scenic vistas and natural features, and maintain oceanview corridors along coastal roads.	

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment	Cultural Resources
Kihei-Makena (County of Maui, 1998)		**Goal**: Provide facility systems, public services, and capital improvement projects, in an efficient, reliable, cost effective, and environmentally sensitive manner that accommodates the needs of the Kihei-Makena community and fully supports present and planned land uses, especially in the case of project district implementation. Allow no development for which infrastructure may not be available concurrent with the development's impacts. **Objectives and Policies**: • Develop and implement a well-planned road and public transportation system to allow residents and visitors to move safely, effectively and comfortably within the region. • Undertake transportation system improvements concurrently with planned growth of the Kihei-Makena region. Require adequate interregional highway capacity, including the widening of Piilani and Mokulele Highways to four lanes, prior to the construction of major projects south of Kilohana Road or mauka of Piilani Highway. • Strengthen the coordination of land use planning and transportation planning to promote sustainable development and to reduce dependence on automobiles. New residential communities should provide convenient pedestrian and bicycle access between residences and neighborhood commercial areas, parks and public facilities. • Support ridesharing, bicycle and pedestrian use, alternative work schedules, traffic signal synchronization, and/or other transportation demand management strategies. • Support a new bypass highway mauka of Piilani Highway coordinated with a Maalaea-Kealia Pond bypass highway and an Upcountry-Kihei connector road to be constructed as growth in the region warrants. • Protect and preserve the traditional rural scale and character of existing portions of old Makena Road in a manner similar to that existing at Keawaiai Church. • Plan, design, and construct a pedestrian and bikeway network throughout the Kihei-Makena region which considers the utilization of existing stream beds, drainageways, wetlands, and public rights-of-way along coastal and inland areas. • Encourage joint public/private participation in the planning, design and construction of roadway improvements, especially those identified in this plan. • Support the planning and design of the Maalaea-Kealia bypass highway to address potential environmental concerns of North Kihei Road and its proximity to the shoreline.	**Goal**: A well-planned community with land use and development patterns designed to achieve the efficient and timely provision of infrastructural and community needs while preserving and enhancing the unique character of Maalaea, Kihei, Wailea, and Makena as well as the region's natural environment, marine resources, and traditional shoreline uses. **Objectives and Policies**: • Identify priority growth areas to focus public and private efforts on the provision of infrastructure and amenities to serve existing residents and to accommodate new growth. • Upon adoption of this plan, allow no further development unless infrastructure, public facilities, and services needed to service new development are available prior to our concurrent with the impacts of new development. • Establish a system of parks, utility easements, shoreline areas, drainageways and wetlands as an open space framework for the urban areas of the region, i.e. where structures exist or are planned to exist, and provide an integrated system of pedestrian and bicycle paths. • Establish a distribution of land uses that provides housing, jobs, shopping, open space, and recreation areas in close proximity to each other in order to enhance Kihei's neighborhoods and to minimize dependence on automobiles.	**Goal**: Preservation, protection, and enhancement of Kihei-Makena's unique and fragile environmental resources. **Objectives and Policies**: • Maintain and enhance the long-term availability of shoreline resources for public enjoyment through adequate access, space, and facility provisions, and through ongoing resource management programs. • Require that new shoreline development respect shoreline resources and maintain public access (shoreline erosion, stormwater runoff, resource management considerations).	**Goal**: Identification, preservation, enhancement, and appropriate use of cultural resources, cultural practice, and historic sites. **Objectives and Policies**: • Encourage and protect traditional mauka and makai accesses, cultural practices and rural lifestyles. • Preserve and restore historical roads and paths as cultural resources, and require such resources to be available to the public.

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment	Cultural Resources
Makawao-Pukalani-Kula (County of Maui, 1996)	**Goal**: Recognition and preservation of the unique design characteristics of the Makawao, Pukalani, and Kula communities in order to enhance Upcountry's constructed environment. **Objectives and Policies**: • Encourage urban design concepts that promote and produce pedestrian orientation, town centers, mixed land uses and energy conservation principles to enhance the identity and livability of new and existing communities. • Support the revision of subdivision and roadway design criteria and standards to be more compatible with the rural character of the Upcountry region. • Support the development of pedestrian, equestrian and bikeway connections that provide safe and convenient linkages within and between Upcountry communities. • Encourage the use of appropriate landscaping, with greenways where possible, along major roadways, parking areas and land use transition areas to establish and maintain landscape themes which are consistent with the character of each Upcountry community.	**Goal**: The timely and environmentally sensitive development and maintenance of infrastructure systems which protect and enhance safety and health of Upcountry's residents and visitors, including the provision of domestic water, utility and waste disposal services, and effective transportation systems that meet the needs of residents and visitors while maintaining the region's rural character. **Objectives and Policies**: • Ensure the safe and convenient movement of people and goods by providing maintained roadways having adequate carrying capacities. • Give priority to the "no-build" alternative of the proposed Upcountry-Kihei connector highway. • Support the planning of new roadways provided that there would be minimal impact to the Upcountry lifestyle and character. • Improve the road through Haliimaile. • Encourage and support alternative transportation programs that could include various methods of land use planning and urban design, which reduce reliance on the automobile as the primary mode of travel. • Support the establishment of a limited service public transportation system to key destinations within the Upcountry area to meet the needs of youth, after school needs of students, seniors and physically disabled. • Establish safe pathways connecting schools, recreation facilities, and commercial and residential centers for use by walkers, joggers, equestrians, and bicyclists. • Provide transportation improvements in accordance with the Americans with Disabilities Act, including sidewalks, bikeways, and other traffic safety improvements at existing and proposed school areas to ensure student safety. • Promote traffic safety through provision of roadway safety and maintenance improvements, and traffic control improvements throughout the region. • Recognize the need to establish designated truck routes. • Encourage urban design concepts which promote pedestrian orientation and mixed land uses to reduce automobile travel and promote energy conservation. • Achieve the energy-efficient movement of people and goods through improvements to the transportation systems serving the planning area.	**Goal**: The maintenance and enhancement of Upcountry's unique and diverse rural land use character with sensitivity to existing land use patterns, natural resource values, and economic and social needs of the region's residents. **Objectives & Policies**: • Encourage land use patterns which will support long-term viability of agriculture, discourage urban sprawl, discourage heavy industrial activities, discourage large-scale hotels, preserve and respect the Haleakala National Park, maintain a separation of character between the Upcountry and the Kihei-Makena regions. • Recognize the four semi-urban centers of Makawao Town, Pukalani, Haliimaile, and Waiakoa Village. Support the centralization of business activities and avoid the expansion of strip commercial development. Support land use spatial patterns that enhance the functional viability of pedestrian-oriented town and village centers.	**Goal**: Protection of Upcountry's natural resources and environment as a means of preserving and enhancing the region's unique beauty, serenity, ecology and productivity, in order that future generations may enjoy and appreciate an environment of equal or higher quality. **Objectives and Policies**: • Encourage federal, state, and county cooperation in the preparation of a comprehensive Haleakala summit master plan to promote orderly and sensitive development that is compatible with the natural and native Hawaiian cultural environment.	

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment	Cultural Resources
Paia-Haiku (County of Maui, 1995)	**Goal**: Attractive rural town development in keeping with the existing scale, form, and character of settlement areas in the region. **Objectives and Policies**: • Incorporate design standards, including but not limited to, lighting, building, and roadway design, appropriate for rural communities. • Establish in designated areas a neotraditional village form of development with defined growth limits and a core of low-rise mixed public, residential, and commercial uses organized and designed to enhance pedestrian and bicycle access.	**Goal**: Transportation systems that facilitate the safe and efficient movement of people, produce, and goods within and outside the region. **Objectives and Policies**: • Strongly encourage the coordinated efforts of all appropriate county, state, and federal agencies to plan, fund, and construct an alternate route around Paia Town. • Establish a regional network of bikeways and pedestrian paths. This should include providing adequate space to accommodate bicycle traffic throughout the Paia Town area, including along Baldwin Avenue from Paia to Makawao. • Encourage convenient pedestrian and bicycle access between residences and neighborhood commercial areas, parks, and public facilities, in order to minimize use of the automobile within residential communities. • Realign Hana Highway in the vicinity of Hookipa Park to provide an area for park expansion. • Discourage heavy truck traffic through Paia Town. **Goal**: Quality recreational facilities to meet the present and future needs of residents of all ages and physical ability with emphasis on securing shorefront lands. **Objectives and Policies**: • Develop a system of bicycle and pedestrian accesses along the shoreline, where practicable.	**Goal**: A well-planned community that preserves the region's small town ambiance and rural character, coastal scenic vistas, and extensive agricultural land use, and accommodates the future needs of residents at a sustainable rate of growth and in harmony with the region's natural environment, marine resources and traditional uses of the shoreline and mauka lands. **Objectives and Policies**: • When appropriate, incorporate low-rise town or village forms of development, such as the neotraditional town, with defined growth limits and a village core of mixed public, residential and commercial uses, organized and designed to enhance pedestrian and bicycle access as an alternative to linear forms of development, which are characteristic of more urban areas.	**Goal**: The preservation and protection of the natural environment, marine resources and scenic vistas to maintain the rural and natural ambiance and character of the region. **Objectives and Policies**: • Preserve and protect scenic vistas along Hana Highway.	**Goal**: Identification, protection, preservation, enhancement and appropriate use of cultural resources, cultural practices, and historic sites that provide a sense of history and define a sense of place for Paia-Haiku region. **Objectives and Policies**: • Encourage and protect traditional mauka and makai accesses, cultural practices, and rural lifestyles.
Wailuku-Kahului (County of Maui, 2002)	**Goal**: An attractive and functionally integrated urban environment that enhances neighborhood character, promotes quality design, defines a unified landscape planting and beautification theme along major public roads and highways, watercourses and at major public facilities and recognizes the historic importance and traditions of the region. **Objectives and Policies**: • Enhance the appearance of major public roads and highways in the region. • Improve pedestrian and bicycle access within the region. • Promote a unified street tree planting program along major highways and streets.	**Goal**: Timely and environmentally sound planning, development and maintenance of infrastructure systems that serve to protect and preserve the safety and health of the region's residents, commuters and visitors, through the provision of clean water, effective waste disposal and drainage systems, and efficient transportation systems which meet the needs of the community. **Objectives and Policies**: • Encourage the incorporation of drainageways, setbacks, and flood protection areas into greenways consisting of open space, pedestrian way, and bikeway networks. • Develop efficient circulation systems, public transportation and promote bicycle and pedestrian travel to reduce energy expenditures for travel. • Enhance circulation by improving road maintenance; improving or providing traffic signals and turning lanes at congested intersections; and by providing street and destination signs. • Provide bikeway and walkway systems in the Wailuku-Kahului area which offer safe and pleasant means of access, particularly along routes accessing residential districts, major community facilities and activity centers, school sites, and the shoreline between Kahului Harbor and Paia. • Support private efforts to expand public transit service. • For future residential development, prohibit direct lot access from primary roads. • Accommodate bicycle and pedestrian ways within planned improvements. • Support the extension of Kahului Airport runway, access road improvements, and other related facility improvements. • Support the expansion of Kahului Harbor. Allow recreational uses by canoe clubs or provide an alternative site, also incorporate safe bicycle and pedestrian	**Goal**: An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for the social and economic well-being of residents and the preservation and enhancement of the region's environmental resources and traditional towns and villages. **Objectives and Policies**: • Create a direct control overlay district in and around Kahului Airport due to the public investment and the economic importance of the facility. • Within the Wailuku Town core, formulate and implement flexible land use guidance policies that enhance the various activity centers and maintain the traditional character of the town. • Upon adoption of this plan, does not allow further development unless infrastructure, public facilities, and services are available prior to or concurrent with the impacts of new development.	**Goal**: A clean and attractive physical and natural environment in which man-made developments or alterations to the natural environment relate to sound environmental and ecological practices, and important scenic and open space resources are maintained for public use and enjoyment **Objectives and Policies**: • Promote the planting and maintenance of trees and other landscape planting to enhance the streetscapes and the built-environment.	**Goal**: Identification, protection, preservation, enhancement and appropriate use of cultural resources, cultural practices, and historic sites and structures, and cultural landscapes and view planes. **Objectives and Policies**: • Ensure that the proposed projects are compatible with neighboring historic, cultural, and archaeological sites or districts. • Preserve and restore historic roads, paths, and water systems as cultural resources, and support public access.

Community	Urban/Town Design	Physical/Social Infrastructure	Land Use	Environment	Cultural Resources
		access. Support the investigation of alternative sites for a second commercial harbor facility. • Support extension of Waiale Drive to a new intersection with Honoapiilani Highway. • Preserve Waiale Bridge • Preserve the character of Honoapiilani Highway between Waikap and Wailuku by maintaining two travel lanes and the existing trees.			
West Maui (County of Maui, 1996)	**Goal**: An attractive and functionally integrated urban environment that enhances neighborhood character, promotes quality design at the resort destinations of Kaanapali and Kapalua, defines a unified landscape planting and beautification theme along major public roads and highways, watercourses and at major public facilities and recognizes the historic importance and traditions of the region. **Objectives and Policies**: • Enhance the appearance of major public roads and highways in the region. • Maintain a high level of design quality for West Maui resort destination areas. • Improve pedestrian and bicycle access within the region. • Promote a unified street tree planting program along major highways and streets.	**Goal**: Timely and environmentally sound planning, development and maintenance of infrastructure systems that serve to protect and preserve the safety and health of the region's residents, commuters and visitors, through the provision of clean water, effective waste disposal and drainage systems, and efficient transportation systems which meet the needs of the community. **Objectives and Policies**: • Support construction of the planned Lahaina Bypass Road in such a way as to promote safe, efficient travel across the region without encouraging further urbanization or impeding agricultural operations. • Support the provision of an alternative route between West Maui and Central Maui • Support improvements for the safe and convenient movement of people and goods, pedestrians and bicyclists in the Lahaina region. • Support ridesharing, programs to promote safe bicycle and pedestrian travel, alternative work schedules, traffic signal synchronization, and other transportation demand management strategies. • Promote residential communities that provide convenient pedestrian and bicycle access between residences and neighborhood commercial areas, parks and public facilities, in order to minimize use of the automobile. • Provide landscaping along major local streets in Lahaina town to enhance the street level walking and driving experience, to aid in orientation, and to emphasize mauka-makai views. • Establish Front Street and Wainee Street as local roads within Lahaina Town with an emphasis on enhancing pedestrian and bicycle amenities. • Eliminate bus traffic on Front Street north of Dickenson Street. • Provide adequate facilities for marine related light industrial activities. • Maintain a community airstrip in the Mahinahina area and limit the current size, scale and level of services at the airstrip through conditional zoning. • Create a direct control overlay district in and around the Kapalua/West Maui Airport. **Goal**: Develop and maintain an efficient and responsive system of public services which promotes a safe, healthy, and enjoyable lifestyle, and offers opportunities for self-improvement and community well-being. **Objectives and Policies**: • Ensure adequate public access to suitable mauka recreational areas. • Ensure adequate public access to shoreline areas.	**Goal**: An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for stable social and economic well-being of residents and the preservation and enhancement of the region's open space areas and natural environment. **Objectives and Policies**: • Where possible, relocate the Honoapiilani Highway south of Puamana in order to reduce potential inundation and disruption of service due to storm-generated wave action.	**Goal**: A clean and attractive physical, natural and marine environment are based on sound environmental and ecological practices, and important scenic and open space resources are preserved and protected for public use and enjoyment **Objectives and Policies**: • Promote the planting of trees and other landscape planting to enhance the streetscapes and the built-environment. • Protect the shoreline and beaches by preserving waterfront land as open space wherever possible. (shoreline retreat & hazard buffer zone)	**Goal**: To preserve, protect and restore those cultural resources and sites that best represent and exemplify the Lahaina region's pre-contact, Hawaiian monarchy, missionary, and plantation history. **Objectives and Policies**: • Encourage and protect traditional shoreline and mountain access, cultural practices and rural/agricultural lifestyles. Ensure adequate access to our public shoreline areas for public recreation, including lateral continuity.

Maui Long-Range Land Transportation Plan, HDOT, April 1997

Purpose and Content

The Maui Long-Range Land Transportation Plan was developed in cooperation with the County of Maui. It serves as a guide to major surface transportation facilities and programs to year 2020. The plan is intended to identify long-range strategies and actions, as well as short-range improvements that will lead to the development of an integrated inter-modal transportation system that facilitates the efficient movement of people and goods.

The plan contains a financial element that identifies both current and potential future sources of revenue that may be available for implementation of the plan. Overall, $1.8 billion in the plan period was estimated.

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

Findings Related to the Plan

The recommended implementation plan is summarized in the tables below, which are excerpted directly from the plan.

TABLE 1
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 1996-2000

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 1996-2000				
S4	Honoapiilani Highway*	In Kaanapali, from Kaanapali Parkway to Lower Honoapiilani Road	Widen from two to four lanes	$9.8 [b]
S1	Kahului Beach Road*	In Wailuku, from Waiehu Beach Road to Kaahumanu Avenue	Widen from two to four lanes with separate left-turn lanes at major intersections	$5.2m
S2	Dairy Road*	In Kahului, from Hukilike Street to Haleakala Highway/Keolani Place	Widen from two to four lanes with separate left-turn lanes from Haleakala Highway to Hana Highway. Five lanes (four through with two-way center turn lane) from Hana Highway to Hukilike Street.	$3.8 [b]
C5	Road F*	In Kihei, from S. Kihei Road to Piilani Highway	New four lane connector road	$3.5 [b]
C1	Lower Main Street*	In Wailuku, from Kahului Beach Road/Waiehu Beach Road to Hala Place	Widen from two to four lanes with separate left-turn lanes at major intersections	$2.7m
S13a	Kuihelani Highway	In Central Maui, from Puunene Avenue southerly for 1.4 miles (point where Puunene Bypass will intersect)	Widen from two to four lanes	$4.8m
S5	Kuihelani Highway*	In Kahului, from Puunene Avenue to Kahului Airport	New four lane access road to Kahului Airport to provide bypass to Dairy Road	$50.0m
S20a	Puunene Avenue	In Kahului, from Kaahumanu Avenue to Wakea Avenue	Widen from two to four lanes	$1.8 [b]
S20c	Puunene Avenue	In Kahului, from Kuihelani Highway to Mokulele Highway	Widen from two to four lanes	$2.1 [b]
S21a	Hana Highway	In Kahului, from Kaahumanu Avenue to Dairy Road	Widen from four to six lanes from Kaahumanu Avenue to Dairy Road	$2.9m
S14a	Mokulele Highway	In Central Maui, from Puunene Avenue southerly for 1.2 miles (point where Puunene Bypass will intersect)	Widen from two to four lanes	$4.3m
S19a	Honoapiilani Highway	In Central and West Maui, from Kuihelani Highway to N. Kihei Road	Widen from two to four lanes	$10.4m
C3	Road C	In Kihei, from Kihei Road (at Longs/Azeka commercial area) to Piilani Highway	New four lane connector road	$6.1 [b]
S15	Haleakala Highway	In Upcountry area, from Hana Highway to Haliimaile Road	Widen from three to four lanes	$19.1m
	Assessment Studies	Islandwide	Conduct assessment studies for the Paia Alternative Roadway, Hana Highway Widening, Kuihelani Highway Widening, Mokulele Highway Widening, and Honoapiilani Highway Widening	$2.2m

Notes: * Denotes Baseline project.
a. All cost estimates are in millions of 1995 dollars and include design and construction.
b. Cost to be the full or partial responsibility of private developers.

TABLE 2
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 2001-2005

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 2001-2005				
S3a	Lahaina Bypass*	In Lahaina, from southern terminus to Dickenson Street	Two-lane roadway with access to Honoapiilani Highway at Dickenson Street.	$17.0m
C2	Waiale Road Extension*	In Wailuku, from Waiale Road through Maui Community Corrections Center to Honoapiilani Highway	Two lane roadway to provide access between Waiale Road and Honoapiilani Highway	$3.0 [b]
C6	North/South Collector Road	In Kihei, from Uwapo Road to Road F	New two lane collector road in north south direction	$23.1 [b]
S23	Mokulele/Piilani Highway Intersection	In Kihei, at intersection of Mokulele and Piilani Highways	Reconfigure intersection making the Mokulele to Piilani move the through movement	$10.8m
C4	S. Kihei Road	In Kihei, from Longs to Lipoa Street	Widen roadway from two to four lanes with continuous left turn lane	$0.9m
C13	S. Kihei Road	In Kihei, from Kupuna Street to Welakahao Road	Widen roadway from two to four lanes	$0.9m
S14b	Mokulele Highway	In Central Maui, from a point 1.2 miles south of Puunene Avenue to N. Kihei Road	Widen from two to four lanes	$17.3m
S18	Paia Alternative Roadway	In Paia, from Spreckelsville to Hookipa Park	New two lane roadway to bypass town of Paia	$17.5m
C7	Lower Main Street	In Kahului, from Waena Street to Mill Street	Widen from two to four lanes and provide separate left-turn lanes at major intersections	$1.8m

Note: * Denotes Baseline project.
a. All cost estimates are in millions of 1995 dollars and include design and construction.
b. Cost to be the full or partial responsibility of private developers.

TABLE 3
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 2006-2020

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 2006-2020				
S13b	Kuihelani Highway	In Central Maui, from a point 1.4 miles south of Puunene Avenue to Honoapiilani Highway	Widen from two to four lanes	$14.6m
S3b	Lahaina Bypass*	In Lahaina/Kaanapali, from Dickenson Street to northern terminus	Two-lane roadway with access to Honoapiilani Highway at Kapunakea Street, Lealii Parkway, Wahikuli Connector, Kaanapali Connector, and Puukolii Connector	$52.0m
S12	Lahaina Bypass	In Lahaina/Kaanapali, from Kaanapali to Dickenson Street	Widen from two to four lanes	$11.0m
C8a	Maui Lani Parkway	In Wailuku, from Kaahumanu Avenue to Kuihelani Highway	New two lane road	$21.1 [b]
C8b	Oneehee Avenue Extension	In Wailuku, from southern terminus to Maui Lani Parkway	Extension of two lane road	$5.1 [b]
C8c	Kamehameha Avenue Extension	In Wailuku, from southern terminus to Maui Lani Parkway	Extension of two lane road	$4.1 [b]
C8d	Lono Avenue Extension	In Wailuku, from southern terminus to Kuihelani Highway	Extension of two lane road	$2.0 [b]
C8e	Mahalani Street Extension	In Wailuku, from southern terminus to Waiale Road	Extension of two lane road	$8.3m
S20b	Puunene Avenue	In Kahului, from Wakea Avenue to Kuihelani Highway	Widen from two to four lanes	$2.4 [b]
C12	Puunene Bypass	In Wailuku, from Mokulele Highway to Kuihelani Highway	Two lane Puunene Bypass road that connects to Maui Lani Parkway	$11.5 [b]
S21b	Hana Highway	In Kahului, from Dairy Road to Baldwin Avenue	Widen from four to six lanes from Dairy Road to Haleakala Highway, and from two to four lanes from Haleakala Highway to Baldwin Avenue	$21.6m
S6	Piilani Highway	In Kihei, from Mokulele Highway to Wailea	Widen from two to four lanes	$21.6m
S17	Upcountry-Kihei Alternative Roadway	In Upcountry, from Haleakala Highway to Piilani Highway	New two lane roadway to serve as bypass of Mokulele Highway	$57.5m
C10	Papa Avenue	In Wailuku, from Kaahumanu Avenue to Kahului Beach Road	Four lane extension of Papa Avenue	$5.1m
S19d	Honoapiilani Highway	In West Maui, 4 miles west of Maalaea Harbor to Lahaina Bypass	Widen from two to four lanes	$87.2m

TABLE 3 (Continued)
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 2006-2020

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 2006-2020 (Continued)				
C11	Waiale Drive [C Brewers]	In Wailuku, from Kaahumanu Avenue to Honoapiilani Highway	Extend Waiale Drive as a four lane roadway from its curve to Honoapiilani Highway; widen Waiale Drive from Kaahumanu Avenue underpass to Spreckels Ditch; extend Waiale Road to Maui Tropical Plantation as two lane bypass road of Waikapu Village	$18.6 [b]
C9	Imi Kala Street [C Brewers]	In Wailuku, from Kahekili Highway to L. Main Street	Extend Imi Kala Street from Millyard Subdivision to Kahekili Highway as four lane roadway with a four lane bridge over Iao Stream, extend Piihana Road from Imi Kala Street extension to Market Street, extend Imi Kala Street as two lane roadway from Mill Street to L. Main Street and from Millyard Subdivision into Piihana Project District	$6.4 [b]
S10	Kahekili Highway	In Wailuku, from Waiehu Beach Road to Waihee Valley Road	Widen from two to four lanes	$8.3m
S16	Pukalani Bypass	In Pukalani, from Haliimaile Road to Kula Highway	Widen from three to four lanes	$5.1m
S22	Kula Highway	In Kula, from Pulehu to Kula Junction	Widen from two to four lanes	$13.0m
S11	Waiehu Beach Road	In Wailuku, from Kahului Beach Road to Kahekili Highway	Widen from two to four lanes	$5.4m

Notes: * Denotes Baseline project.
a. All cost estimates are in millions of 1995 dollars and include design and construction.
b. Cost to be the full or partial responsibility of private developers.

TABLE 4
KIHEI TRAFFIC MASTER PLAN
YEAR 2005 IMPROVEMENTS

Map #	Improvement
1.	Mokulele Highway/Piilani Highway Intersection - Reconfigure intersection to create Mokulele to Piilani as through movement.
2.	Piilani Highway - Widen to Four lanes from reconfigured Mokulele Highway intersection to Uwapo Road. Also, widen to four lanes at signalized intersections.
3.	North/South Collector - Construct new two lane north/south collector between Uwapo Road and Kanani Road and between Road "F" and Kilohana Drive. Between Waipulani Road and Lipoa Street four lane may need to be provided. Existing streets (i.e., Kenolio Road and collector road south of Welakahao Road) would be incorporated as part of the North/South Collector.
4.	South Kihei Road - Widen to five lanes between Longs and Lipoa Street. This improvement would result in four travel lanes with a continuous left-turn lane.
5.	Road "C" - Construct new four lane road between South Kihei Road and Piilani Highway. This road would provide access to the Longs/Azeka commercial area.
6.	Road "A" - Construct new two lane road between Road "B" and Lipoa Street which provides access to commercial area.
7.	Road "B" - Construct new two lane road between South Kihei Road and North/South Collector which provides access to abutting properties.
8.	Road "F" - Construct new two lane road between South Kihei Road and Piilani Highway.
	Provide traffic signals along South Kihei Road at: • Uwapo Road • Ohukai Road • Kaonoulu Street • Kulanihakoi Road • Road "C" - with this new signal, the existing signals at the McDonald's and Azeka Place driveways could be removed. • Welakahao Road • Kanani Road • Road "F" • Keonekai Road Provide traffic signal at Piilani Highway and North Kihei Road
	Provide traffic signals along Piilani Highway at: • Kaonoulu Street • Waipuilani Road • Welakahao Road • Road "F" • Kilohana Drive
	At all non-signalized locations along Piilani Highway allow right-turn in/out only.

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui shall take into consideration 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 providing for the efficient movement of people and goods.

Joint State/County Maui Interim Transportation Plan, HDOT, January 2002

Purpose and Content

The Maui Interim Transportation Plan (Maui ITP) is a joint effort between the County of Maui and HDOT in consultation with an Ad Hoc Citizens Advisory Committee. The purpose of the plan is to develop interim solutions to relieve traffic congestion on the island of Maui until long-term solutions can be implemented. The plan also attempts to consolidate multiple efforts, including those of the West Maui Traffic Action Committee and the Mayor's Transportation Action Committee, to develop alternative solutions to mitigate traffic congestion.

The Maui ITP was developed under the auspices of the Countywide Transportation Planning Process-Maui to involve the appropriate parties and secure their commitment and support of the recommendations.

Findings Related to the Plan

The focus of the Maui ITP was to address congestion on specific corridors. Recommendations included:

East Maui/Upcountry

- Expedite the Paia Bypass.
- Perform a Paia Town study.
- Phase the Haleakala Highway four-lane divided highway project, with the first phase encompassing the Hana Highway/Haleakala Highway intersection.

West Maui

- Investigate use of Cane Haul Road as an interim roadway (in conjunction with Keawe Street).
- Construct first phase of the Lahaina Bypass between Kapunakea Street and Lahainaluna Road and the connector road from Honoapiilani Highway to Lahaina Bypass.
- Initiate a project to widen Honoapiilani Highway to a four-lane facility between Dickenson Street to approximately 1,000 feet south of Front Street.

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui shall take into consideration recommendations made by the Maui ITP. These recommendations, however, will be taken into consideration as intended, as interim solutions to supplement the long-range priorities. The travel demand model, land use, and stakeholder input will address appropriateness of the recommendations.

Alignment with the Planning Factors

The project recommendations focused on interim solutions to address congestion within major corridors on Maui. The focus is most closely aligned to the Mobility planning factor.

Maui County Short-Range Transit Plan, County of Maui DOT, January 2005

Purpose and Content

The *Maui County Short-Range Transit Plan* provides details on how to implement public transit, and what steps might be taken to do so. It includes guidelines on developing a marketing program to 'brand' Maui transit and lays out a potential short-term (5-year) implementation plan for transit and paratransit services. It also includes a financial plan that identifies funding sources for and capital costs of operating a transit program. The purpose of this plan is to provide additional, specific information on operating public transit in Maui to complement the *Public Transportation Plan for the Island of Maui* (2003).

Findings Related to the Plan

Goals of the Short-Range Transit Plan include:

- Provide a transit system that effectively meets community needs and improves the quality of life.
- Operate and manage the transit system efficiently.
- Provide accessible transit services (multimodal linkages).

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui will be developed in alignment with the transit goals outlined in the *Maui County Short-Range Transit Plan*, and will be consistent with the overall vision of the Maui DOT for public transit.

Alignment with the Planning Factors

The plan focuses on providing Modal Integration while enhancing the Economic Vitality of the island and Mobility for residents and visitors.

Maui County Multi-Hazard Mitigation Plan, County of Maui, Civil Defense Agency, January 2010

Purpose and Content

The purpose of the *Maui County Hazard Mitigation Plan* is to reduce or minimize human and property loss, economic disruption, ecosystem degradation and cultural or historical destruction from a natural disaster. The plan also provides a basis for coordination of state and county hazard mitigation programs, and encourages coordination between agencies responsible for implementing hazard mitigation through building standards and local land use development decisions and practices.

This multi-hazard mitigation plan focuses on assessing risk of certain types of natural hazards in the county, 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 *Maui County Hazard Mitigation Plan* that are applicable to the long-range transportation plan include the following:

- Reduce property damages caused by natural disasters.
- Reduce economic losses and minimize disruption to local businesses.
- Protect the ongoing operations of critical facilities.

Mitigation strategies 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 Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui will be developed with consideration given to the above strategies.

Alignment with the Planning Factors

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

Molokai Long-Range Land Transportation Plan, HDOT, February 1997

Purpose and Content

The purpose of the *Molokai Long-Range Land Transportation Plan* is to provide a transportation improvement plan through the Year 2020. The plan identifies issues and needs for land transportation facilities on the island, based upon socio-economic and land use forecasts for Molokai.

Moderate growth is expected on Molokai. The plan enforces a growth strategy for the island by designating areas appropriate for future urbanization and revitalization through highway facility development. The plan also summarizes existing and future forecasted transportation conditions, identifies deficiencies on highway facilities, and documents conclusions and recommendations for improvement projects or actions to address growth. Environmental, political, social, and economic issues which may need to be addressed as part of project or program implementation are identified. These projects will be incorporated into the overall planning and budgeting process for the HDOT and the County of Maui Department of Public Works.

The Molokai Long-Range Land Transportation Plan was developed under the guidance of three committees: the Policy Committee, the Technical Advisory Committee, and the Citizens Advisory Committee. The general public also was invited to attend and participate in scheduled Ad Hoc Citizens Advisory Committee meetings.

Findings Related to the Plan

The goal of the *Molokai Long-Range Land Transportation Plan* is to implement a land transportation system that will not only provide safe and efficient movement of people, goods, and services through the Year 2020 but take into account public sentiment and the unique character of Molokai.

In the Year 2020, highway deficiencies are expected due to existing substandard roadway cross-sections and drainage issues. Major intersection movements are also expected to incur high delay times. The plan includes recommendations for specific future highway improvements, and stresses maintenance and improvement of the existing roadway system using community policies and guidelines. These recommendations, in priority order, are:

- Improve the existing drainage crossing Maunaloa Highway at Kaunakakai Stream, west of Kaunakakai Town, to an all-weather highway crossing by upgrading the drainage culverts under the highway or by constructing a bridge over the stream.
- Improve Kamehameha V Highway in East Molokai to a minimum 10 foot-wide lanes.
- Construct a modern roundabout at the intersection of Maunaloa Highway/Kamehameha V Highway and Ala Malama Avenue/Kaunakakai Place.
- Construct an all-weather highway crossing at the existing ford on Kamehameha V Highway at Kamalo 10.8 miles east of Kaunakakai Town.

- Construct an all-weather highway crossing at the existing ford on Kamehameha V Highway at Ualapue 13.2 miles east of Kaunakakai Town.
- Construct an all-weather highway crossing at the existing ford on Kamehameha V Highway at Pukoo 16.0 miles east of Kaunakakai Town.
- Widen Maunaloa Highway at Kalae Highway to provide an exclusive left turn lane and a median left turn merge lane to facilitate the left turn movements to and from Kalae Highway.
- Widen Maunaloa Highway, between Kalae Highway and Ala Malama Avenue to include 12 foot-wide lanes in both directions and 6 foot-wide paved shoulders on both sides of the highway.

Alignment with the Planning Factors

The focus on highway facility improvement in the *Molokai Long-Range Land Transportation Plan* aligns with several of the planning factors: System Preservation, System Efficiency Management and Operations, Economic Vitality, and Safety. The emphasis on community values supports the Environment and Sustainability, and Transportation Access Mobility planning factors.

Kahului Commercial Harbor 2030 Master Plan and Draft Environmental Impact Statement, HDOT Harbors Division, December 2007

Purpose and Content

This master plan is an update to the *Kahului Commercial Harbor 2025 Master Plan*. The 2025 Master Plan was a long-range guide to developing, maintaining, and enhancing Kahului Harbor on the Island of Maui. It provided recommendations on harbor improvements through 2025 that were mainly focused on accommodating overall long-term growth in cargo and commercial operations.

The *Kahului Commercial Harbor 2030 Master Plan* includes short- and long-term improvements through 2030. It specifically focuses on improvements to cargo (prioritizing cargo operations over other commercial operations) and recommendations that produce near-term results (in addition to long-term benefits). The 2030 Master Plan includes an EIS that evaluates the recommended improvements in terms of potential impact to areas such as air quality, traffic, public services, and infrastructure, and cultural, historic, visual, aesthetic, and recreational resources.

Findings Related to the Plan

Primary objectives of the commercial harbor master plan include:

- Provide space and facilities to meet current and anticipated future demand associated with movement of cargo to and from Maui, while encouraging efficient, space-saving operations.
- Implement in the near future steps to decrease congestion within the harbor.
- Make space for operations of an inter-island ferry and cruise ships within the harbor. Cruise ships would be limited to no more than one dedicated berth at Kahului Commercial Harbor, but use of other berths for cruise ships would be possible, based on availability.
- Continue to respect recreational uses in the Kahului Commercial Harbor area.

Secondary objectives of the master plan include:

- Where possible, separate cargo and passenger operations for reasons of safety, efficiency, and visitor satisfaction with Maui.
- Develop facilities that can accommodate multiple uses in the event that vessels and demand change in the years to come.

Recommended improvements, additions, or modifications to the harbor are documented in the master plan, and are based on the knowledge and experience of harbor users and their anticipated future needs. Two development alternatives and one no-action alternative are described.

Alternative A includes development of cruise and inter-island ferry facilities at the West Breakwater Harbor Development. It also recommends expansion of Piers 1 and 2 for cargo operations and a new fuel facility at Pier 3 or 4.

Alternative B includes development of cruise and inter-island ferry facilities at Pier 2 and expanded cargo facilities at Piers 1 and 3 and at the West Breakwater Harbor Development.

No Action Alternative assumes no expansion of existing facilities, except for projects already planned and approved under the 2025 Master Plan Final Environmental Assessment.

Although the 2030 Master Plan does not recommend improvements at specific roadway locations or intersections, local community plans such as the Wailuku-Kahului Community Plan do offer guidance on specific future roadway improvements, and were considered when developing the alternatives for the EIS. Operations on the connection or interface roads between harbor facilities and the highway network should also be maintained.

Coordination with the Statewide Transportation Planning Office, the Highways Division, and the Harbors Division will occur when developing planned improvements. The statewide and regional long-range transportation plans will take into account the roadway needs for Kahului Harbor to support maritime growth.

Alignment with the Planning Factors

The master harbor plan supports Economic Vitality by prioritizing the efficient transport of cargo and goods. The master plan also supports System Preservation by addressing potential impacts due to long term harbor growth and future congestion through comprehensive planning of proposed harbor improvements.

Kahului Airport Master Plan, HDOT Airports Division, June 1993

Purpose and Content

The *Kahului Airport Master Plan* is part of an ongoing planning process for the airport. It builds upon previous airport master plans and development plans. Its objective is to update guidelines for future airport development that will satisfy forecast aviation demand in a financially sound 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 1993 with a planning horizon of 2010.

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

- A graphic presentation of future airport development within the context of current and anticipated land uses in the airport vicinity.
- A prioritized capital improvement program and schedule for developments proposed in the plan.
- The technical rationale and documentation of procedures used to formulate and assess alternatives in determining the proposed facilities and land use plan.
- Reaffirmation of the ongoing 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 passengers and cargo demand at the Kahului Airport is shown below.

	1989 Actual	**2010 Forecast**
Passengers	4,745,515	9,059,000
Cargo	38,409	64,000
Aircraft Operations	177,803	306,000
Based Aircraft	48	75

The airport master plan is consistent with the Maui General Plan transportation objectives and policies to "Support an advanced and environmentally sensitive transportation system which will enable people and goods to move safely, efficiently, and economically."

To accommodate the projected demands, recommended improvements through the year 2010 are grouped into three phases.

Phase I projects are to be initiated by 1996. Phase I contains improvements related to airfield extension, cargo terminal relocation, a new aircraft rescue and firefighting station, internal access road improvements and a new interchange and access road from Hana Highway. Land acquisition is also incorporated into Phase I. The new access will relieve congestion at

the Dairy Road intersection, by connecting directly to the terminal loop road. ($133.67 million)

Phase II projects are to be initiated by 2002. The Phase II improvements focus on commercial/cargo facilities, and improvements to fuel storage. Ground transportation facilities in the runway protection zone will be expanded during Phase II. Additional land acquisition would occur for a parallel runway and realignment of Hana Highway. An emergency route will be constructed linking Alahao Street with Old Stable Road. The route will support bicycle and pedestrian traffic, facilitating development of a shoreline trail and will only be open to vehicles during an emergency. The Kanaha Beach Park will also be expanded during this phase of work, increasing regional recreational activity space. ($39.76 million)

Phase III projects are to be initiated by 2010. Phase III improvements include construction of a parallel runway, apron parking, internal access road improvements, and access improvements to/realignment of Hana Highway ($149.17 million).

Alignment with the Planning Factors

Kahului Airport improvements in general 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 and planning factors, and are mainly focused on vehicular access. Mobility, for pedestrians and bicyclists, as well as overall Safety and Security, are also addressed by the construction of the emergency roadway between Alahao Street and Old Stable Road. System Preservation is addressed by providing relief to the current congested Dairy Road access to the airport facilities.

Kapalua Airport, HDOT Airports Division

Purpose and Content

No master plan is currently available.

The Kapalua Airport is in West Maui and is served by commercial propeller air carriers and commuter/air taxi aircraft only. This facility started as a private facility until its acquisition by the State of Hawaii in 1993.

The facility consists of a single runway, terminal facilities, and support facilities. There are no air cargo facilities at this airport. Access to this airport is provided from a two-lane road off of Honoapiilani Highway. Improvements to this airport are limited to certain upgrades only. The runway, apron, and other facilities cannot be expanded without changes to the existing agreement with the County of Maui. Operations are limited to daytime hours only.

The airport is managed by the Maui Airport District, headquartered at Kahului Airport.

Findings Related to the Plan

Not applicable.

Alignment with Planning Factors

Not applicable.

Hana Airport Master Plan, HDOT Airports Division, October 1998

Purpose and Content

The purpose of the Hana Airport Master Plan is to establish a direction for future growth and development through realization of an extensive series of goals organized around five major issue areas. These issue areas and their goals are summarized below:

Overall Airport Role and Development

- Determine a long-range vision for airport development.
- Choose the best uses for airport property.
- Develop, maintain, and operate the airport to maximize safety and convenience to the traveling public.
- Provide for airport-related development to balance community needs with acceptable economic returns.
- Define general aviation and commercial activity and develop consistent with projected demand.
- Develop and maintain community support for airport development.
- Maintain and design Hana Airport as a general aviation and commercial service airport, and develop and market the airport as a charming gateway, with the goal of fully realizing the community's cultural significance.

Airfield and Airspace

- Develop and operate the airport to safely and efficiently meet forecast aviation demand.
- Minimize aircraft delay.
- Maximize airfield and airspace capacity.
- Develop regional cooperation between Federal Aviation Administration and regional airports for safe productive use of the airspace resource.

Terminal Area Development

- Provide passenger terminal facilities that are flexible, expandable, adaptable, efficient, and balanced.
- Maximize public convenience and minimize passenger congestion.
- Maximize the passenger processing capability of the terminal facilities.

Economic Development

- Achieve a balance between economic benefits and environmental protection.
- Develop and operate the airport to be consistent with the Hana Community Plan.

Environmental Protection

- Protect and enhance the environment on and around the airport consistent with airport operation.
- Minimize noise impacts.
- Protect the airport by retaining and enhancing land use compatibility of land around it.
- Design, construct, operate, and maintain airport facilities to minimize impacts on the natural environment.

This master plan was adopted in 1998 with a planning horizon of 2017.

Findings Related to the Plan

The master plan recommends a phased development plan and capital improvement program with Phase I improvements (2002) being focused on improved accessibility by aircraft and improved terminal area facilities. Phase II (2007) is focused on maintaining existing airside and landside paved areas and Phase III (2017) is focused on reconstruction and maintenance of paved airside and landside surfaces. The cost of the 20-year development plan is estimated to be $10,875,000 (in 1998 dollars).

Alignment with the Planning Factors

Hana Airport improvements in general are proposed to accommodate future demands and maintain existing air and landside facilities.

Improvements related to ground transportation access and ground transportation facilities acknowledge the Accessibility and Mobility planning factors, and are mainly focused on vehicular facility Preservation and additional parking demands.

Lanai Airport Master Plan Update, HDOT Airports Division, June 1999

Purpose and Content

The objectives of the *Lanai Airport Master Plan Update* are to reevaluate, monitor key conditions, and adjust the 1990 Master Plan recommendations if required by changed circumstances. The Master Plan Update will also assist in providing guidelines for future airport development make recommendations which will ensure viability of the airport in a financially sound manner, and address the Lanai Community's environmental and socioeconomic issues and concerns through the year 2020. This master plan was adopted in 1999 with a planning horizon of 2020.

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

- A graphic presentation of future airport development within the context of current and anticipated land uses in the airport vicinity.
- A prioritized capital improvement program and schedule for developments proposed in the plan.
- The technical rationale and documentation of procedures used to formulate and assess alternatives in determining the proposed facilities and land use plan.
- Reaffirmation of the ongoing 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

The master plan recommends a phased development plan and capital improvement program with Phase I improvements (2010) focused on improving the airfield; new and overlay runways, taxiways, apron space and navigational aids. Associated utility infrastructure improvements and an internal perimeter road are also programmed for Phase I. Total Phase I costs are $19.987 million. Phase II (2020) is focused on completing the Phase I airfield and navigational improvements as well as expanding the terminal building and parking areas. Total Phase II costs are $3.367 million. Phase III (>2020) denotes areas to reserve for airport support, fuel storage, helicopters, general aviation needs and ground transportation. No costs were provided for Phase III.

Alignment with the Planning Factors

Lanai Airport improvements in general are proposed to accommodate future demands and maintain existing air and landside facilities.

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

Molokai Airport Master Plan, HDOT Airports Division, May 1999

Purpose and Content:

The purpose of the *Molokai Airport Master Plan* is to determine and document the type and extent of aviation facilities needed at Molokai Airport through the year 2020 and to prepare a master plan that satisfies the projected demand. Major elements of the master plan study include an inventory of existing conditions at the Airport and its environs; forecasts of future aviation activity; a determination of future aviation and nonaviation facility requirements; development of a master plan for airport improvements; and development of an implementation plan. This master plan was adopted in 1999 with a planning horizon of 2020.

Findings Related to the Plan

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

	1992 Actual	2020 Forecast
Passengers	314,489	497,00
Cargo	1,159	4,600
Aircraft Operations	35,662	39,800
Based Aircraft	3	5

To accommodate the projected demands, recommended improvements through the year 2020 are separated into two phases. Estimated project costs are shown in 1998 dollars.

Phase I projects are to be initiated by 2005. Phase I focuses on preparation for runway extension including land acquisition, grading, drainage improvements. The intersection of Keonelele and Mokulele Avenues is proposed to be depressed (lowered) as part of this phase. ($7.18 million).

Phase II projects are to be initiated by 2020. The Phase II improvements include extending and improving the airfield runway and taxiway. A new terminal building, parking and terminal roadways would be constructed on-site. Off-site transportation improvements include upgrading portions of Hauakea Avenue and Pine Avenue, adding left-turn lanes and constructing Maunaloa Highway tunnel. ($59.47 million)

Alignment with the Planning Factors

Molokai Airport improvements in general address the Economic Vitality of the state by upgrading and 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. The master plan provides recommended improvements for both on-site circulation/access as well as offsite improvements to the highway system.

Kalaupapa Airport Master Plan, HDOT Airports Division, May 1990

Purpose and Content

The purpose of the *Kalaupapa Airport Master Plan* is to provide a comprehensive plan for the development of Kalaupapa Airport for 20 years to the year 2008. The development program is constrained by the location of the airport in a Historical Park and Landmark, the dependence on barge transportation for importation of equipment and materials, and the complex land ownership situation involving Hawaiian Home Lands and state, federal, and private land ownership. The master plan addresses eight key issues of development within a complex framework of constraints. These eight issues include the Runway, Apron and Taxiway, Emergency Medical Evacuation at Night, Security of the Aircraft Operating Area, Passenger Terminal Facilities, Airport Support Facilities, Airport Access Road, and Land for Airport Use. This master plan was adopted in 1990 with a planning horizon of 2008.

Findings Related to the Plan

Within the *Kalaupapa Airport Master Plan*, the Priority Action Program states that "the only improvements planned for Kalaupapa within the twenty year horizon of this Master Plan will be made in the 1991 – 1992 time frame." Improvements include runway, taxiway, and apron improvements, access road improvements, and airfield lighting.

Alignment with the Planning Factors

The Kalaupapa Master Plan focuses mainly on bringing the airport facilities into compliance with Safety and other Federal Aviation Administration requirements. Safety is also improved with provision of runway lighting that allows nighttime medical emergency and air rescue operations to occur. Additionally, with these improvements, Economic Vitality of the community can be increased by allowing more aircraft access (visitors) to the town.

Proposed Roadway Development Program, County of Maui Planning Department, January 2007

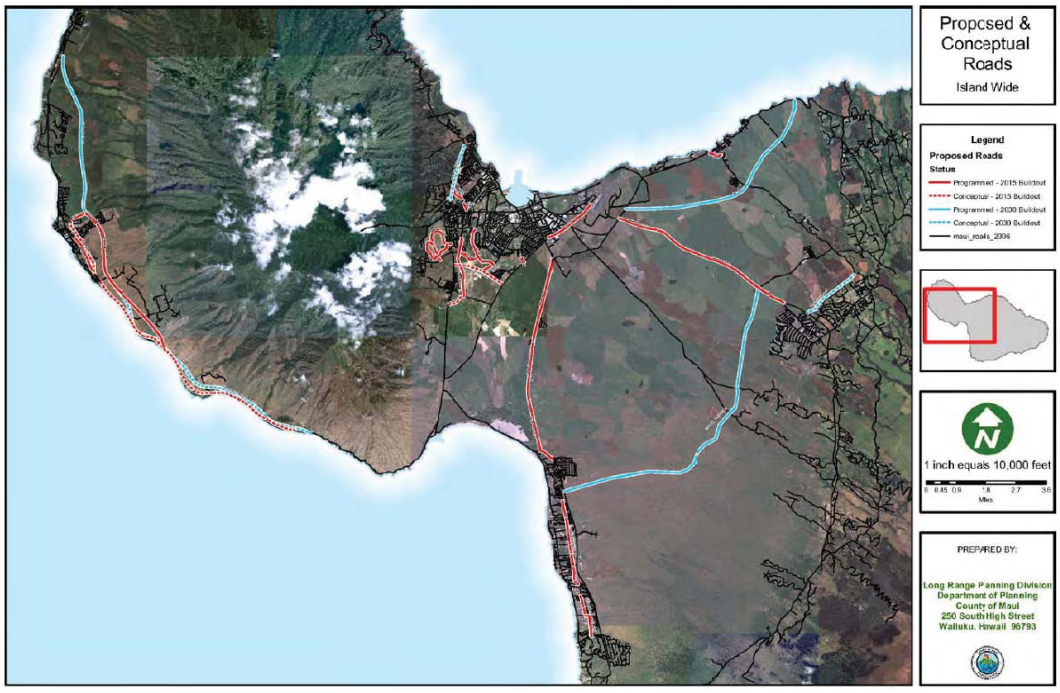
Purpose and Content

This Program provides a summary of existing land use, socioeconomic conditions (population gathered from 2000 Census), demographic information, and visitor activity for the Island of Maui. An assessment of existing roadway conditions is provided, and anticipated future roadway conditions in the forecast year with projected land use and development trends is also presented. The purpose of this study is to assess future roadway conditions and identify whether planned future roadway improvements will be effective in accommodating forecast traffic.

Findings Related to the Plan

Traffic conditions at 31 spot locations on Maui Island were analyzed. Each location was analyzed by direction for both the a.m. peak hour and p.m. peak hour for a total of 124 unique levels of service (LOS) results.

Under existing conditions, 11 locations operate at LOS E or F during the a.m. peak, while 16 locations operate at LOS E or F during the p.m. peak hour. In the 2030 No Build Alternative, assuming the same roadway network as in 2004, 37 locations in the a.m. and 40 locations in the p.m. are expected to operate at LOS E or F. To address capacity deficiencies, a range of alternative improvements was developed with the goal of achieving LOS D traffic conditions throughout the island. A map and list of improvements considered by the County of Maui is shown below on figures and tables excerpted from the Program.



Source: County of Maui Department of Planning

FEHR & PEERS
KAKU ASSOCIATES

FIGURE 8
PROPOSED IMPROVEMENT PROGRAM

PROPOSED HIGHWAY IMPROVEMENT PROJECT LIST

Project Number	Project Description
1	Haleakala Widening 2 (Firebreak Road to Haliimaile)
2	Up-Country - Kihei Corridor
3	Honoapiilani Realignment - aka Lahaina By-Pass
Phase A	Keawe St. to Lahainaluna Road
Phase B	Lahainaluna Road to Launiupoko
Phase C	Keawe St. to Honokowai
4	Pali to Puamana realignment aka Honoapiilani Realignment
5	Keawe St. Extension
6	Mill Street Extension (Aholo St to Keawe)
7	Paia By-Pass
8	Mokulele Widening
9	Kihei North-South Collector Road
10	Waiale Extension
11	Kahului Airport
12	Honoapiilani widening Aholo St to Lahainaluna
13	Waiale/Kuihelani Hwy Connector
14	Lono Ave extension to Kuihelani Hwy
15	Imi Kala/Piihana extension (bridge)
16	Imi Kala/Waiale -Mill St, extension
17	Paniolo Connector (Haleakala Hwy - Baldwin Ave)
18	Kehekili Hwy widening
19	Maui Lani Parkway
20	Kuikahi Drive Extension
21	Kehalani Collector Road
22	Kehalani Loop Road

With 2030 forecasted growth and with the range of roadway improvement projects implemented, traffic operations would improve compared to the No Build condition. With improvements, just 29 locations in the a.m. and 33 locations in the p.m. peak hour are expected to operate at LOS E or F.

Alignment with the Planning Factors

The Proposed Roadway Development Program focused on addressing traffic congestion and improving mobility on the Island of Maui. This aligns with the System Efficiency Management and Operations and System Preservation planning factors.

Resolution No. 12-34: A Resolution Establishing a Complete Streets Policy for the County of Maui, Council of the County of Maui, Adopted April 10, 2012

Purpose and Content

The Council of the County of Maui adopted a Complete Street Policy to:

- Promote safe access for pedestrians, bicyclists, motorists, and public transportation users of all ages and abilities.
- Support and encourage multiple travel modes and include safe and ample space for pedestrians, bicyclists, and public transportation.
- Integrate all travel modes in the design of streets and highways, especially in and around town cores.
- Promote public transit and non-motorized travel as alternatives to single-passenger automobile travel.
- Encourage healthy lifestyles.
- Develop a connected and complete transportation network that reduces hazards and improves safety for pedestrians and cyclists, especially vulnerable populations who may be unable to operate a motor vehicle.

The resolution was developed in response to ACT 54, a 2009 Legislative Act that required counties to adopt a Complete Streets policy. The resolution was also developed to align with national engineering, planning and health organizations, numerous transportation agencies throughout the United States and the Countywide Policy Plan.

Findings Related to the Plan

The resolution states that all roadway projects be balanced and equitable in accommodating all modes of travel including non-motorized users of all ages and abilities in accordance with Complete Streets principles.

The resolution is consistent with the direction of the Countywide Policy Plan which prioritizes safe, complete connections for pedestrians and bicyclists between and within communities, and requires developments to be designed with pedestrians in mind.

Alignment with the Planning Factors

The Complete Streets policy addresses many of the planning factors including increasing Safety, Accessibility, and Mobility for all modes of travel with proper planning and design for all modes. The Environment and Sustainability of the county will also be enhanced because various modes of travel are encouraged.

Final Environmental Impact Statement Honoapiilani Highway (FAP Route 30) Puamana to Honokowai, Maui County, 1990

Purpose and Content

This FEIS was completed in 1990, and assessed existing (1987) and future (2007) forecasted traffic conditions through the Lahaina area between Puamana and Honokowai along Honoapiilani Highway. The study concluded that traffic demand would exceed the capacity of the highway in 2007; therefore, various corridor alternatives to improve congestion and address anticipated future traffic deficiencies were developed and evaluated.

Findings Related to the Plan

The preferred alternative included a new roadway, mauka of the existing Honoapiilani Highway, in land that was designated for agricultural use. (Land use boundary changes would be necessary to implement the preferred alternative.) This new road would consist of two-lane and four-lane sections, and would connect Puamana to Honokowai by allowing trips to bypass Lahaina.

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui shall take into consideration the preferred alternative, and will compare it against current traffic conditions and current long-range priorities.

Alignment with the Planning Factors

The FEIS focused mainly on addressing traffic congestion and improving mobility in the Lahaina area. This aligns with the System Efficiency Management and Operations, System Preservation, and Economic Vitality planning factors.

Kihei Traffic Master Plan, County of Maui Department of Public Works and County of Maui Planning Department, October 1996

Purpose and Content

The purpose of the Kihei Traffic Master Plan was to build upon the work conducted for the *Maui Long-Range Land Transportation Plan* (1997) and focus on localized traffic issues within the Kihei area. By focusing on local and collector streets rather than the regional and the sub-regional highways, specific short-range traffic improvements could be developed with the intention of implementation in the short term (within 10 years).

The *Kihei Traffic Master Plan* included an assessment of existing (1994) traffic conditions and future (2005) forecasted traffic conditions at 19 intersections along South Kihei Road and along Piilani Highway. Both the morning and the evening peak hours were analyzed.

By 2005, all but one of the study intersections was expected to operate at LOS F in the morning or evening or both peak hours.

Findings Related to the Plan

Long-range improvements identified through work on the *Maui Long-Range Land Transportation Plan* included roadway widening and the construction of new connector roadways within Kihei.

- Reconfigure the intersection of Mokulele Highway/Piilani Highway to make the through movement between Mokulele Highway and Piilani Highway the major movement.
- Widen Piilani Highway to four lanes between Mokulele Highway and Uwapo Road and at signalized intersections for up to 300 feet on each side.
- Construct new two-lane north/south collector between Uwapo Road and Kanani Road and between Road F and Kilohana Drive.
- Widen S. Kihei Road to five lanes between Longs Drugstore and Lipoa Street.
- Construct new four-lane road, Road C, between S. Kihei Road and Piilani Highway, located north of Lipoa Street.
- Construct new two-lane road, Road A, from Road B and Lipoa Street between S. Kihei Road and the new north/south collector.
- Construct new two-lane road, Road B, between S. Kihei Road and the new north/south collector.
- Construct new two-lane road, Road F, between S. Kihei Road and Piilani Highway.

Short-range improvements included signalization of stop-controlled intersections and additional capacity at specific intersections.

- Signalize the following intersections on S. Kihei Road:
  - Uwapo Road

  - Ohukai Road
  - Kaonoulu Street
  - Kulanihakoi Road
  - Road C (remove signal at McDonalds and Azeka Place driveways)
  - Welakahao Road
  - Kanani Road
  - Road F
  - Keonekai Road
  - Piilani Highway
- Signalize the following intersections on Piilani Highway:
  - Kaonoulu Street
  - Waipulani Road
  - Welakahao Road
  - Road F
  - Kilohana Drive
- Control access to/from Piilani Highway. Only allow right-turns in and right-turns out at the following stop-controlled intersections:
  - Kulanihakoi Street
  - Kanani Road
  - Keonekai Road

The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui shall take into consideration the identified improvements, and will compare it against current traffic conditions and current long-range priorities.

Alignment with the Planning Factors

The *Kihei Traffic Master Plan* focused mainly on addressing traffic congestion and improving mobility in the Kihei area. This aligns with the System Efficiency Management and Operations and System Preservation planning factors.

Update of Regional Transportation Modeling for the Island of Maui: Model Methodology and Calibration Report, 2008

Purpose and Content

The report summarizes the socio-economic data, land use data, assumptions, model structure, forecasting methodology, and forecasting processes used to develop the 2001 version of the TransCAD travel demand forecasting model for the island of Maui. The report also describes the validation process to ensure the base model reasonably represented traffic conditions for the year 2001. Forecasted traffic conditions were provided for the year 2030. The Maui travel demand model was used as a tool for long-range transportation planning.

Findings Related to the Plan

The 2001 version of the forecasting model for the island of Maui was updated and refined to reflect 2007 existing traffic conditions for the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui.

A summary of the changes made to the 2001 Maui model include:

- Additional traffic analysis zones on the Island of Maui to increase zone detail in some areas.
- Model structure changes to the scripts within TransCAD to simplify the programming and separate model process steps.
- County assessor data used as the primary data source for households and visitor accommodations.
- Base year 2007 socioeconomic and roadway network data.
- Network look-up tables expanded to include terrain and adjusted link capacities.
- PM peak-hour model was developed for the 2007 models and used instead of the link peaking factor process used in the 2001 Maui model.
- Geographic interface developed to support standard output reports and maps developed within TransCAD.

The refined model was used for planning-level analyses at the collector roadway and higher level, which showed how travel is distributed around the island based on where the socioeconomic and network modifications (such as new or improved roadways) occur. The model assigned trips generated by the model based on what could be expected to occur, given the various model inputs. The travel demand model was developed as a tool to assist in understanding the relationship between the socioeconomic patterns and the roadway network. The model assists in understanding where capacity issues could occur given the network and socioeconomic assumptions. The travel demand model is not able to perform detailed operational analysis, such as adding turn lanes at an intersection.

Alignment with the Planning Factors

Not applicable.

Land Use Forecast, Island of Lanai, Maui County, December 2012

Purpose and Content

The Land Use Forecast for Lanai is a study to support the development of the Lanai Community Plan. It includes a summary of existing urban land uses and an assessment of future urban land use supply and demand. Only urban land uses (residential, resort, commercial, and industrial categories) are analyzed; agricultural and conservation lands are not analyzed in this study.

Findings Related to the Plan

Based on the socioeconomic and land use forecasts, the amount of land available in 2035 would likely to meet the projected demand for resort uses (visitor units), industrial uses, and nonresident housing. The demand for resident housing though would likely exceed the anticipated supply, and new affordable housing or redevelopment in residential areas would be needed to meet demand in 2035. Projected demand for commercial land would also likely exceed the amount of commercial space anticipated in 2035.

Demographics on Maui, Molokai, and Lanai are summarized below for 2010, 2020, and 2035. The Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui shall take into consideration the findings from the Land Use Forecast.

	Maui Island	Lānaʻi	Molokaʻi
2010 Data			
Resident Population	144,444	3,135	7,345
Wage and Salary Jobs	61,240	1,260	1,950
Visitor Units (Total)	19,325	352	392
Average Visitor Census	46,023	673	682
Important Ratios (2010)			
% of Population			
age 0-19	25.0%	27.3%	29.2%
age 20-64	62.4%	57.6%	54.5%
age 65 and up	12.6%	15.1%	16.3%
Unemployment Rate	8.1%	6.5%	12.8%
AVC / Resident Population	31.9%	21.5%	9.3%

	Maui Island	Lāna'i	Moloka'i
2020 Forecast			
Resident Population	169,540	3,463	8,014
Wage and Salary Jobs	73,088	1,587	2,456
Unemployment Rate	6.6%	5.3%	10.4%
Visitor Units (Total)	19,326	352	392
Average Visitor Census	53,834	793	803
2035 Forecast			
Resident Population	206,884	4,020	9,304
Wage and Salary Jobs	82,740	1,935	2,765
Unemployment Rate	5.0%	4.0%	8.0%
Visitor Units (Total)	22,316	352	392
Average Visitor Census	61,934	912	924
Annual Rate of Change, 2010 to 2035			
Resident Population	1.45%	1.00%	0.95%
Wage and Salary Jobs	1.21%	1.73%	1.41%
Visitor Units (Total)	0.58%	0.00%	0.00%
Average Visitor Census	1.19%	1.22%	1.22%

Alignment with the Planning Factors

Not applicable.

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

Purpose and Content

The Maui National Wildlife Refuge Complex consists of the Kakahaia National Wildlife Refuge on the south coast of Molokai and the Kealia Pond National Wildlife Refuge on south central coast of Maui. A multiyear planning process to develop a 15-year comprehensive conservation plan and environmental assessment 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 received comments from the initial round of public outreach.
- Kakahaia Refuge – habitat management, partners and community, staff and visitor services, and climate change.
- Kalia Pond Refuge – Environmental nuisances, research, facility management, land acquisition, and visitor services and outreach.
- All comments will be considered as the plans are developed.

Alignment with Planning Factors

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

County of Maui Budget Fiscal Years 2011, 2012, and 2013; Capital Improvement Program; County of Maui, Fiscal Years 2011, 2012, and 2013

Purpose and Content

The capital budget provides a listing of projects and services for the County of Maui for the fiscal years 2011, 2012, and 2013. 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 somewhat 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**
1.1. Preserve and enhance the natural environment, including biological and aesthetic resources.	• 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.	• 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.
1.2. Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.	• Avoid, minimize, and provide reasonable measures to mitigate degradation of Hawaii's cultural resources environment caused by transportation facilities and operations.	• 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**
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.	• 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.	• Periodically evaluate environmental regulation compliance, evaluate compliance goals, and prioritize improvements needed. • Consult and collaborate with regulatory agencies to implement solutions.
1.4. Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	• 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.	• 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.
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.	• 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.	• 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**
2.1. Provide a Complete Streets transportation system of motorized and non-motorized options.	• 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.	• 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).
2.2. Promote efficient travel between modes by creating connections and removing barriers.	• 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.	• 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**
2.3. Promote safe connections between modal alternatives.	• Provide transportation modal options and connections that address safety considerations of all users, especially at-risk population segments (children, elderly, disabled).	• 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**
3.1. Manage transportation assets and optimize investments.	• Plan and implement maintenance, resurfacing, rehabilitation, and reconstruction to optimize existing transportation system improvements and spending.	• 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**
3.2. Maintain safe, efficient, complete transportation system for the long term.	• Plan and implement existing system improvements to effectively sustain the overall transportation system's safe, efficient, and complete operations.	• 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**
4.1. Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.	• 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.	• 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**
	• Improve flow of information to the traveling public	• 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)
4.2. Improve resiliency of the state through the transportation system.	• 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.	• 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**
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.	• 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).	• 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**
6.1. Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.	• Improve consistency and predictability of travel time along existing corridors. • Preserve the functional classification system hierarchical operating characteristics.	• 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**
7.1. Provide appropriate and reliable transportation access options statewide to all users.	• Provide services and infrastructure to support modal alternatives for all demographics.	• 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.
7.2. Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves environmental justice populations).	• Prioritize projects equitably to serve all modes and demographics, with attention to underserved communities.	• 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). Support paratransit programs that meet the needs of the disabled and elderly population.

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**
8.1. Maintain a safe transportation system for all land transportation modes.	• 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.	• Coordinate with the Strategic Highway Safety Plan to implement plan recommendations and monitor performance, including: – 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**
		• 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.	• Provide emergency access to all parts of the state, especially in locations with only one road in and out.	• 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**
9.1. Obtain sufficient and specific transportation funding.	• 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	• 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).
9.2. Optimize project delivery.	• Improve coordination of plans and resources. • Improve efficiency of planning and delivery of projects.	• 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.
9.3. Provide ongoing planning to assess and address statewide needs.	• Monitor, evaluate and develop solutions, and adjust program goals on a continuing periodic coordinated basis.	• Continue to implement the 3-C planning process (comprehensive, cooperative and continuing).

Additional Goals, Objectives, and Strategies		
Goals	**Objectives**	**Strategies**
9.4. Coordinate use of public right-of-way with other public service providers.	• Continue the safe accommodation and installation of utility facilities within the right-of-way or easement along state highways and federal-aid county highways.	• 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 Maui: 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: Cheryl Yoshida/CH2M HILL
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Neha Rathi/CH2M HILL

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 Maui. 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 islands of Maui, Molokai and Lanai 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.

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.

Existing Roadway System

The roadway system is the backbone for moving both people and goods within the District of Maui. All modes of land transportation use the roadway system.

The existing roadway system within the islands of Maui, Molokai, and Lanai consist of arterial, collector, and local roadways.

- **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.

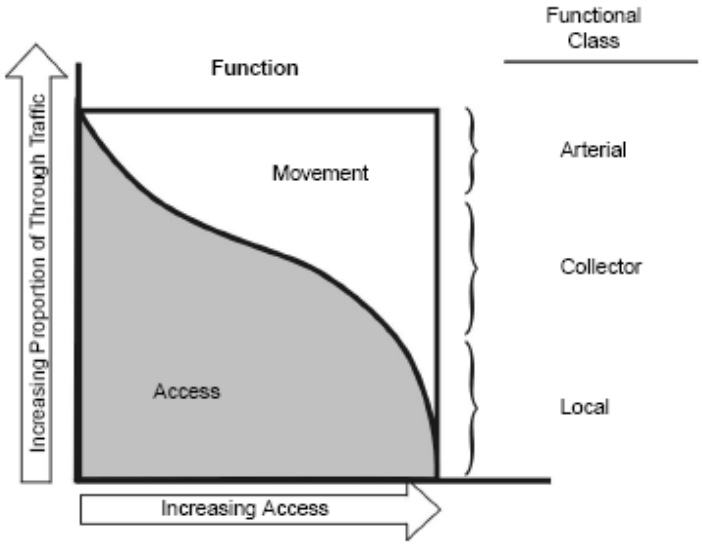


FIGURE 1
Existing Roadway System Classifications
Transportation Research Board, 2003

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 Maui County jurisdiction classified as collectors and arterials. Figures 2 through 4 depict 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 each island. 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.

The roadway network on the Island of Maui includes major highways that primarily extend from Kahului through the central valley and around the islands perimeter. Honoapiilani Highway, Kuihelani Highway, and Mokulele Highway are primary arterials that provide access through the valley.

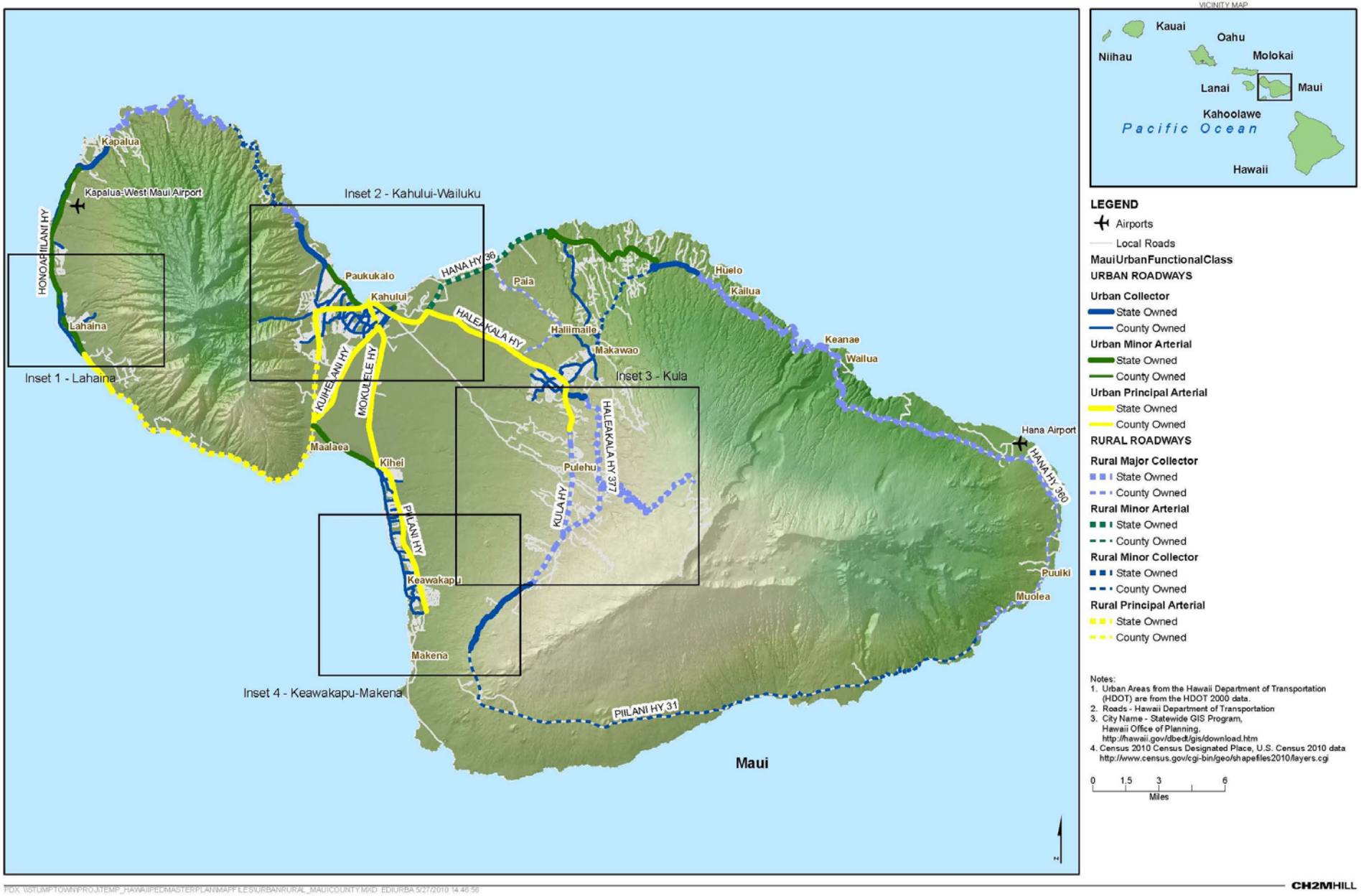


FIGURE 2
Existing Functional Classifications – Maui
HDOT, 2012

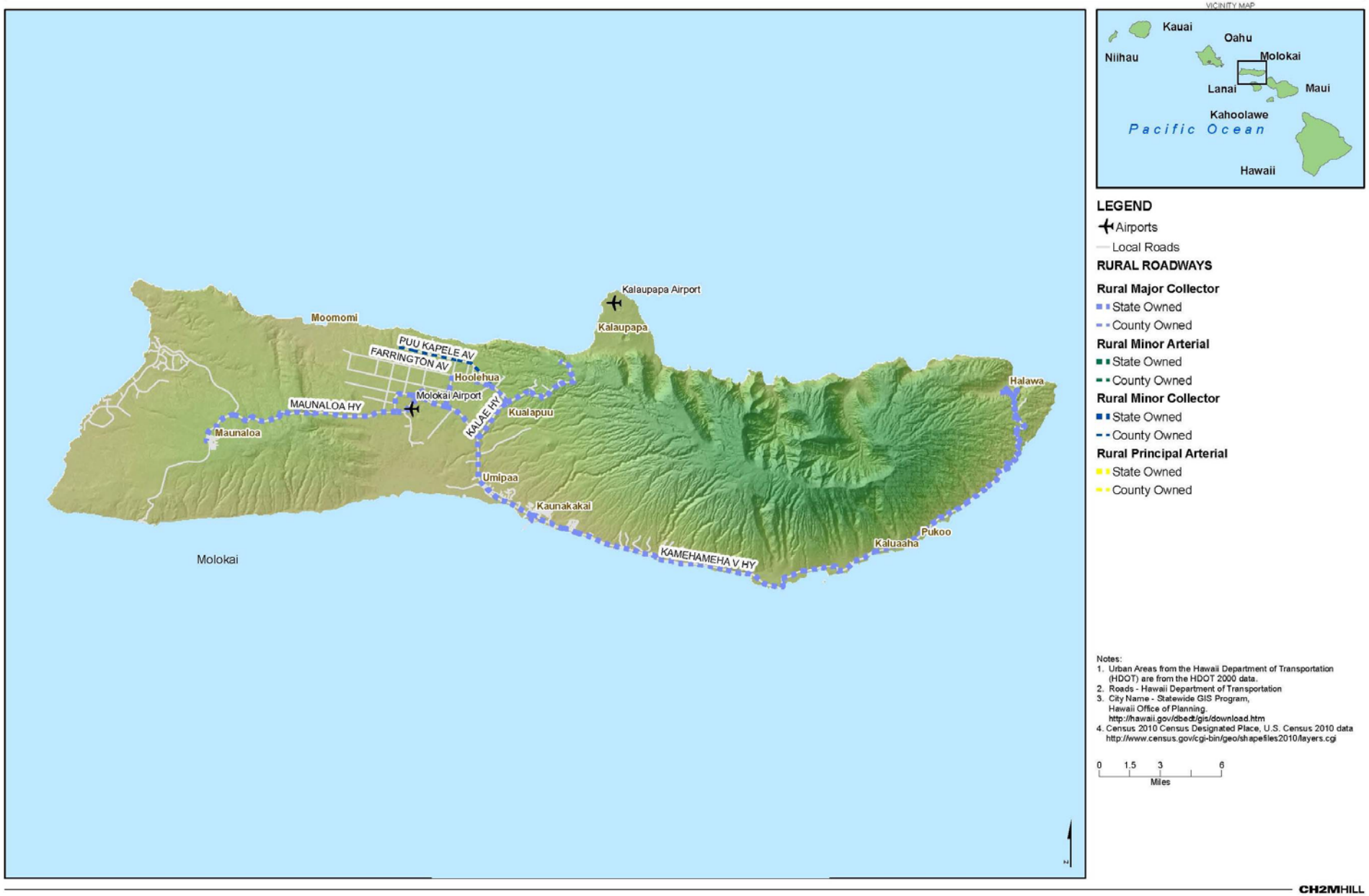


FIGURE 3
Existing Functional Classifications – Molokai
HDOT, 2012

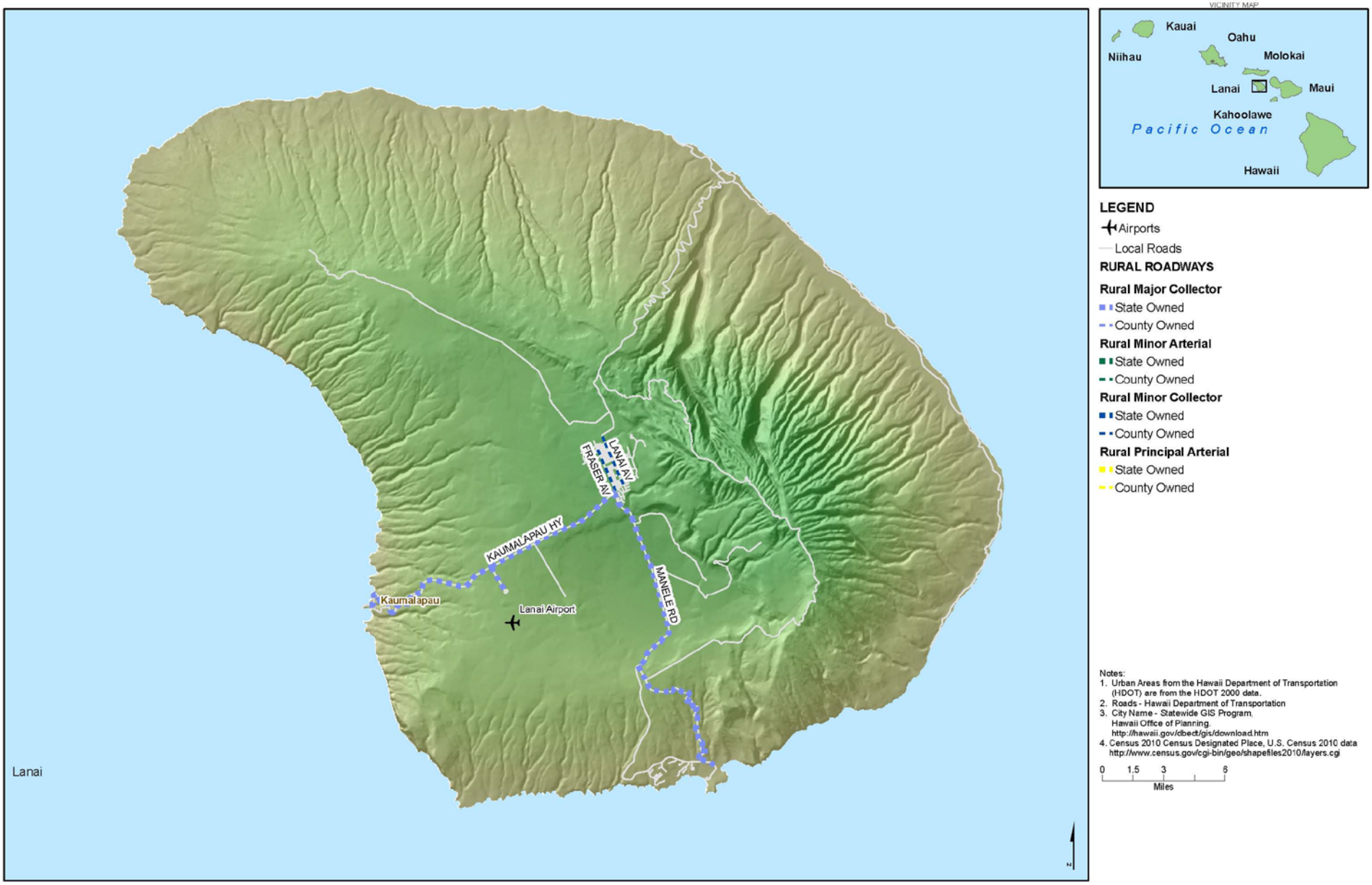


FIGURE 4
Existing Functional Classifications – Lanai
HDOT, 2012

TABLE 1
Miles of Functionally Classified Roadways – Maui, Molokai, and Lanai

Classification	Centerline Miles			Lane Miles		
	Maui	Molokai	Lanai	Maui	Molokai	Lanai
Principal/Major Arterials	68	0	0	211	0	0
Minor Arterials	25	0	0	50	0	0
Collectors	271	60	16	555	119	32
Total	**364**	**60**	**16**	**816**	**119**	**32**

HDOT, 2009

Honoapiilani Highway continues along the south shoreline of west Maui as a primary arterial but is classified as a minor arterial through Lahaina, and a collector roadway through Kapalua. Honoapiilani Highway becomes Kahekili Highway on the north shore of west Maui and is classified as a collector road. These highways serve as the primary 'belt road' access around west Maui and connects the areas towns and communities. There is no access through or across west Maui.

In east Maui, Hana Highway is classified as a primary arterial within Kahului, but similar to the Honoapiilani Highway, it becomes classified as a minor arterial then a collector as it moves away from Kahului along the perimeter of the island towards Hana on the eastern tip of the island. The highway first becomes the Piilani Highway along the island's southeast coast and then the Kula Highway as it provides access through Kula and the upcountry near Haleakala National Park. Both highways are collector roadways.

The islands of Molokai and Lanai do not have roadways functionally classified as principal or minor arterials. Collector roadways on Molokai include Kamehameha V Highway, which provides access along the south shore, and Mauna Loa Highway which provides access to the airport and the west portion of the island. Kalae Highway and portions of Farrington Avenue and Puupeelua Avenue in central Molokai are also classified as collectors. On Lanai, collector roadways include Kaumalapau Highway, Manele Road, Fraser Avenue, Lanai Avenue, and Access Road to Lanai Airport. These roadways provide access between Lanai City, Lanai Airport, Kaumalapau Harbor, and Manele Small Boat Harbor.

Existing Bikeway System

Bicycles are increasingly being recognized not only as a recreational activity, but a viable transportation mode. The Bike Plan Hawaii (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 Maui consist primarily of three types; paths, bike lanes, and signed shared roadways.

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 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 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, 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 Maui. Figure 5 shows these facilities. The solid lines represent the existing bicycle facilities. The Island of Maui has approximately 60 miles of designated bicycle facilities.

- **Paths or Shared-use Paths** – 1 mile*
- **Bike Lanes** – 22 miles
- **Sign Shared Roadways** – 38 miles

**In addition to the existing shared use paths listed in Bike Plan Hawaii, the proposed shared use path along Mokulele Highway has been completed. The shared use path is approximately 6 miles long.*

Lanai and Molokai currently do not have an existing bikeway system. Figures 5, 6, and 7 show the planned bicycle systems for these islands.

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 5 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

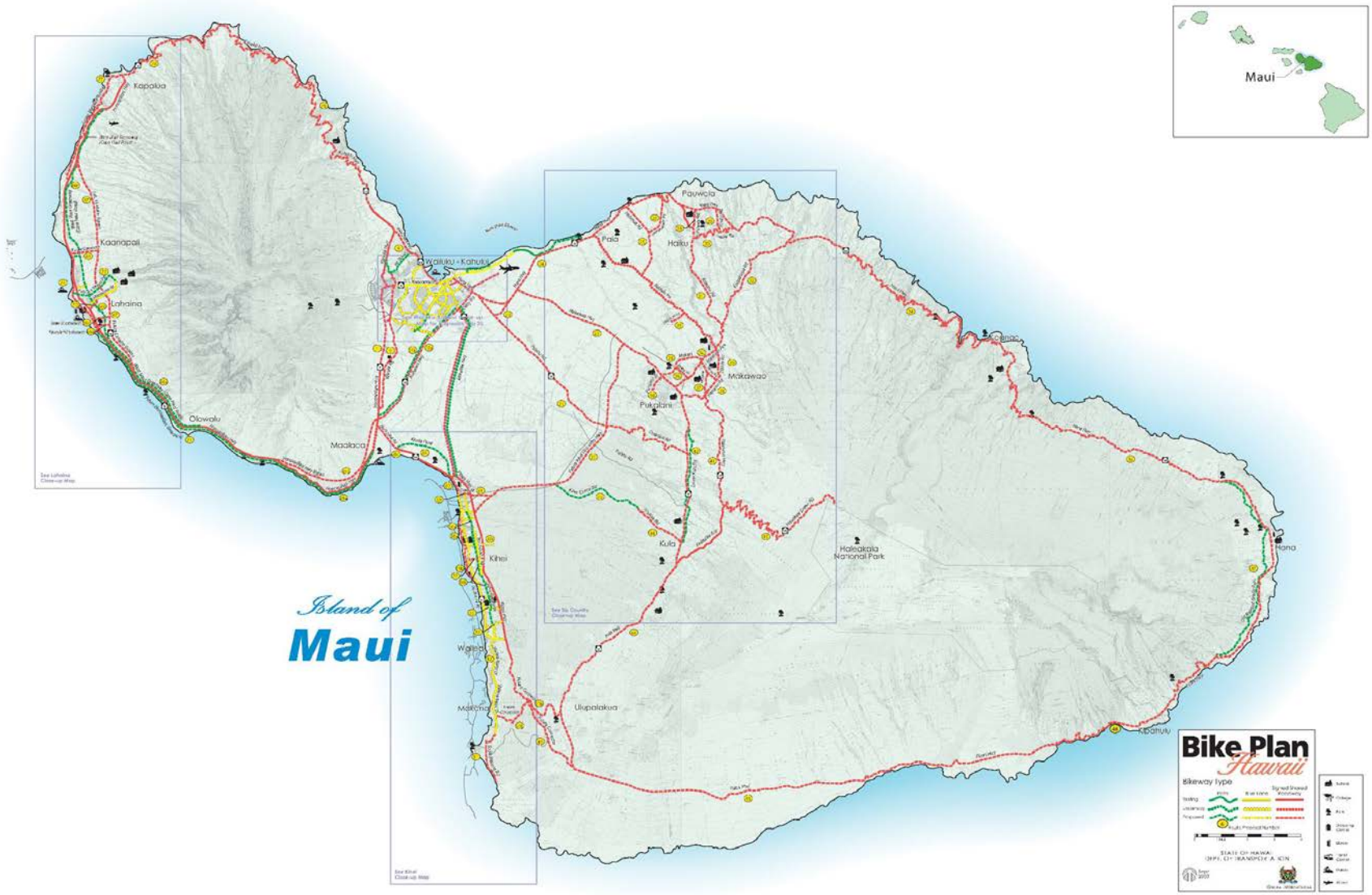


FIGURE 5
Existing and Planned Bicycle System – Maui
HDOT, 2003

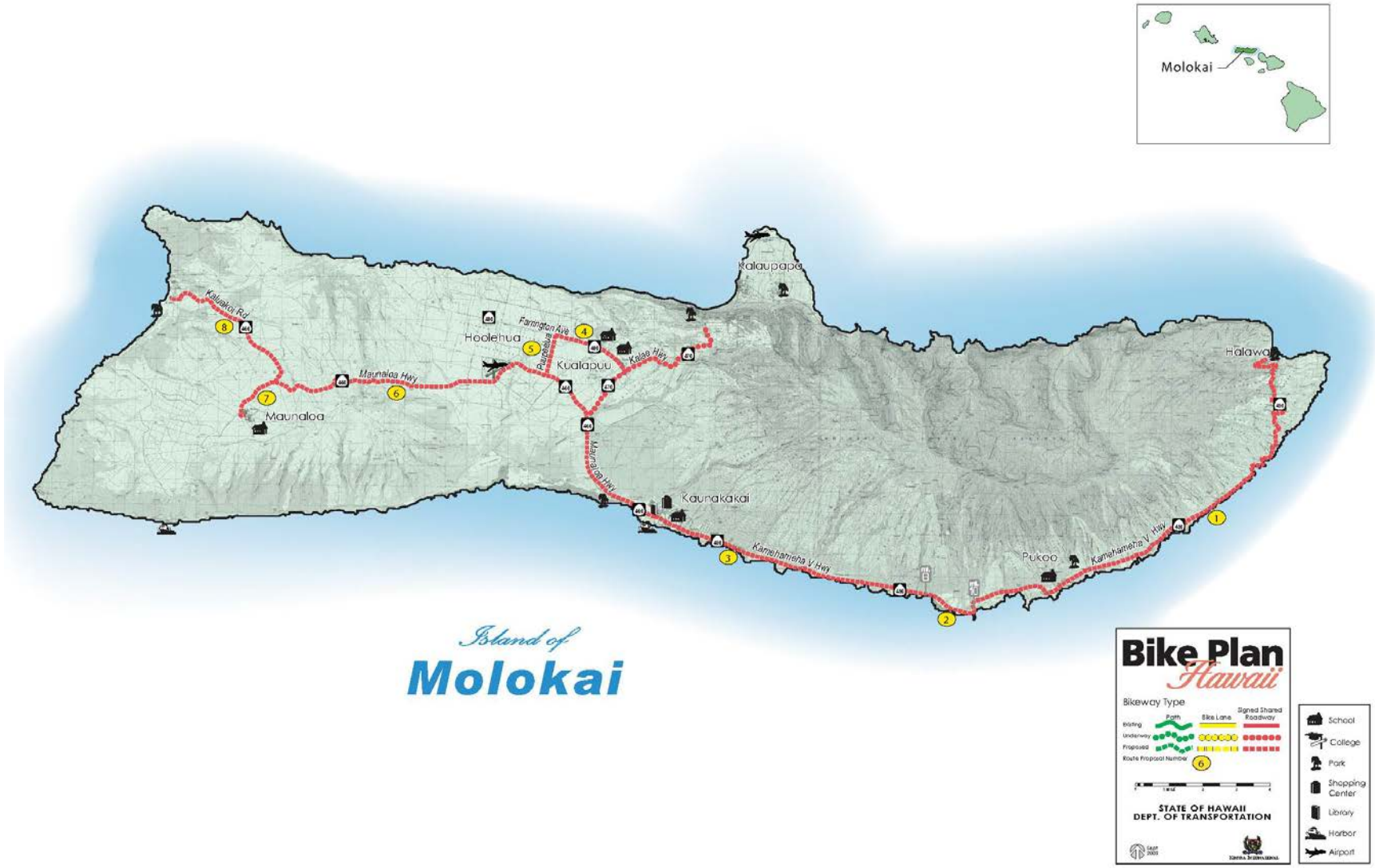


FIGURE 6
Existing and Planned Bicycle System – Molokai
HDOT, 2003

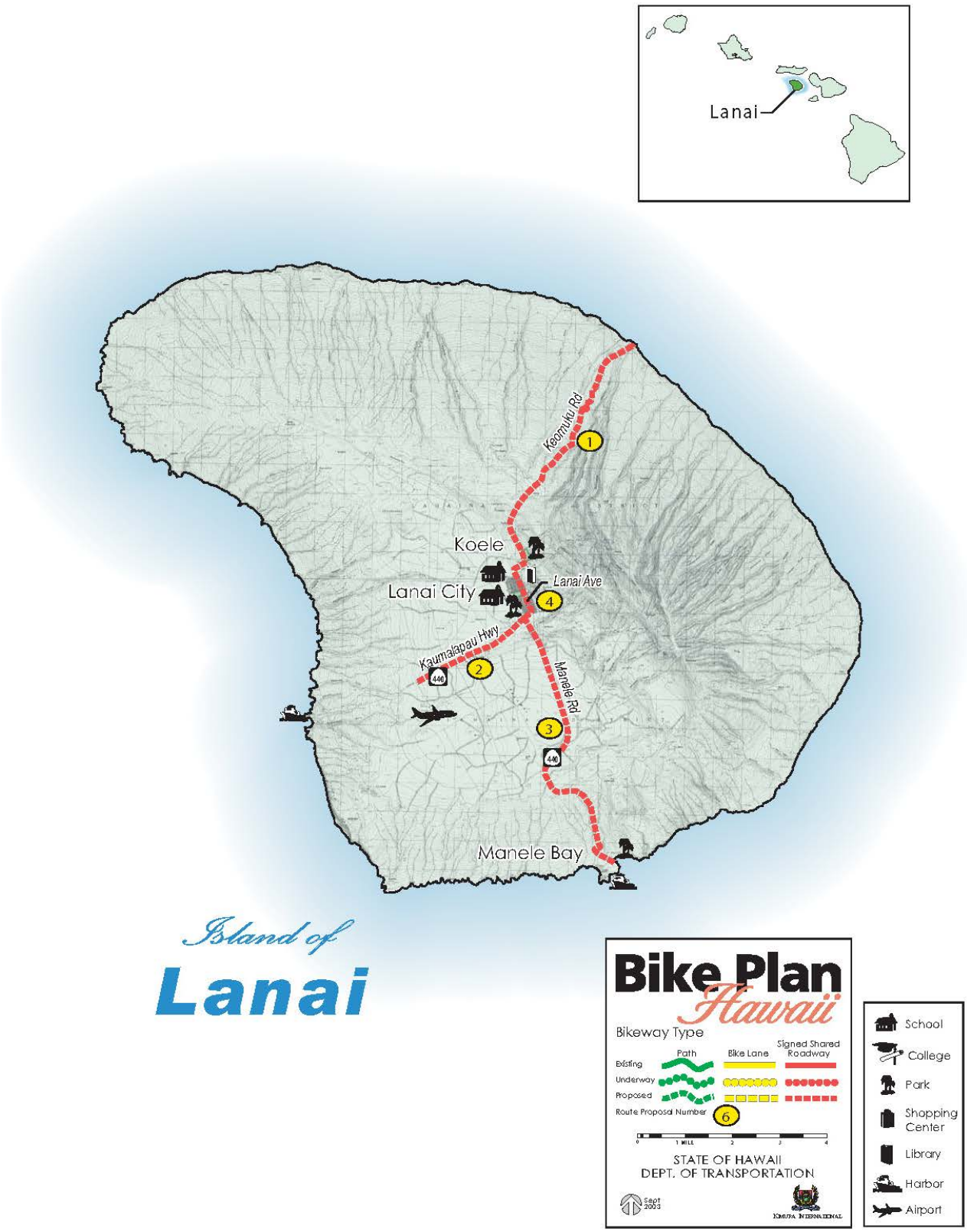


FIGURE 7
Existing and Planned Bicycle System – Lanai
HDOT, 2003

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.

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.

HDOT, 2013

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. Figures 8 and 9 show the existing state pedestrian system.

Sidewalks on the Island of Maui can be found mainly in the business and commercial areas around the island. Local roadways serving residential developments also are often characterized with a network of sidewalk connectivity. The highways that have sidewalks include Piilani Highway as it approaches Wailea Ike Drive, Kahekili Highway in the vicinity of Waihee, and Hana Highway near Hana.

The islands of Molokai and Lanai are largely rural and have few pedestrian facilities. Molokai has several short sections of highway that have sidewalks on one side: Kamehameha V Highway in Kaunakakai and Farrington Avenue in Kualapuu. Lanai has no highways with sidewalks.

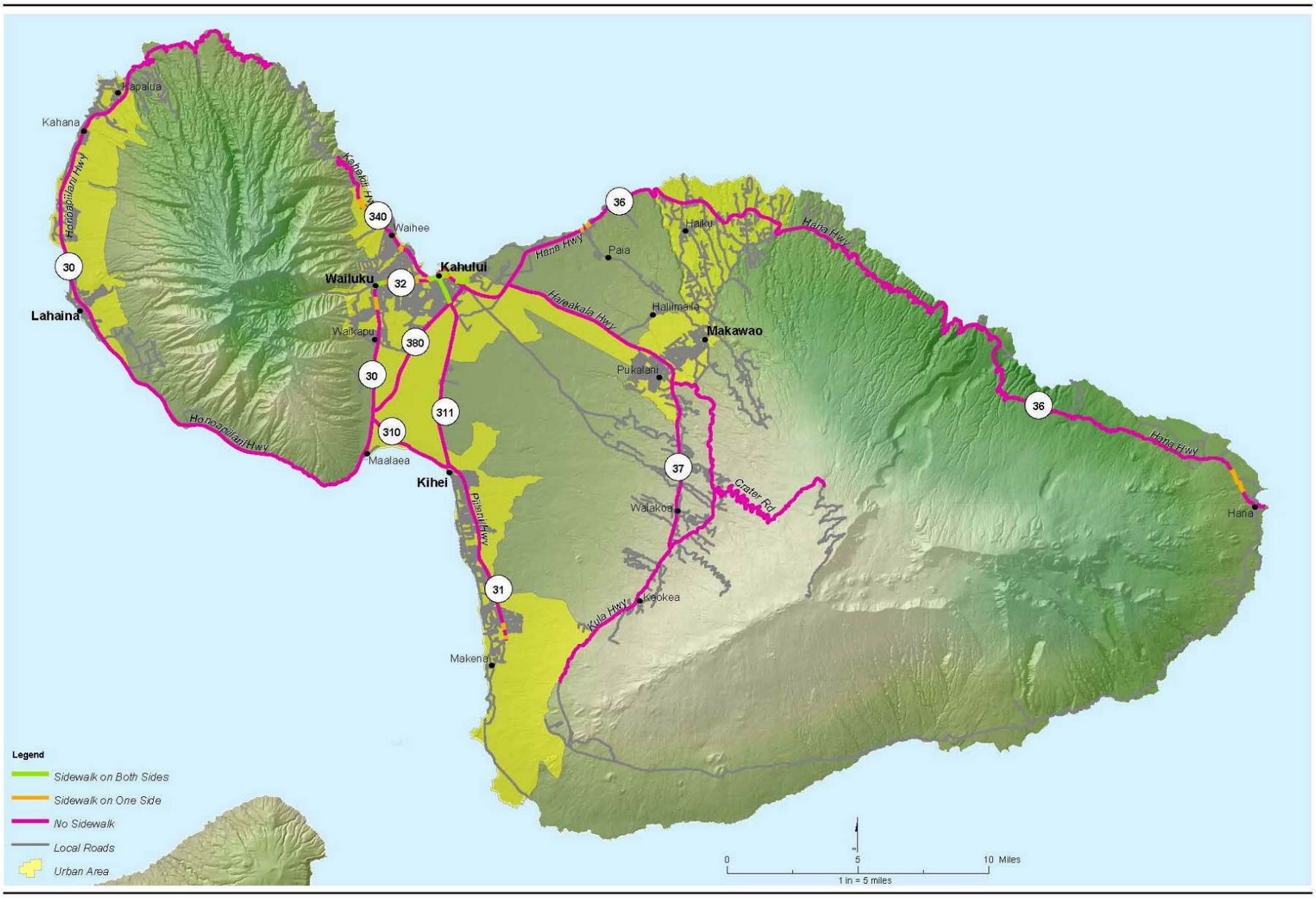


FIGURE 8
Existing State Pedestrian System
HDOT, 2013

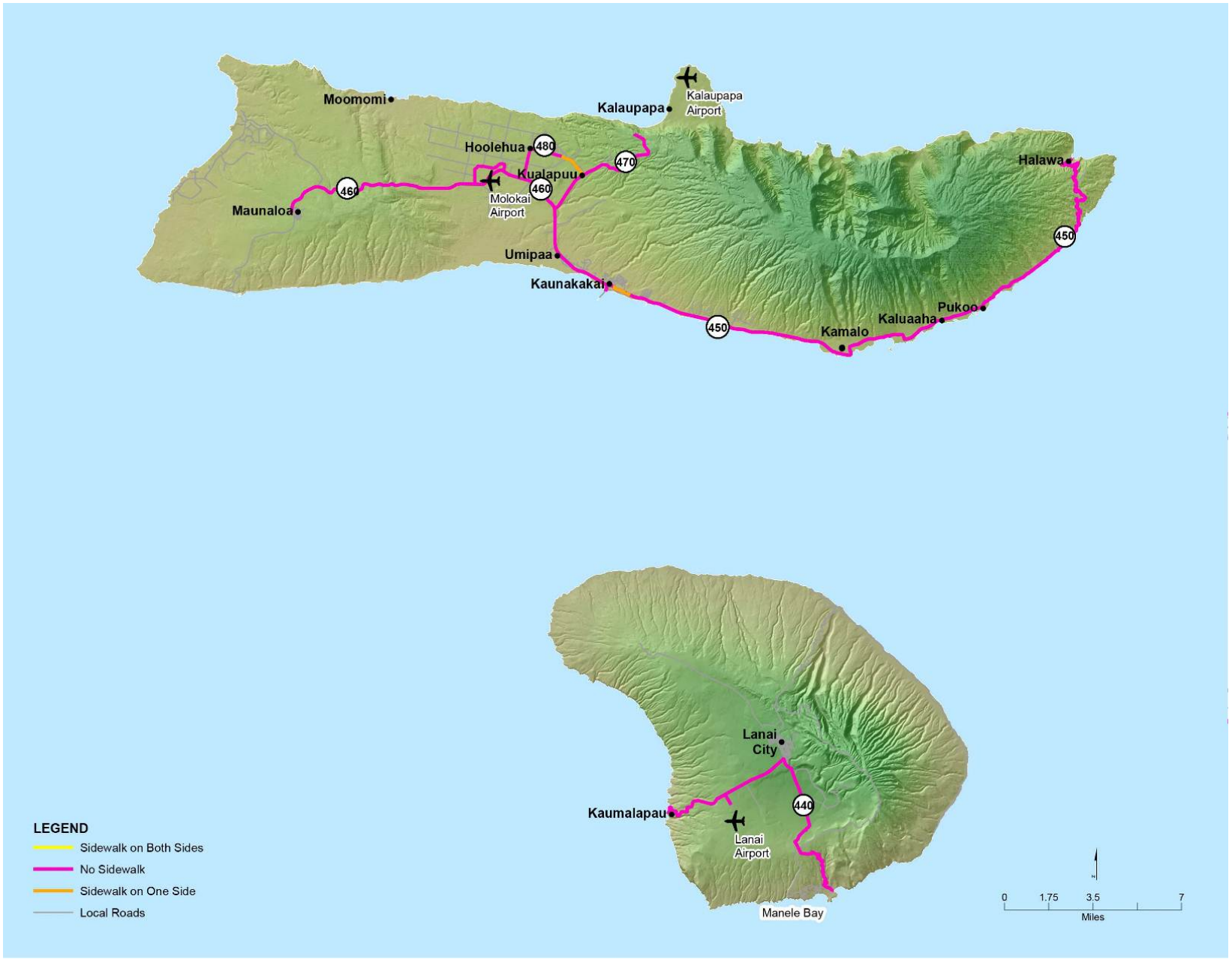


FIGURE 9
Existing State Pedestrian System
HDOT, 2013

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 use 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 contraflow lanes, high-occupancy vehicle lanes, and Intelligent Transportation Systems.

Maui Department of Transportation's mission is to provide high quality, fixed route and paratransit mobility at a reasonable cost by:

- **Providing a transit system that effectively meets community needs and improves the quality of life.**
- **Operating and managing the transit system efficiently.**
- **Providing accessible transit services.**

Source: County of Maui, 2005

The Maui Bus system is described in the next section. There are currently no other TDM or TSM programs or operations on the islands of Maui, Molokai, or Lanai.

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 Maui Short-Range Transit Plan (County of Maui, 2005) developed a stakeholder driven vision for the Maui Bus system to provide high-quality, affordable public transit.

The public transit system includes transit and paratransit services, transit centers, park-and-ride facilities, and transit stops.

Transit services on the Island of Maui are provided by the Maui Bus. The system comprises general fixed-route public transit service, commuter transit service and a paratransit program. Figure 10 shows the existing service route areas. Twelve bus routes provide service within and between central, south, and west Maui, Haiku and upcountry areas. Commuter service is another option between these areas. It is provided by four routes, and the service operates in the morning and in the afternoon in the major commute direction.

Two park-and-ride lots are provided on Maui: one is in Kahului at Puunene Avenue and Kuihelani Highway, the other is near Maalaea at Honoapiilani Highway and North Kihei Road.

The Americans with Disabilities Act Paratransit Program ensures that persons with disabilities that are unable to use the fixed-route public transit may make advanced reservations for curbside service. This service is limited to areas within 0.75 mile from a transit route.

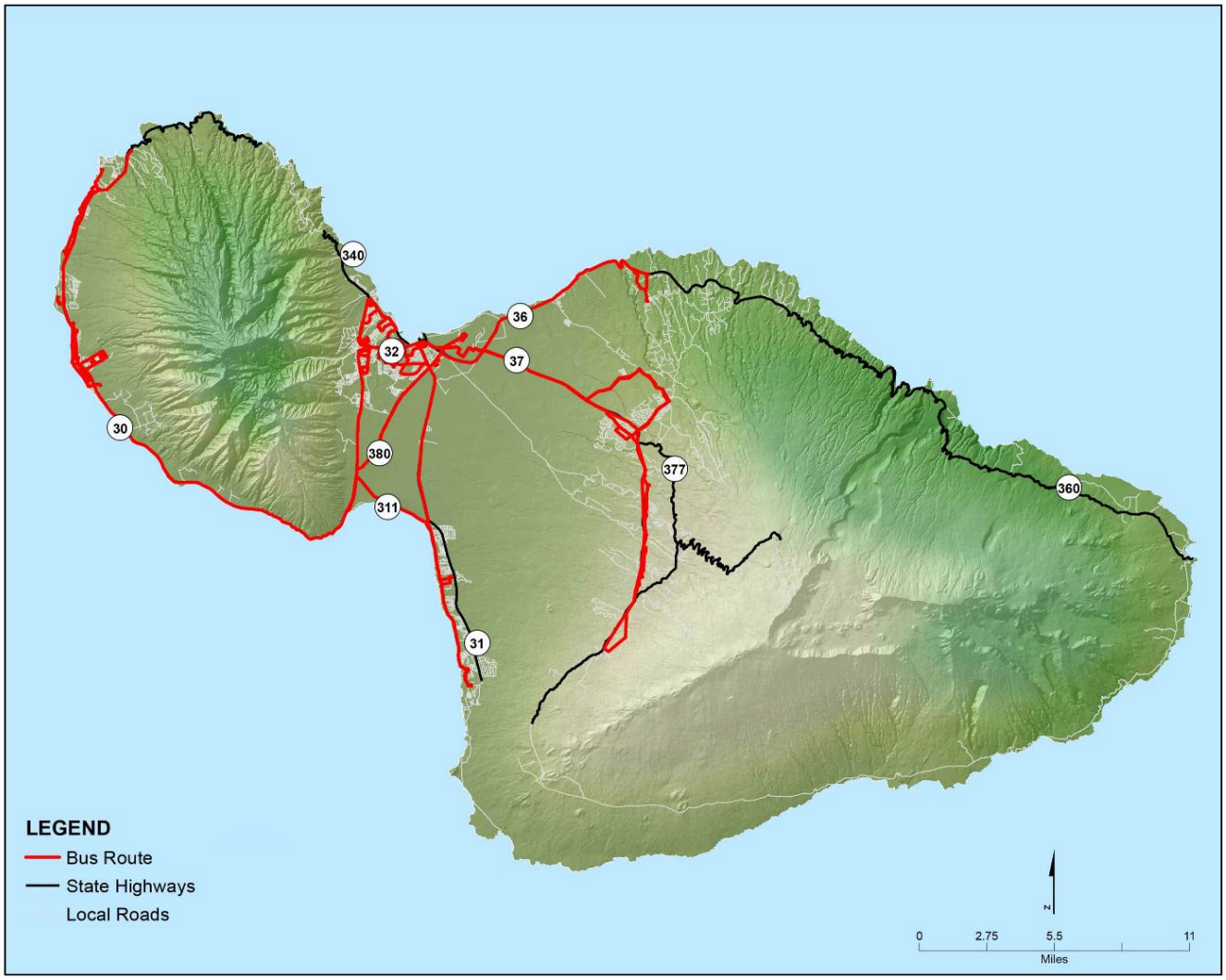


FIGURE 10
Existing Maui Public Transit Routes
HDOT, 2013

Maui Economic Opportunity, Inc. (MEO) also provides transportation services to qualified participants on Maui, Molokai, and Lanai. The MEO provides service to the doctor, work, school, adult daycare, and necessary shopping through a variety of grant funded programs. Services are generally provided for seniors, disabled, youth, and rural areas.

MEO transportation services provided via County of Maui grant appropriation:

- Kaunoa Leisure Program
- Senior Nutrition Program
- Ka Lima O Maui Program
- Employment for the Disabled, Low-income and Economically Challenged
- Rural Shuttle
- Youth (Maui & Moloka'i)
- Easter Seals & Adult Day Care
- Community (Expansion)
- Youth (Expansion)
- Ala Hou
- Dialysis
- Head Start Program
- Medicaid
- Maui Memorial Medical Center
- Hospice of Maui
- Independent charter

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 airports harbors and use many of the arterial roadways to transport goods to market throughout the islands.

Maui's commercial harbor is the Kahului Harbor on the north side of the island along Kaahumanu Avenue. The main access to the harbor occurs from Wharf Street and Hobron Avenue. Ancillary access to the harbor is also available along Puunene Avenue. From Kahului Harbor, freight vehicles access Kuihelani Highway and Honoapiilani Highway to deliver goods to the Kapalua/Kaanapali/Lahaina resort areas on the west side of the island. Mokulele Highway carries freight vehicles and goods from the port to the Kihei/Makena area, while Hana Highway on the north side of the island is the main transport route for goods to the east side of the island.

Goods delivered to or received at the islands' airports are transported in freight vehicles via the same highways. Kahului Airport, on the east side of Kahului, can be accessed via Hana Highway.

Molokai's commercial harbor is the Kaunakakai Harbor. It is located on the south side of the island, along Mauna Loa Highway/Kamehameha V Highway. Kaunakakai Place and Mohala Street are the two roadways that provide access between the harbor and the highway system. Freight vehicles from Kaunakakai Harbor use Mauna Loa Highway and Kalae Highway to transport goods into the business and commercial center of the island.

Lanai's commercial harbor is the Kaumalapau Harbor. It is located on the west side of the island, at the west terminus of Kaumalapau Highway. Lanai Airport is also on Kaumalapau Highway between the harbor and Lanai City. From the harbor or the airport, freight is transported on Kaumalapau Highway to Lanai City, and on Manele Road to the resort area on the south side of 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 0.5 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 primarily comprise 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 administrated 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
Maui	465,800	22,823	194,836	244,088	4,053
Lanai	90,500	3,257	38,197	46,639	2,407
Molokai	165,800	2,539	49,768	111,627	1,866

[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.

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

Approximately half of Maui's land use consists of agricultural district. Conservation districts comprise of approximately 40 percent of the island. Urban land use districts are less than 5 percent of the land area, and are concentrated within the Kahului, Wailuku, Kihei/Makena, Lahaina/Kaanapali/Kapalua, and Pukalani/Makawao areas. Rural Districts are also limited in size and are concentrated in the Upcountry area.

Molokai comprises almost entirely agricultural and conservation lands. Urban and rural districts comprise of less than 3 percent of the land use on the island. These areas are located along the southwest coast of the island, as well as Kalaupapa, Kalae/Kualapuu, Maunaloa, and Kaluakoi Resort.

Lanai similarly has a large portion of agricultural and conservation lands. Urban and rural districts comprise approximately 6 percent of the land use on the island. These areas include the Lanai airport area, the area surrounding Kaumalapau Harbor, Lanai City, Manele Bay, and the east coast of the island.

Figures 11 through 13 show the State Land Use Districts for Maui, Molokai, and Lanai.

Existing Community Plan Areas

There are nine Community Plans in Maui County; Hana, Kahoolawe, Lanai, Molokai, Kihei-Makena, Makawao-Pukalani-Kula, Paia-Haiku, Wailuku-Kahului, and West Maui. Each of the plans reflects current and anticipated conditions, and advances planning goals, objectives, policies, and implementation considerations for the designated community.

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. The urban/town and land use related goals of the community plans are summarized in Table 3.

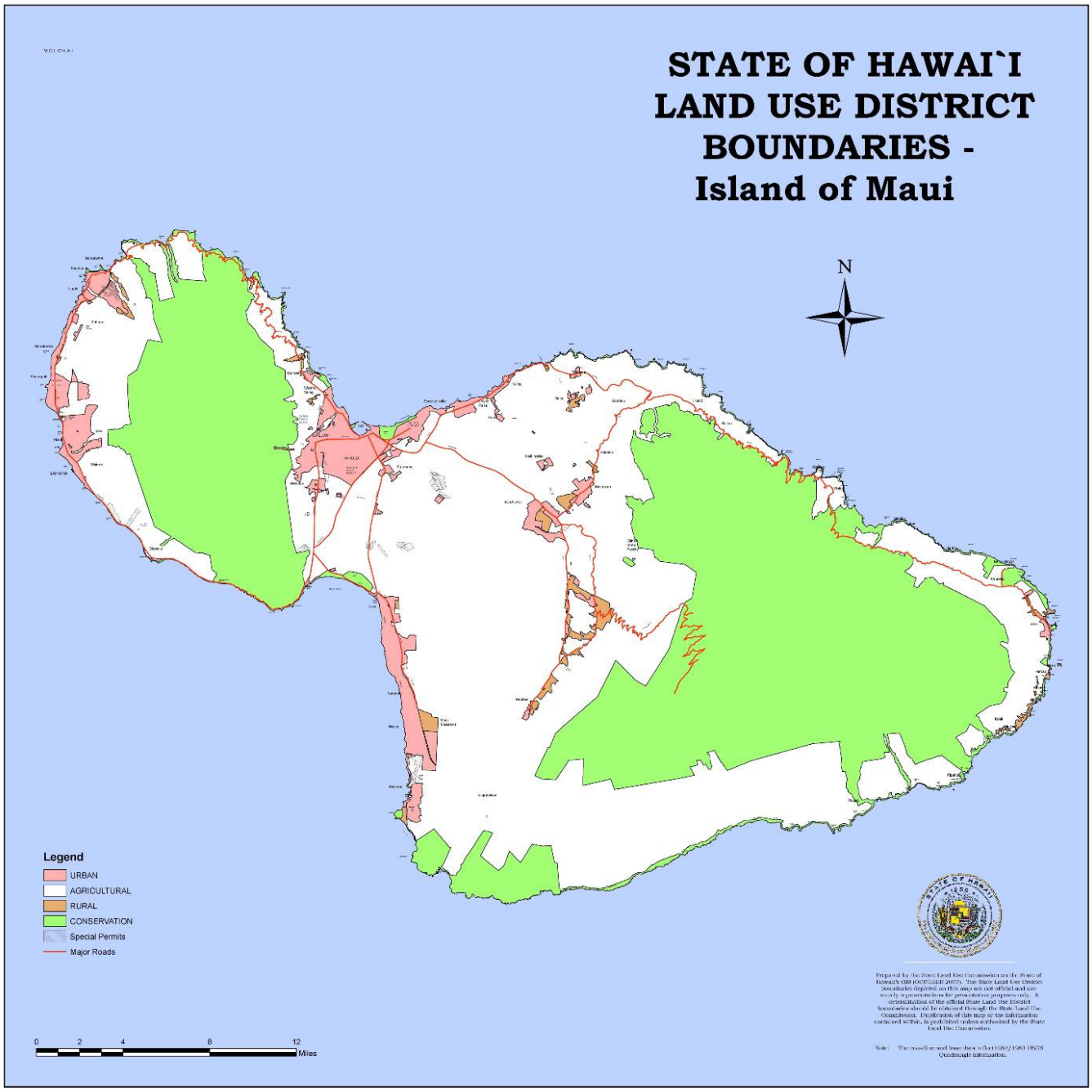


FIGURE 11
Existing State Land Use District Boundaries – Island of Maui
State of Hawaii LUC, 2007

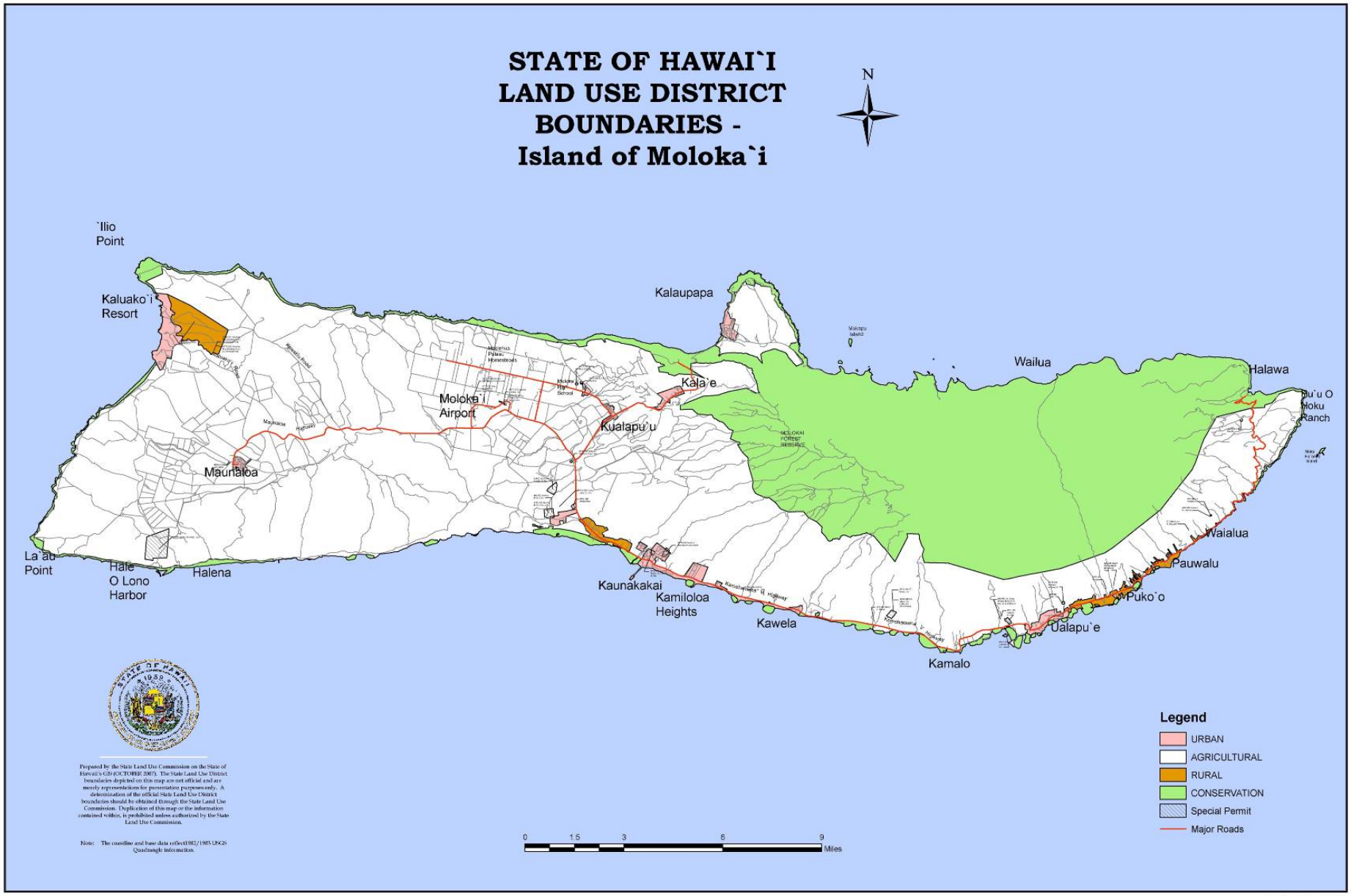


FIGURE 12
Existing State Land Use District Boundaries – Island of Molokai
State of Hawaii LUC, 2007

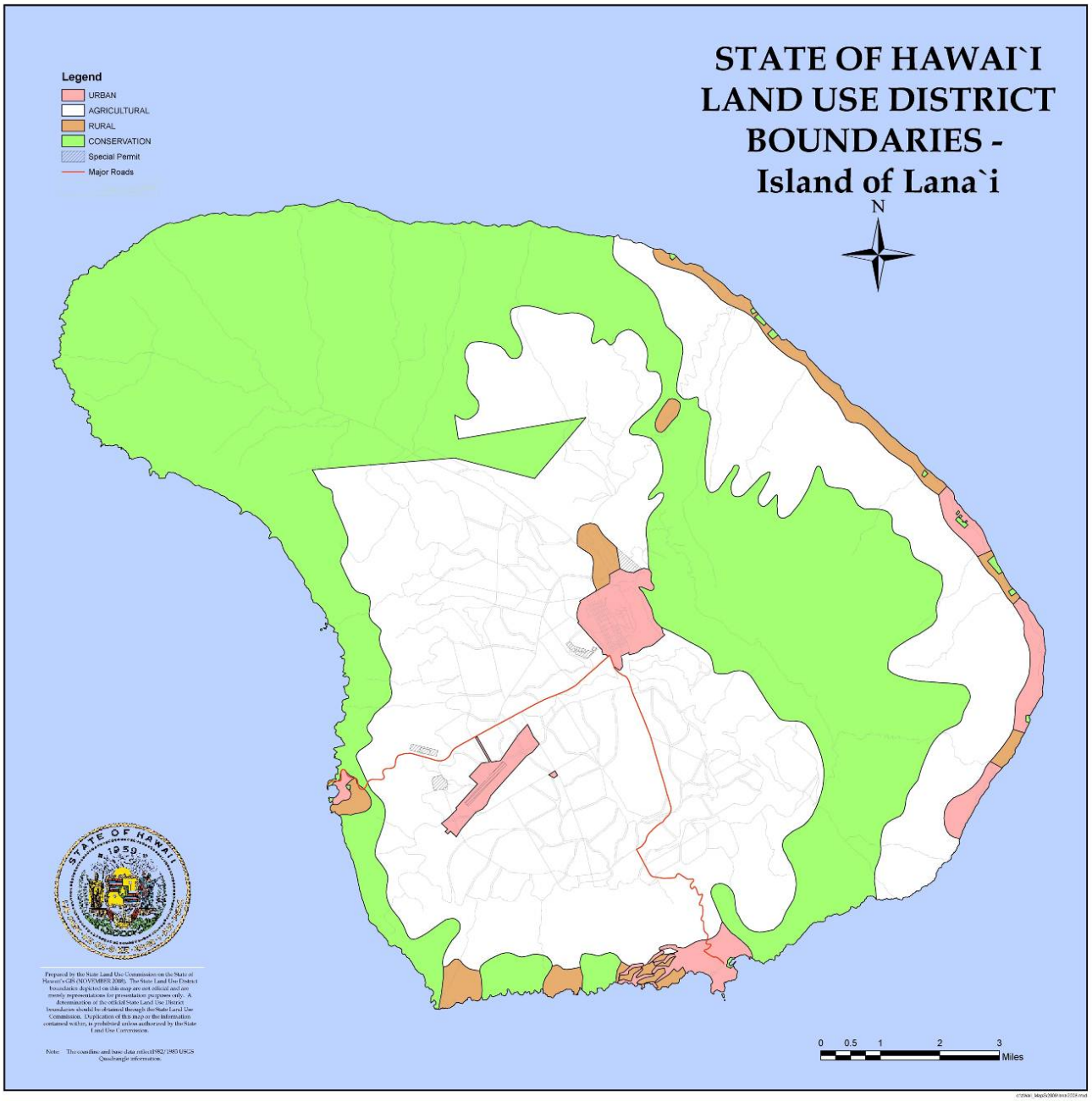


FIGURE 13
Existing State Land Use District Boundaries – Island of Lanai
State of Hawaii LUC, 2008

TABLE 3
Community Plan Land Transportation-related Goals

Community Plan	Urban/Town and Land Use Goals
Hana	Maintain harmony between the natural and constructed environments through building, infrastructure, and landscaping design which ensures that the natural beauty and character of the Hana region is preserved.
Kahoolawe	n/a
Lanai	Preserve and enhance the unique urban design character of Lanai through consideration of planning, land use, and design standards that respect the island's rural plantation history.
Molokai	Maintain harmony between the natural and constructed environments to ensure that the natural beauty and character of Molokai is preserved. Enhance the unique qualities of the Island of Molokai to provide future generations the opportunity to experience the rural and traditional lifestyles.
Kihei-Makena	Create a well-planned community with land use and development patterns designed to achieve the efficient and timely provision of infrastructure and community needs while preserving and enhancing the unique character of Maalaea, Kihei, Wailea, and Makena as well as the region's natural environment, marine resources, and traditional shoreline uses.
Makawao-Pukalani-Kula	Recognize and preserve the unique design characteristics of the Makawao, Pukalani, and Kula communities in order to enhance Upcountry's man-made environment. Maintain and enhance Upcountry's unique and diverse rural land use character with sensitivity to existing land use patterns, natural resource values, and economic and social needs of the region's residents.
Paia-Haiku	Develop an attractive rural town development in keeping with the existing scale, form, and character of settlement areas in the region. Create a well-planned community that preserves the region's small town ambiance and rural character, coastal scenic vistas, and extensive agricultural land use, and accommodates the future needs of residents at a sustainable rate of growth and in harmony with the region's natural environment, marine resources, and traditional uses of the shoreline and mauka lands.
Wailuku-Kahului	Develop an attractive and functionally integrated urban environment that enhances neighborhood character; promotes quality design; defines a unified landscape planting and beautification theme along major public roads and highways, watercourses, and at major public facilities; and recognizes the historic importance and traditions of the region. Create an attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for the social and economic well-being of residents and the preservation and enhancement of the region's environmental resources and traditional towns and villages.
West Maui	Develop an attractive and functionally integrated urban environment that enhances neighborhood character, promotes quality design at the resort destinations of Kaanapali and Kapalua, defines a unified landscape planting and beautification theme along major public roads and highways, watercourses and at major public facilities and recognizes the historic importance and traditions of the region. Create an attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for stable social and economic well-being of residents and the preservation and enhancement of the region's open space areas and natural environment.

County of Maui, 1994-2002

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 Maui.

Population

Table 4 summarizes the population within Maui County by districts. The majority of the Island of Maui's population resides in the Wailuku-Kahului district (35 percent) and the Kihei-Makena district (19 percent). The Hana district on the east coast of the island is the least populated and includes 2 percent each of the island's total population. Lanai accounts for 2 percent and Molokai accounts for 5 percent of the total region population. The planning districts for the Island of Maui are shown in Figure 14.

TABLE 4
Existing Population

Planning District	Population	Percent of Total
Molokai	7,350	5%
Lanai	3,140	2%
Hana	2,170	2%
Kihei-Makena	28,310	19%
Makawao- Pukalani-Kula	20,240	14%
Paia-Haiku	12,580	9%
Wailuku-Kahului	51,410	35%
West Maui	20,490	14%
Total	145,690	100%

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

A portion of Maui's population currently 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. Less than 5 percent of the population in the majority of the Wailuku-Kahului and West Maui districts lives below the poverty line. In Kahului town and in communities located between Lahaina and Maalaea, up to 20 percent of the population is considered to live below the poverty line. In Paia and certain communities between Kihei and Wailea, between 20 and 40 percent of the population is below the low-income threshold.

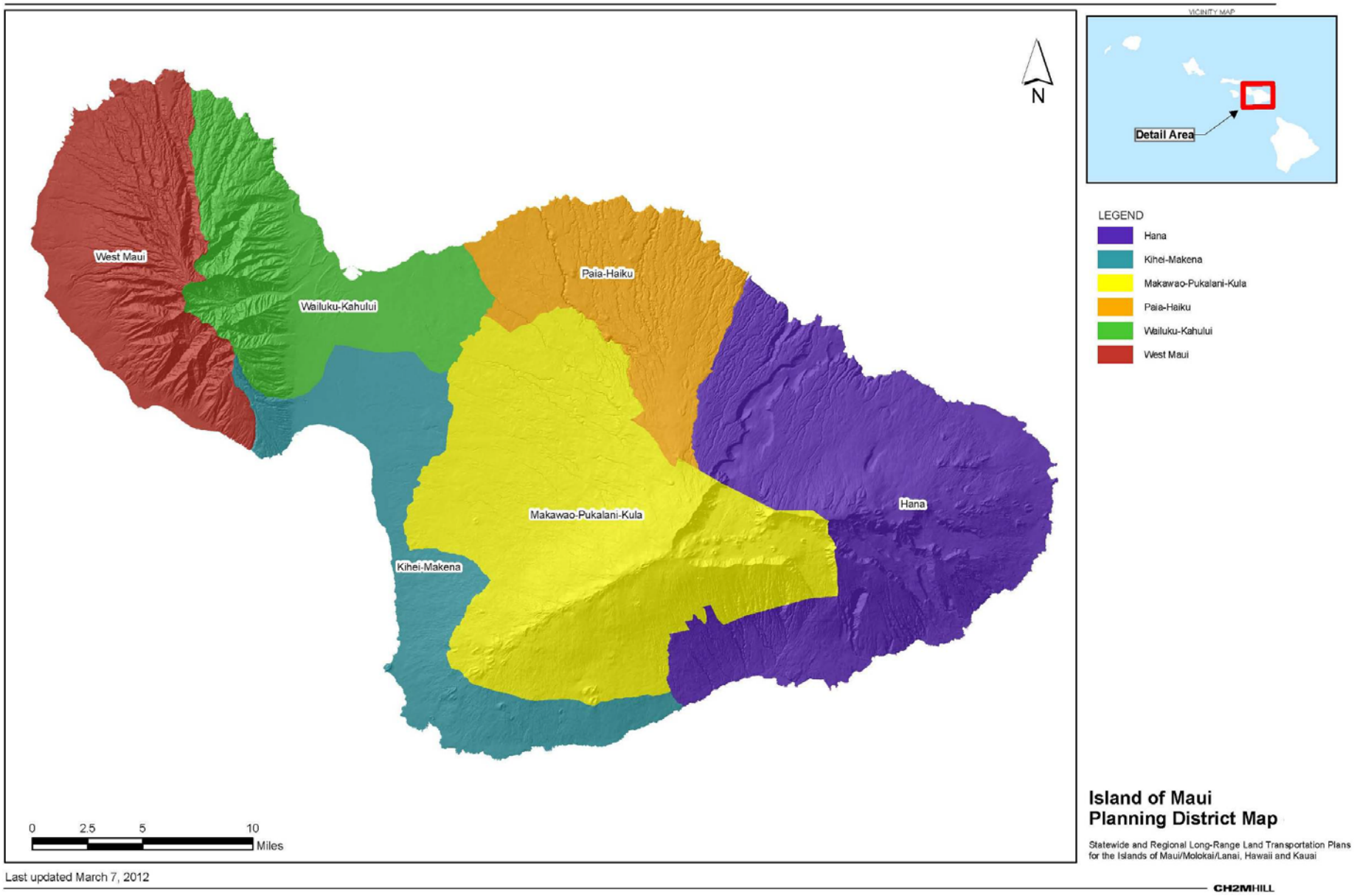


FIGURE 14
Existing State Planning District Boundaries
County of Maui Planning Department, 2012

On the Island of Lanai, less than 5 percent of the population lives below the poverty line. Up to 40 percent of the population in west Molokai, and up to 20 percent of the population in east Molokai, currently lives below the poverty line.

Households

Table 5 summarizes the households within Maui County by districts. The distribution of households in the region is similar to the population distribution with the majority of households located in either the Wailuku-Kahului district (approximately 30 percent of households) or the Kihei-Makena district (approximately 21 percent of all households). The Hana district and the Island of Lanai each contain approximately 2 percent of all households in Maui County. Figure 15 illustrates the number of households throughout the Island of Maui.

TABLE 5
Existing Households

Planning District	Households	Percent of Total
Molokai	2,580	5%
Lanai	1,160	2%
Hana	750	2%
Kihei-Makena	10,690	21%
Makawao- Pukalani-Kula	8,600	17%
Paia-Haiku	4,840	9%
Wailuku-Kahului	15,270	30%
West Maui	7,060	14%
Total	**50,950**	**100%**

State of Hawaii Department of Business, Economic Development, and Tourism, 2011
Maui County Assessor Data, 2011

Employment

There were approximately 73,750 jobs in Maui County in 2007, as summarized in Table 6.

TABLE 6
Existing Employment

Planning District	Employment	Percent of Total
Molokai	2,350	3%
Lanai	1,700	2%
Hana	550	1%
Kihei-Makena	13,450	18%
Makawao- Pukalani-Kula	4,850	7%
Paia-Haiku	1,490	2%
Wailuku-Kahului	32,840	45%
West Maui	16,520	22%
Total	**73,750**	**100%**

Lanai and Molokai Hawaii Workforce Infonet, 2007
Hawaii Department of Labor and Industrial Relations, 2007

Employment in Maui County was concentrated in the Wailuku-Kahului district (45 percent of jobs). The West Maui district (including Kaanapali and Lahaina) supports approximately 22 percent of the total job opportunities on the island, while the Kihei-Makena district supports approximately 18 percent of jobs. Each of the remaining districts has less than 10 percent of the total employment positions. On the Island of Maui, approximately 25,000 jobs were in service occupations and 10,000 jobs were in retail occupations.

Military employment on Maui accounts for less than 1 percent of the island's total employment positions. These positions are considered public service occupations, and employees are primarily located at recruiting facilities or at various supporting facilities throughout the island (such as the Army National Guard Armory or the Air Force Maui Optical and Supercomputing observatory). There are no active military bases on Maui. Figure 16 illustrates the number and location of jobs throughout the Island of Maui.

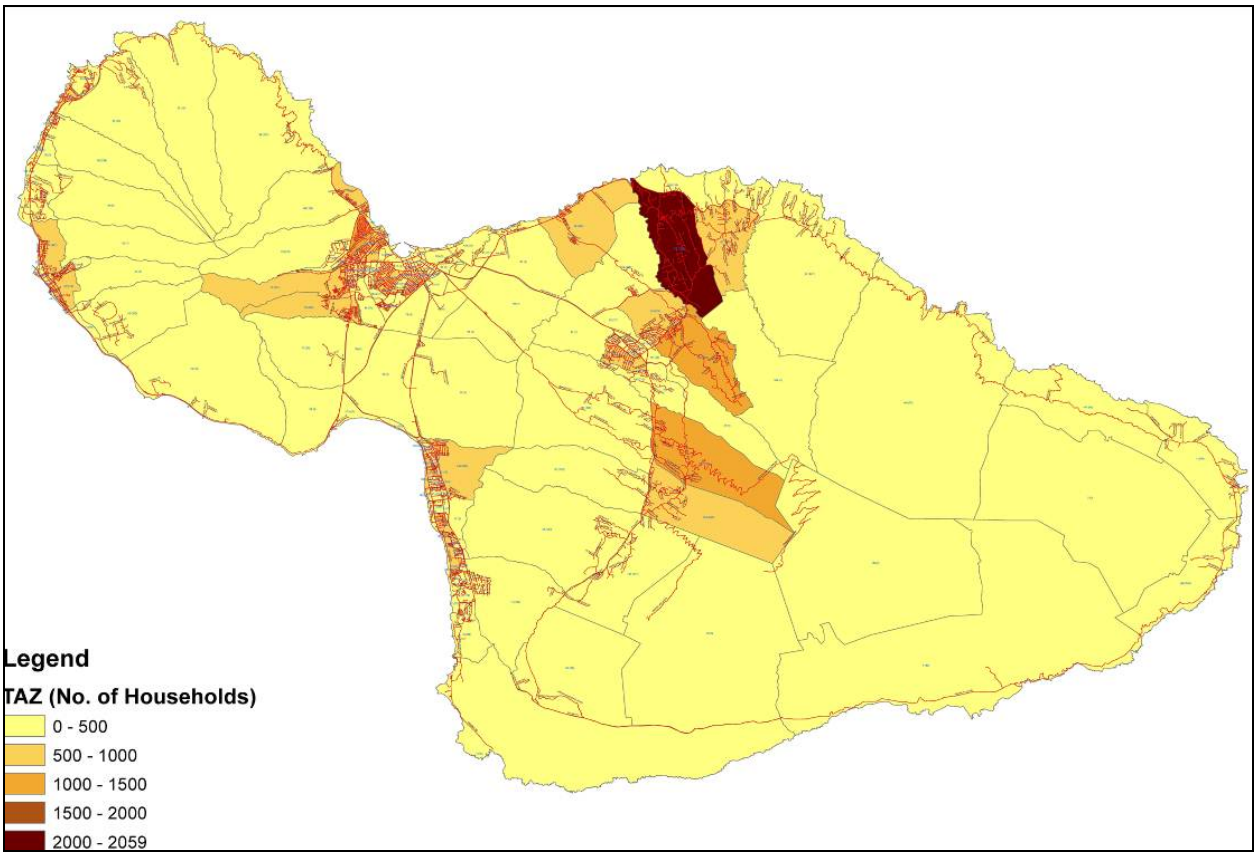


FIGURE 15
Existing Households

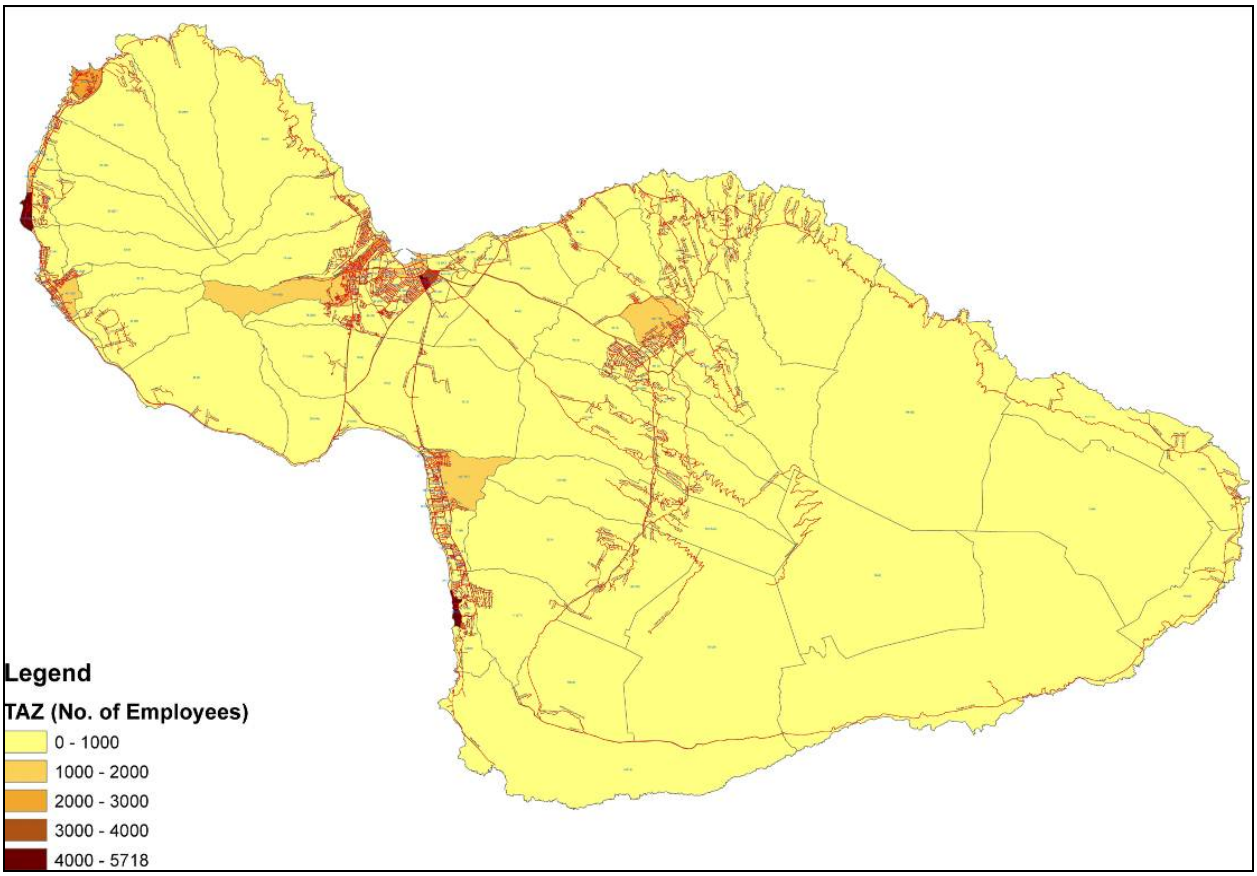


FIGURE 16
Existing Employment

Visitor Industry

The visitor industry is Maui's leading economic sector. The airports within the county conveyed nearly seven million air passengers during 2007. The Island of Maui accommodated approximately 95 percent of these passengers, with approximately 6.6 million passengers within the Kahului, Kapalua, and Hana airports. Molokai Airport had nearly 240,000 passengers and Lanai Airport had 128,000 passengers (HDOT, 2008).

Kahului Harbor also services the visitor industry through cruise ship accommodations. The HDOT Harbors Division estimated that nearly 497,000 cruise ship passengers were accommodated at Kahului Harbor in 2007.

In 2007, there were over 19,200 visitor accommodations on the Island of Maui. The areas characterized by the greatest number of hotel rooms were located in Kihei and Kaanapali. The islands of Molokai and Lanai had approximately 310 and 350 visitor accommodation units, respectively (State of Hawaii 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 Haleakala National Park, Maui Ocean Center, Iao Valley State Monument, and the Whalers Village Museum. Molokai's most visited attractions in 2007 were Kalaupapa National

Historic Park, and Kalaupapa Settlement. Visitor attractions were not recorded for the Island of Lanai.

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 thirty-five thousand tons of cargo was handled during 2007. The Island of Maui accommodated approximately 95 percent of this cargo, through the Kahului, Kapalua, and Hana airports. Molokai Airport conveyed 1,133 tons, Kalaupapa 159 tons and Lanai 856 tons.

Hawaii Department of Transportation Harbors Division recorded over three million tons of cargo through the Kahului Harbor. No information was available for existing cargo tonnage through Kaumalapau Harbor on Lanai or Kaunakakai Harbor on Molokai.

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

Average daily traffic volumes, as estimated by the travel demand model, on Mokulele Highway between Kahului and Kihei peak at approximately 33,600 vehicles per day in both directions. Within Kihei, highway volumes gradually increase to 36,400 vehicles per day in both directions on Piilani Highway due to traffic from North Kihei Road.

Between Kahului and Maalaea, volumes on Honoapiilani Highway are in the range of 15,400 vehicles per day, while Kuihelani Highway carries approximately 17,000 vehicles per day in both directions as estimated by the travel demand model. Just south of where the highways merge near Maalaea, daily traffic on Honoapiilani Highway increases to 35,000 vehicles in both directions. Further west, daily traffic volumes decrease to 30,800 vehicles per day near Lahaina and to 39,100 vehicles per day approaching Kaanapali.

On Hana Highway east of Kahului, average daily traffic volumes peak at approximately 21,000 daily vehicles and decrease gradually to 7,800 daily vehicles in both directions near Haiku. The roadway network on the islands of Molokai and Lanai were not analyzed in a travel demand model due to the low number of facilities on the federal-aid system.

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 in 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 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 roadways federal functional classification. Link classification may not exactly match the roads federal functional classification due to adjustments made during the model validation process. Adjustments to link classifications were made to align observed traffic with the models traffic assignment.

As estimated by the 2007 travel demand forecast model, 24 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. Honoapiilani Highway between Maalaea and Lahaina is categorized as a principal arterial, and currently operates at LOS F along the majority of this segment. Vehicle demand exceeds capacity and congestion occurs because the majority of all trips destined to the resort areas of west Maui must use this highway.

Within Kahului, principal arterials that experience congestion include portions of Puunene Avenue and Kaahumanu Avenue, and Hana Highway between Kaahumanu Avenue and Dairy Road. These roadways serve as primary circulation routes in Kahului and provide local access to businesses and retail within the core downtown area. They are also attractive choices for regional traffic as they provide direct access to Honoapiilani Highway, Mokulele Highway, and Kuihelani Highway.

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: Transportation Research Board, 2010

Although the table below indicates that daily traffic volumes are at or exceed the daily capacity of the roadway on sections of links classified as principal arterials, the majority of arterial and collector roadways included in the Maui 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 816 modeled lane miles on the island (87 percent) are generally operating under uncongested conditions daily. Figure 17 shows the 2007 daily V/C ratios of modeled facilities on the Island of Maui.

TABLE 7
2007 Daily Roadway Performance

Roadway Link Classification	Percentage of 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)	Lane Miles
Principal Arterials	61%	8%	7%	24%	**211**
Minor Arterials	70%	13%	2%	15%	**50**
Collectors	97%	1%	0%	2%	**555**
Total	**87%**	**3%**	**2%**	**8%**	**816**

CH2M HILL, 2012b

Vehicle Trips

Approximately 418,310 daily vehicle trips were generated on the Island of Maui in 2007 as estimated by the travel demand forecasting model. A complete vehicle trip includes one origin and one destination. Approximately 45 percent of all vehicle trips on the island (or 189,090 trips) travel to, from, or completely within the Wailuku-Kahului district. This trip trend is a reflection of Kahului as a major population and employment hub on the island.

As shown in Table 8, most of all daily trips generated within each district are able to complete their trip purpose within the district. In the West Maui district approximately 81 percent of trips generated travel to and from other points within the district, while approximately 75 percent of trips remain within the Wailuku-Kahului district. Compared to other districts, the Paia-Haiku district has the lowest percentage of daily vehicle trips (approximately 39 percent) that remain internal to its district boundaries.

TABLE 8
2007 Daily Vehicle Trips by District

Planning District	Destination						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Total
Hana	2,510	330	140	120	260	760	4,120
Kihei-Makena	330	53,710	2,780	850	4,520	18,920	81,110
Makawao-Pukalani-Kula	140	2,780	25,000	2,930	1,720	12,760	45,330
Paia-Haiku	120	850	2,930	7,320	500	7,150	18,870
West Maui	260	4,520	1,720	500	64,700	8,090	79,790
Wailuku-Kahului	760	18,920	12,760	7,150	8,090	141,410	189,090
Total	4,120	81,110	45,330	18,870	79,790	189,090	418,310

CH2M HILL, 2012b

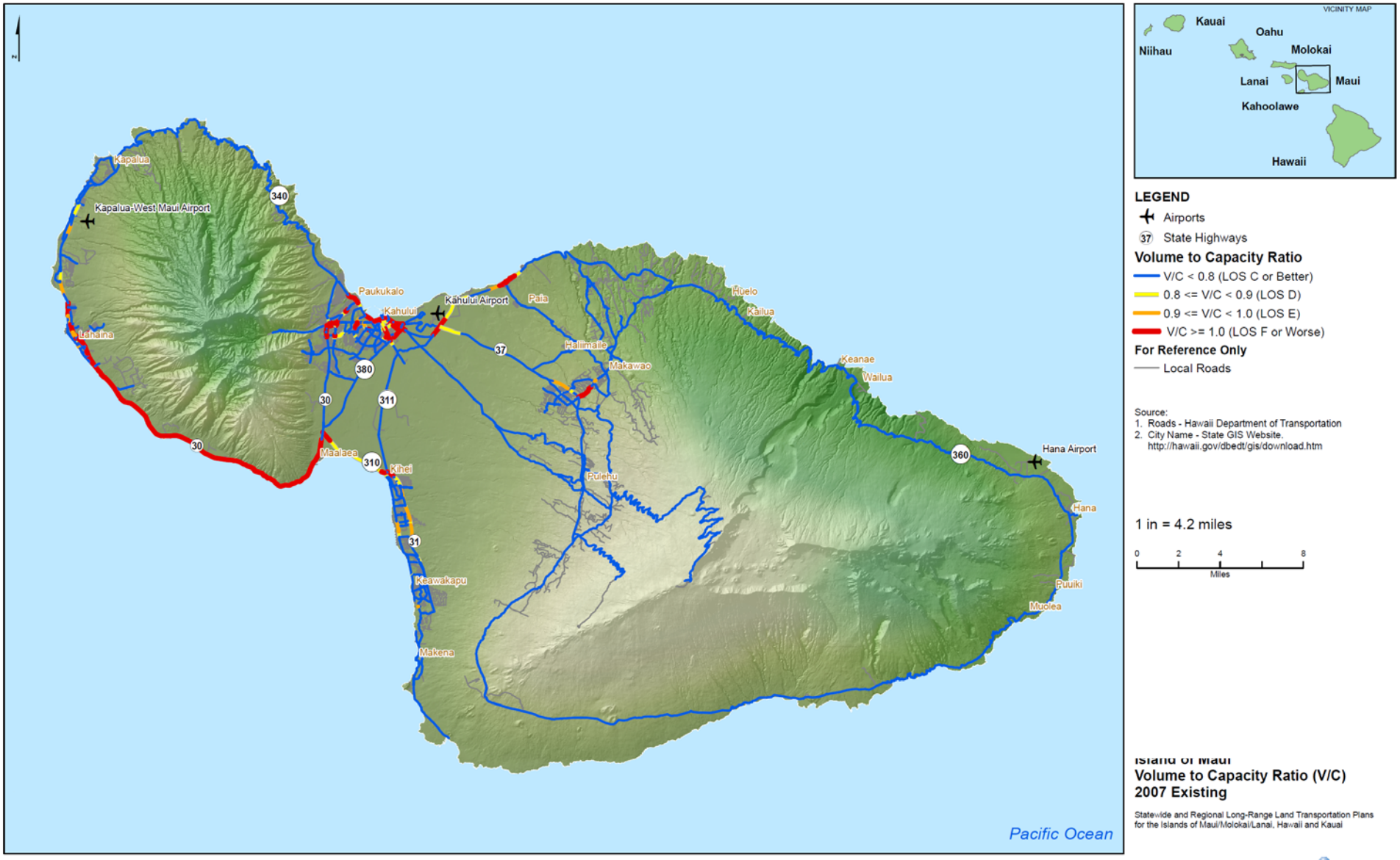


FIGURE 17
Existing Volume-to-Capacity Ratio

The average daily trip length between districts is shown in Table 9. An average trip length between the West Maui district and the Hana district, as estimated by the travel demand forecasting model, is approximately 70 miles. The average length for trips originating in the West Maui district is approximately 9 miles, while the average trip length for trips originating in the Kihei-Makena district and Wailuku-Kahului district is 8 miles and 6 miles, respectively. By contrast, the average length for trips originating from the Hana district is 30 miles. This average trip length is the longest of any district on the island and could be indicative of the relatively isolated nature of the district.

The travel demand forecasting model estimated approximately 2,849,000 daily vehicle miles were traveled in 2007 on the Island of Maui. These daily vehicle miles were traveled by motorized vehicles including automobiles and trucks. During the p.m. peak, an estimated 277,240 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	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Weighted Average
Hana	9	49	39	34	71	47	**30**
Kihei-Makena	49	3	26	22	26	12	**8**
Makawao-Pukalani-Kula	39	26	4	8	44	15	**11**
Paia-Haiku	34	22	8	6	37	13	**11**
West Maui	70	26	44	36	4	25	**9**
Wailuku-Kahului	47	12	15	13	25	3	**6**
Weighted Average	**30**	**8**	**11**	**11**	**9**	**6**	**8**

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Average Trip Time

The overall, island-wide, average trip time per vehicle trip on Maui in 2007 was 17 minutes as estimated by the travel demand forecasting model and shown in Table 10. Trips originating from the Hana district would take an average of 139 minutes to the West Maui district, while the trips to the Wailuku-Kahului district would take an average of 92 minutes.

TABLE 10
2007 Daily Average Vehicle Trip Time between Districts (Minutes)

Planning District	Destination						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Weighted Average
Hana	20	97	80	67	139	92	**60**
Kihei-Makena	97	8	49	42	54	23	**17**
Makawao-Pukalani-Kula	80	49	9	17	88	29	**21**
Paia-Haiku	67	42	17	12	74	28	**23**
West Maui	138	53	87	74	8	51	**18**
Wailuku-Kahului	92	23	29	28	52	7	**13**
Weighted Average	**60**	**17**	**21**	**23**	**18**	**13**	**17**

CH2M HILL, 2012b

A total of 92,930 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, 9,330 vehicle hours (or approximately 10 percent of the daily total) were generated in 2007.

Travel Time

Figure 18 depicts the estimated p.m. peak vehicle travel times from Lahaina to other locations on the island in 2007. From Lahaina, an average vehicle trip to Kahului and Kihei would take between 60 and 75 minutes while trips to Paia would take between 75 and 120 minutes. Trips to Hana would take longer than 120 minutes.

Figure 19 depicts estimated p.m. peak travel times from Kahului in 2007. Trips to Maalaea and Kihei from Kahului would take between 15 and 20 minutes, while trips to Lahaina would take between 30 and 45 minutes. Trips to Hana from Kahului would take between 75 and 120 minutes during the p.m. peak.

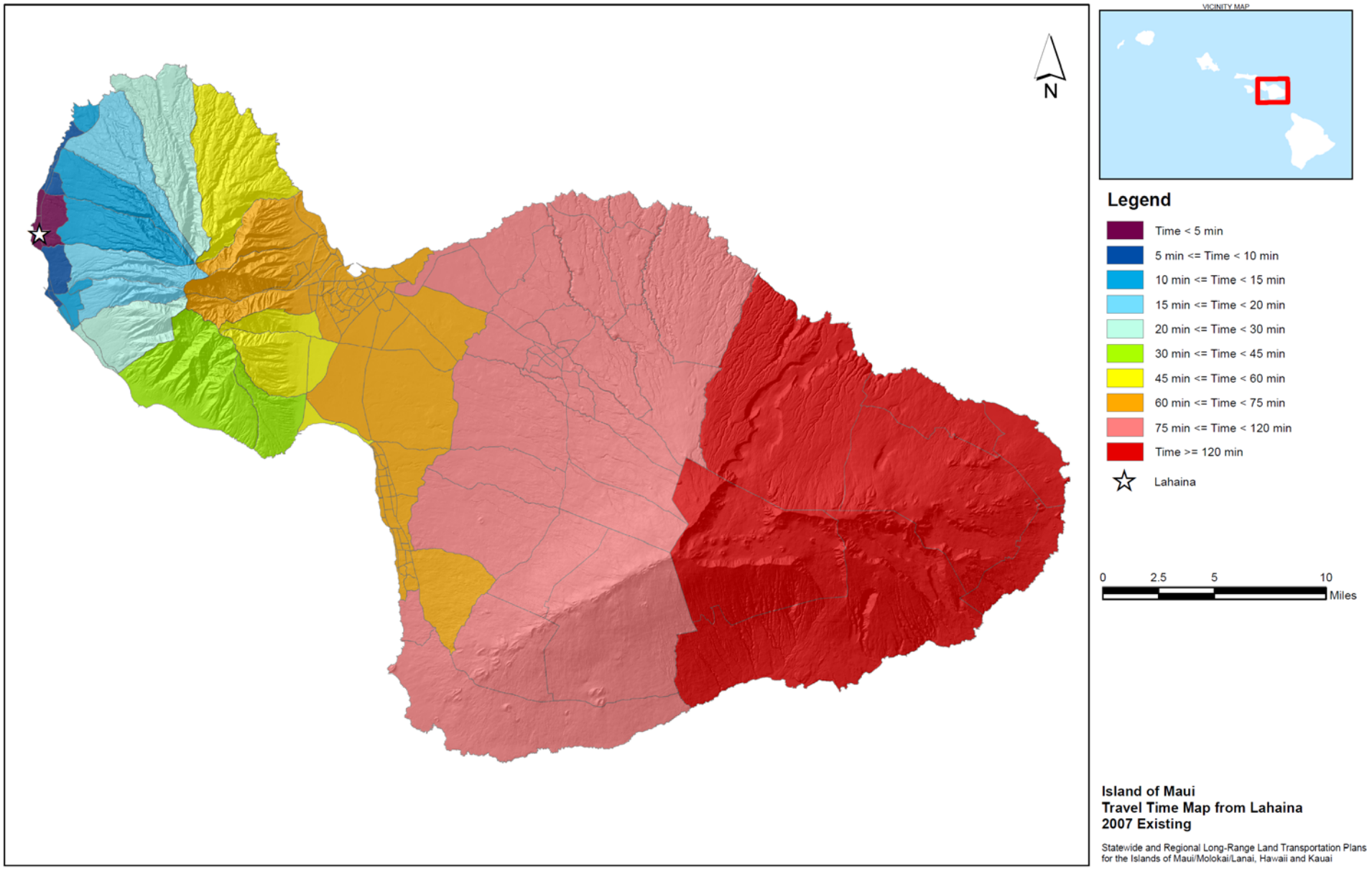


FIGURE 18
Existing Travel Time from Lahaina
CH2M HILL, 2012b

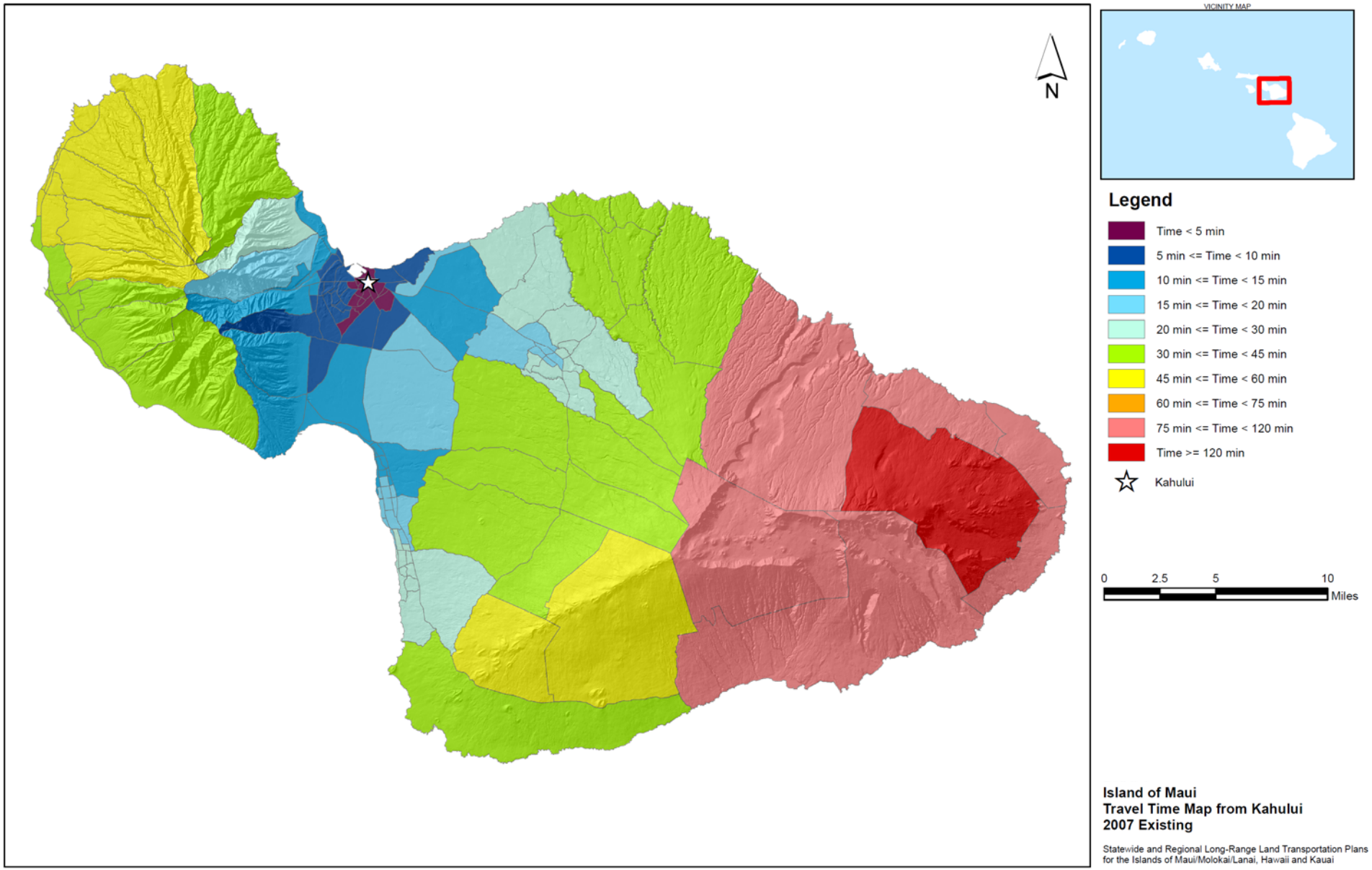


FIGURE 19
Existing Travel Time from Kahului
CH2M HILL, 2012b

Accident Locations

The Highway Safety Improvement Program 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 75 and six or more accidents between 2006 and 2008:

- Honoapiilani Highway (Route 30) MP 31.3-31.6
- Hana Highway (Route 36) MP 6.5-6.8
- Piilani Highway (Route 31) MP 9.6-9.9
- Honoapiilani Highway (Route 30) 17.9-18.2
- Hana Highway (Route 36) MP 8.0-8.3
- Honoapiilani Highway (Route 30) MP 20.2-20.5
- North Kihei Road (Route 310) MP 0.8-1.1
- Dairy Road (Route 380) MP 0.6-0.9
- Puunene Avenue (Route 3500) MP 0.1-0.4
- Honoapiilani Highway (Route 30) MP 12.0-12.3
- Waiehu Beach Road (Route 3400) MP 1.0-1.3
- Honoapiilani Highway (Route 30) MP 19.1-19.4
- Honoapiilani Highway (Route 30) MP 7.8-8.1
- Honoapiilani Highway (Route 30) MP 10.6-10.9
- Kaahumanu Avenue (Route 32) MP 0.8-1.1
- Piilani Highway (Route 31) MP 3.6-3.9
- Mokulele Highway (Route 311) MP 5.9-6.2
- Honoapiilani Highway (Route 30) MP 12.8-13.1
- Honoapiilani Highway (Route 30) MP 17.3-17.6

State intersection locations with nine or more crashes between 2006 and 2008:

- Kuihelani Highway/Maui Lani Parkway
- Haleakala Highway/Makani Road
- Piilani Highway/Kilohana Drive and Mapu Place
- Haleakala Highway/Haliimaile Road
- Haleakala Highway/Kula Highway and Old Haleakala Highway
- Honoapiilani Highway/Kapunakea Street
- Piilani Highway/Keonekai Road
- Piilani Highway/Kaiwahine Street and Uwapo Road
- Honoapiilani Highway/Papalaua Street
- Piilani Highway/Kaonoulu Road
- Piilani Highway/Mokulele Highway & North Kihei Road
- Kahului Beach Road/Kanaloa Avenue
- Honoapiilani Highway/Kaanapali Parkway and Halelo Street
- Honoapiilani Highway/North Kihei Road
- Piilani Highway/Ohukai Road
- Kaahumanu Avenue/Kanaloa Avenue and Mahalani Street
- Honoapiilani Highway/Leialii Parkway

- Puunene Avenue/Dairy Road and Kuihelani Highway
- Hana Highway/Dairy Road
- Kaahumanu Avenue/Kahului Beach Road and Kane Street

County intersection locations (that are part of the federal-aid highways system) with five or more crashes between 2006 and 2008:

- Hina Avenue/Kamehameha Avenue
- South Kihei Road/Alanui Ke Alii Drive
- Papa Avenue/Lono Avenue
- Kamehameha Avenue/Lono Avenue
- South Kihei Road/Lipoa Street
- South Kihei Road/East Welakahao Road and West Welakahao Road
- Wakea Avenue/Lono Avenue
- South Kihei Road/Halelani Place
- South Kihei Road/Keonekai Road
- South Kihei Road/Waimahaihai Road
- Papa Avenue/Hina Avenue
- Papa Avenue/Kamehameha Avenue

State locations with two or more pedestrian-related crashes between 2006 and 2008:

- High Street at Main Street MP 0.0
- Honoapiilani Highway at Keanu Street MP 0.5
- Honoapiilani Highway at Papalaua Street MP 21.1
- Hana Highway at Baldwin Avenue MP 6.7

County locations (that are part of the federal-aid highways system) with two or more pedestrian-related crashes between 2006 and 2008:

- South Kihei Road at Keonekai Road MP 31.0

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 *Statewide Transportation Improvement Program: Revision #3 FFY 2011 Through 2014* (HDOT, 2011). For the purpose of the future baseline Maui 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
West Maui			
Lahaina Bypass	Hokiokio Place to Keawe Street	Construct new two-lane roadway.	Phase 1A constructed, Phase 1B-1 estimated 2012 construction completion
Honoapiilani Highway (Route 30)	Lahainaluna Road (Route 3040) to Aholo Road	Widen to a four-lane divided highway with noise walls and sidewalks.	Constructed
Wailuku-Kahului			
Hana Highway	In Kahului, from Kaahumanu Ave to Dairy Rd	Widen from four to six lanes from Kaahumanu Avenue to Dairy Road.	2014-2015 Construction Funding
Kahului Airport Access Road (Route 3800)	Puunene Avenue to Hana Highway	Construct a portion of the new access road to Kahului Airport, includes landscaping, drainage, highway lighting, utilities, and other miscellaneous improvements.	2011 Right-of-Way 2013- 2015 Construction Funding
Kuihelani Highway	Puunene Avenue to Hana Highway	New four-lane access road to Hana Highway to provide bypass to Dairy Road.	2014 Construction Funding
Puunene Avenue (Route 3500)	Kaahumanu Avenue (Route 32) to Kamehameha Avenue (Route 3940)	Install two-way left-turn lanes on Puunene Avenue.	2011 Construction Funding
Puunene Avenue (Route 3500)	Kamehameha Avenue (Route 3940) to Kuihelani Highway (Route 380)	Widen from two to four lanes	2011 Right-of-Way 2014-2015 Construction Funding

Forecast Socioeconomic Conditions

The aggregate land use and socioeconomic forecast data were developed by DBEDT (2008). These data include forecasts of population, employment, and visitor's for each county in the State of Hawaii. Maui 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. Maui 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 on Maui by district. On Maui, population is expected to grow by 19 percent by 2020 and 43 percent overall by 2035. The majority of this growth would occur in the Kihei-Makena and Wailuku-Kahului districts. Compared to 2007, the population in Kihei-Makena is expected to grow by approximately 35 percent by the year 2020, and by 70 percent by 2035. By 2035, the West Maui district is expected to grow by approximately 16,530 residents, which is the largest percentage increase on the island at 81 percent. The Hana and Paia-Haiku districts are expected to have the lowest percentage of population growth on the island.

Population growth on Molokai and Lanai is expected to be nominal.

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
Molokai	7,350	7,350	7,350	0	0%	0	0%
Lanai	3,140	3,140	3,140	0	0%	0	0%
Hana	2,170	2,260	2,780	90	4%	610	28%
Kihei-Makena	28,310	38,150	48,020	9,840	35%	19,710	70%
Makawao- Pukalani-Kula	20,240	26,390	26,440	6,150	30%	6,200	31%
Paia-Haiku	12,580	13,730	13,620	1,150	9%	1,040	8%
Wailuku-Kahului	51,410	56,770	69,490	5,360	10%	18,080	35%
West Maui	20,490	25,810	37,020	5,320	26%	16,530	81%
Total	**145,690**	**173,600**	**207,860**	**27,910**	**19%**	**62,170**	**43%**

CH2M HILL, 2012a
(Population based on forecasts from the State of Hawaii Department of Business, Economic Development and Tourism. Allocations based on data provided by Maui County).

Households

Table 13 summarizes the household growth within Maui County by districts. The total number of households on the island is expected to increase by 22 percent by 2020 and by 53 percent by 2035. The Wailuku-Kahului and West Maui districts would experience the highest percentage of household growth compared to all other districts. By 2020, the number of households in the Wailuku-Kahului district would increase by 34 percent compared to existing 2007 conditions. By 2035, households would increase by over 70 percent. Households in the West Maui district would nearly double by 2035.

The number of households on Molokai and Lanai are not expected to increase compared to existing conditions. Figures 20 and 21 illustrate the number of households throughout the Island of Maui for Year 2020 and 2035, respectively.

TABLE 13
Forecast Households

	Households			Households Change (Year 2007 to Year 2020)		Households Change (Year 2007 to Year 2035)	
Planning District	**2007**	**2020**	**2035**	**Difference**	**% Difference**	**Difference**	**% Difference**
Molokai	2,580	2,580	2,580	0	0%	0	0%
Lanai	1,160	1,160	1,160	0	0%	0	0%
Hana	750	810	1,040	60	8%	290	39%
Kihei-Makena	10,690	13,720	18,030	3,030	28%	7,340	69%
Makawao- Pukalani-Kula	8,600	9,490	9,930	890	10%	1,330	15%
Paia-Haiku	4,840	4,940	5,110	100	2%	270	6%
Wailuku-Kahului	15,270	20,420	26,090	5,150	34%	10,820	71%
West Maui	7,060	9,290	13,900	2,230	32%	6,840	97%
Total	**50,950**	**62,410**	**77,840**	**11,460**	**22%**	**26,890**	**53%**

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 Maui County by districts. The Wailuku-Kahului district is expected to support half of the island's job opportunities in the future and will remain the islands' primary employment center. Compared to 2007 conditions, approximately 12,450 additional jobs are expected by 2020 (an increase of 38 percent), and 22,660 additional employment opportunities are expected by 2035 (an increase of 69 percent) in the Wailuku-Kahului area. Paia-Haiku and Kihei-Makena districts are also expected to see significant increases in employment in the future.

Figures 22 and 23 illustrate the number of employment throughout the Island of Maui 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
Molokai	2,350	2,350	2,350	0	0%	0	0%
Lanai	1,700	1,700	1,700	0	0%	0	0%
Hana	550	620	680	70	13%	130	24%
Kihei-Makena	13,450	16,810	19,150	3,360	25%	5,700	42%
Makawao- Pukalani-Kula	4,850	5,680	6,200	830	17%	1,350	28%
Paia-Haiku	1,490	1,830	2,300	340	23%	810	54%
Wailuku-Kahului	32,840	45,290	55,500	12,450	38%	22,660	69%
West Maui	16,520	17,050	18,200	530	3%	1,680	10%
Total	**73,750**	**91,330**	**106,080**	**17,580**	**24%**	**32,330**	**44%**

CH2M HILL, 2012a
(Employment based on forecasts from the State of Hawaii Department of Business, Economic Development and Tourism. Allocations based on data provided by Maui County).

Visitor Industry

The Island of Maui airports are forecast to accommodate, approximately 6.9 million passengers in Year 2020 and 7.6 million passengers in Year 2035 (CH2M HILL, 2012b). This forecast equates to an approximate 3.8 percent increase of passengers by Year 2020, and 14.5 percent increase by Year 2035.

Kahului Harbor is forecast to accommodate, approximately 516,000 cruise ship passengers in Year 2020 and 581,000 passengers in Year 2035 (CH2M HILL, 2012b). This forecast equates to an approximate 3.8 percent increase of passengers by Year 2020, and 14.5 percent increase by Year 2035.

By Year 2020, the forecast estimates approximately 19,500 visitor accommodations on the Island of Maui, a growth of approximately 1.6 percent. By Year 2035, approximately 21,800 visitor accommodations are projected, resulting in an 11.8 percent growth. (CH2M HILL, 2012b)

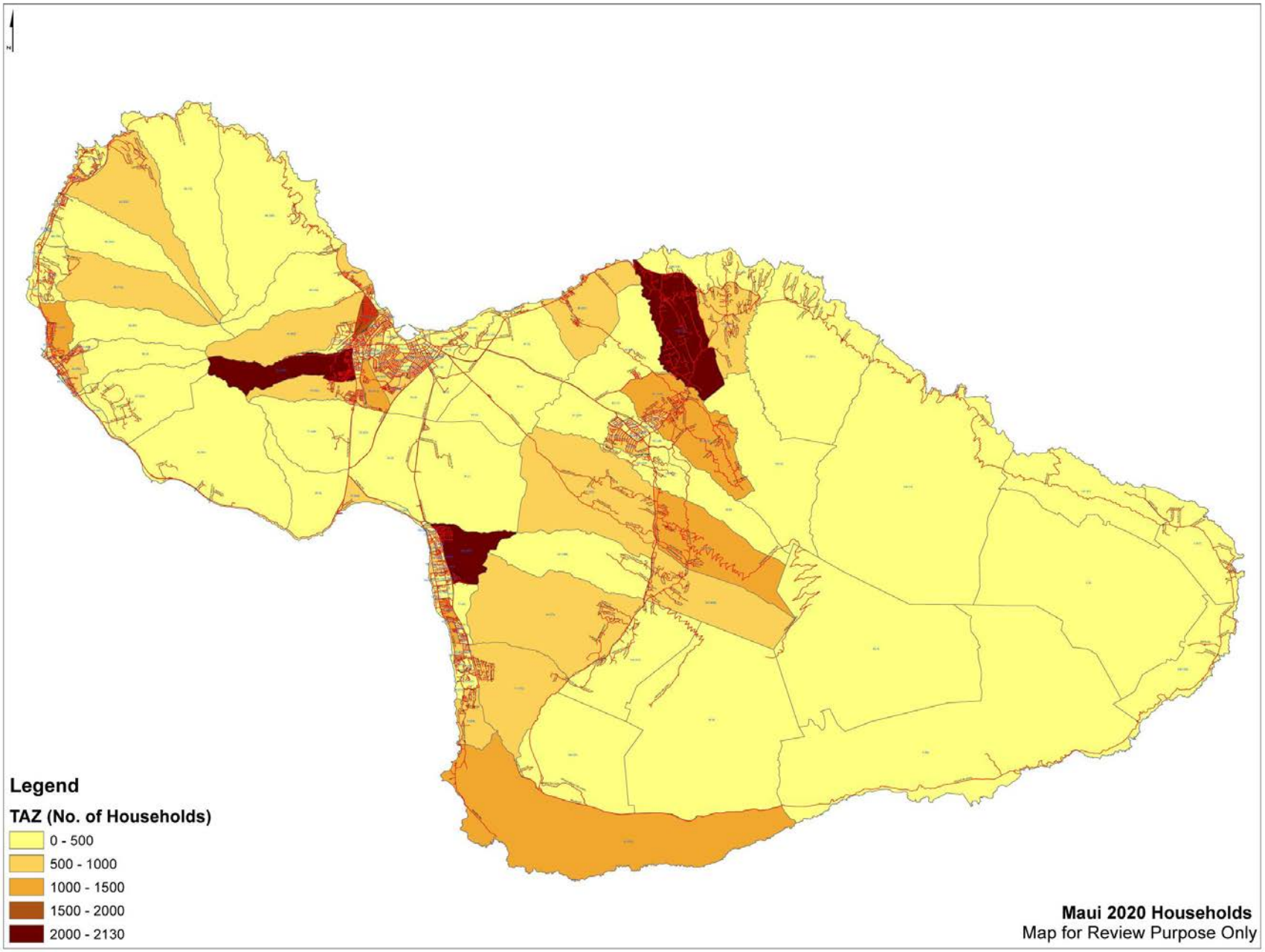


FIGURE 20
Year 2020 Households

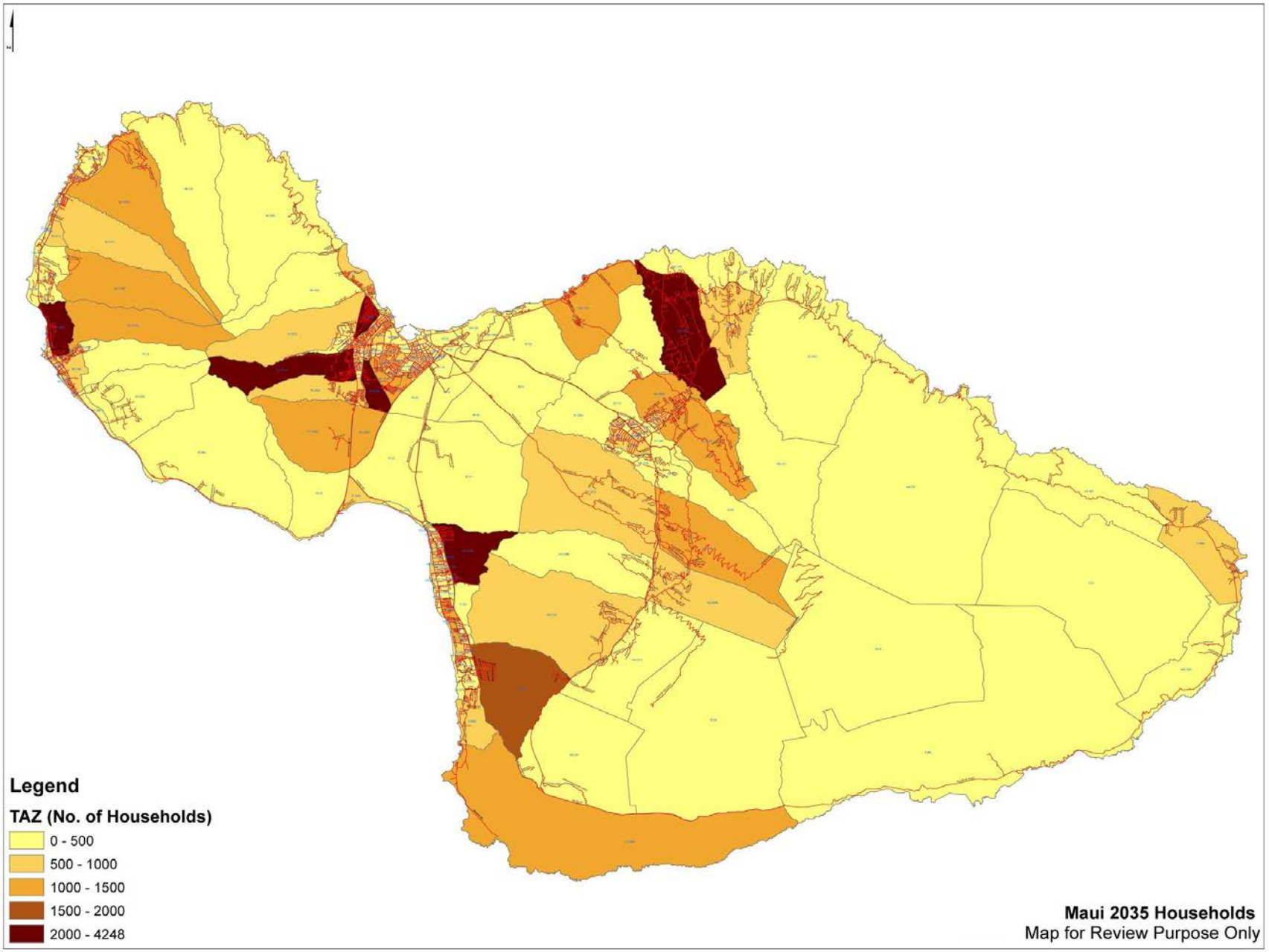


FIGURE 21
Year 2035 Households

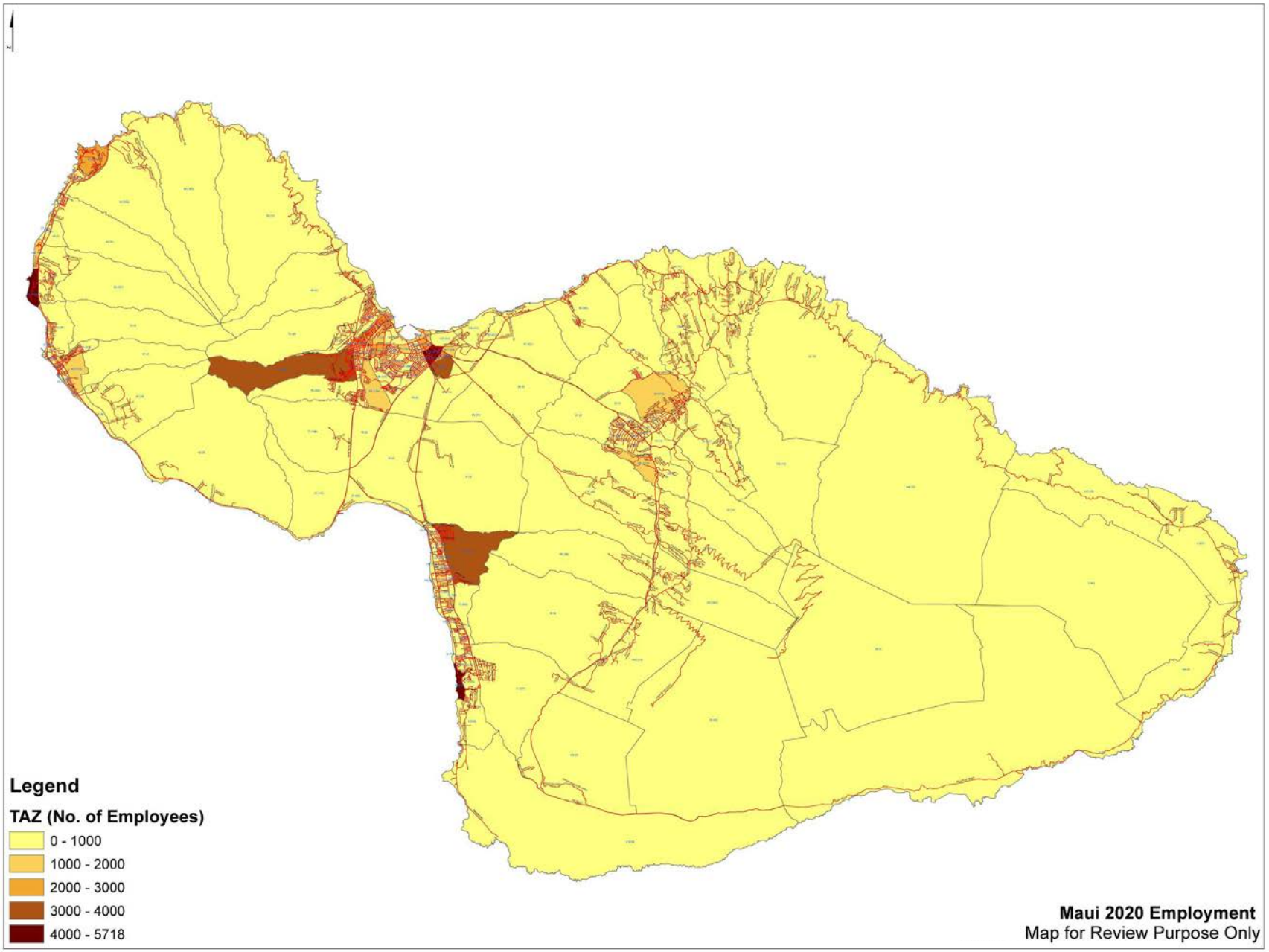


FIGURE 22
Year 2020 Employment

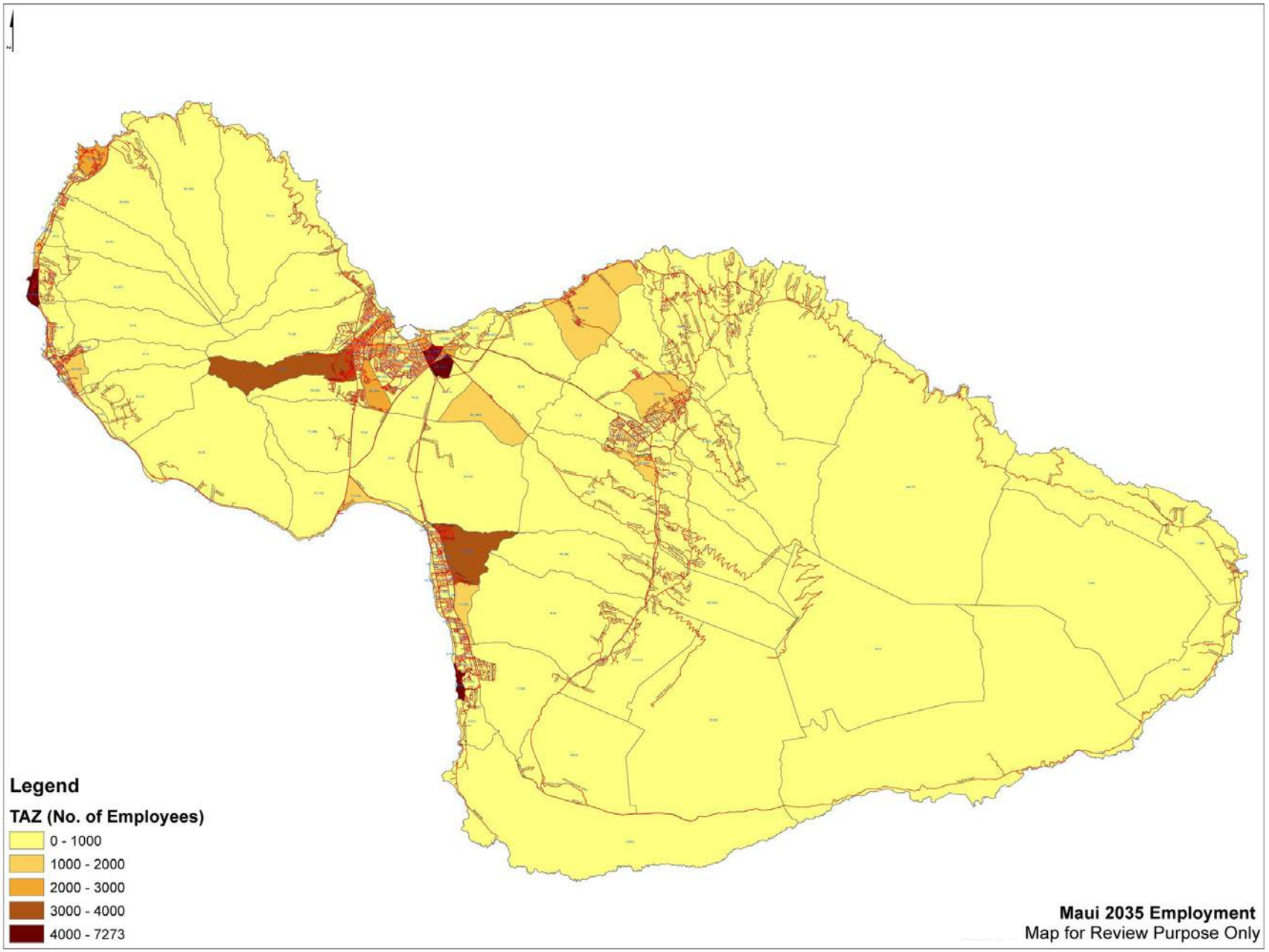


FIGURE 23
Year 2035 Employment

Airport and Harbor Cargo

The Island of Maui airports are forecast to accommodate, approximately 35,900 tons of cargo in Year 2020 and 43,000 tons in Year 2035 (CH2M HILL, 2012b). This forecast equates to an approximate 7.5 percent increase of air cargo by Year 2020, and 22.8 percent increase by Year 2035.

Kahului Harbor is forecast to accommodate approximately 3.4 million tons of cargo in Year 2020, which equates to an approximate 7.5 percent increase. By Year 2035, the harbor is forecast to accommodate roughly 4.1 million tons, which is approximately an increase of 22.8 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

South of Kahului, average daily traffic volumes on Mokulele Highway increase by approximately 33 percent by 2020, from 33,600 vehicles per day in both directions in 2007 to 44,700 vehicles per day. By 2035, the forecast number of vehicles per day would increase to 61,700, or nearly 84 percent greater than existing conditions. On Honoapiilani Highway near Maalaea, 39,800 daily vehicles are forecast in 2020. This represents an increase of approximately 14 percent over 2007 daily volumes. Further west, forecast traffic volumes increase slightly to 33,500 vehicles per day near Lahaina and 47,600 vehicles per day approaching Kaanapali in 2020. In 2035, approximately 36,800 average daily vehicles are forecast near Lahaina and 50,900 vehicles are expected near Kaanapali.

On the Hana Highway east of Kahului, the forecast average daily traffic volumes peak at approximately 22,200 daily vehicles in 2020 and 23,200 daily vehicles in 2035, representing an increase of 6 and 10 percent over existing conditions, respectively. Daily traffic volume in both directions of Hana Highway decrease gradually further east near Haiku.

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 Maui roadway network in 2020 and in 2035. In 2007, 8 percent of the modeled network experiences V/C ratios of 1.0 or more (LOS F). This trend worsens to 12 percent of the network in 2020 and 22 percent in 2035. Similar to 2007 conditions, most of the LOS F facilities are links classified as principal arterials with 34 percent of all principal arterial lane miles at LOS F in 2020, and 61 percent at LOS F in 2035.

The majority of arterial and collector roadways on Maui 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 829 modeled lane miles on the island would generally operate under uncongested conditions daily.

Figure 24 shows the 2020 forecast daily V/C ratios of modeled facilities on the Island of Maui. In 2020, portions of Honoapiilani Highway between Lahaina and Kapalua are expected to worsen from LOS C or better in 2007 to LOS E or F. Multiple roads within Kahului are also expected to worsen to LOS E or F due to increases in traffic. Multiple sections of North Kihei Road and Piilani Highway between Maalaea and Keawakapu would be expected to worsen from LOS D or better to LOS E and LOS F in 2020.

Figure 25 shows the 2035 forecast V/C ratios. In 2035, Mokulele Highway and Honoapiilani Highway south of Kahului would worsen and operate at LOS F, compared to LOS C or better in both existing and 2020 conditions. Forecast growth in population and households in the Wailuku-Kahului area contribute to increased traffic and congestion conditions.

TABLE 15
2020 Daily Roadway Performance

Roadway Link Classification	Percentage of Lane Miles (2020)				
	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)	Lane Miles
Principal Arterials	44%	10%	12%	34%	**216**
Minor Arterials	63%	9%	4%	24%	**55**
Collectors	95%	2%	1%	2%	**558**
Total	**80%**	**4%**	**4%**	**12%**	**829**

CH2M HILL, 2012b

TABLE 16
2035 Daily Roadway Performance

Roadway Link Classification	Percentage of Lane Miles (2035)				
	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)	Lane Miles
Principal Arterials	24%	10%	5%	61%	**216**
Minor Arterials	58%	3%	11%	28%	**55**
Collectors	90%	3%	2%	5%	**558**
Total	**70%**	**5%**	**3%**	**22%**	**829**

CH2M HILL, 2012b

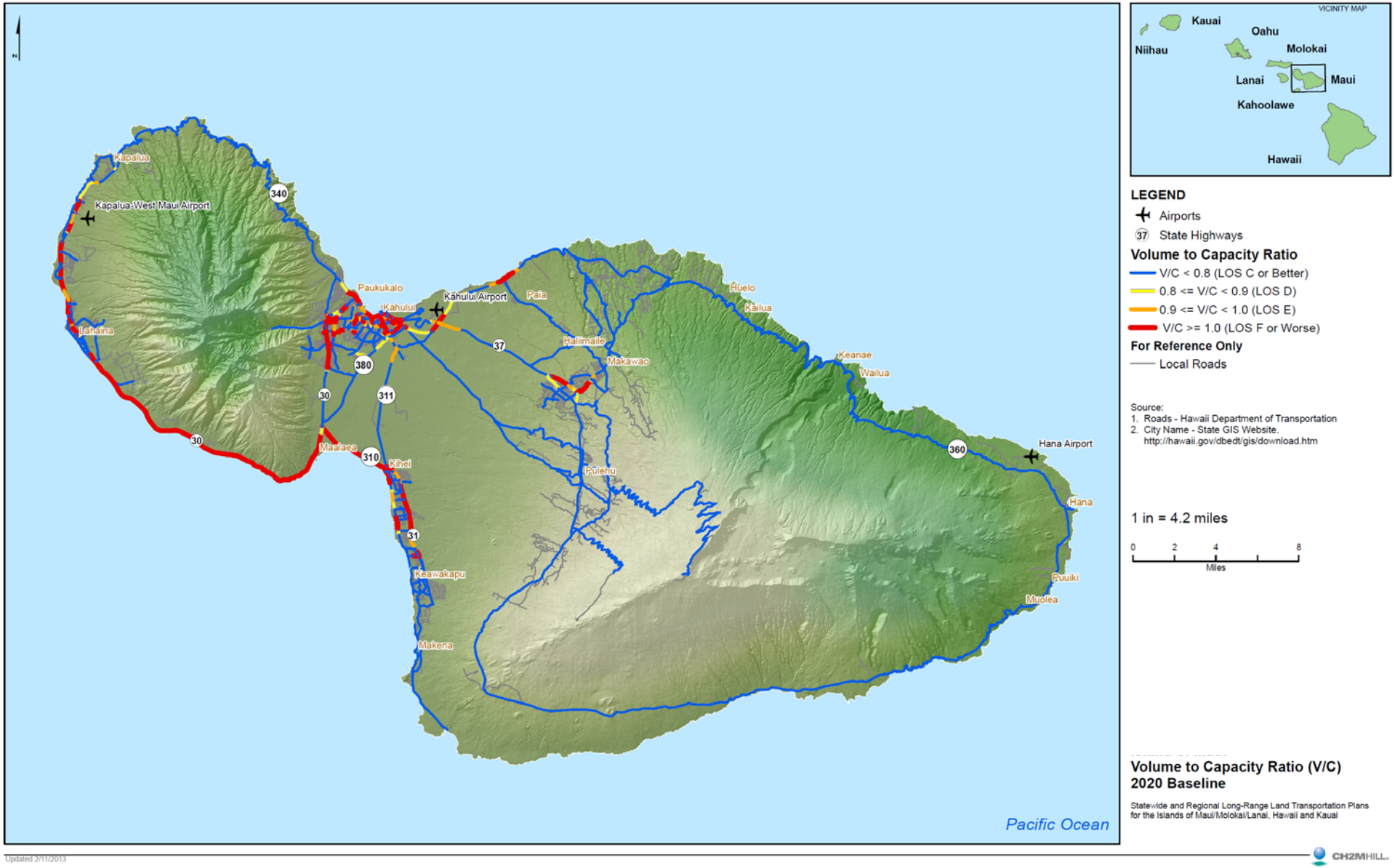


FIGURE 24
Year 2020 Volume-to-Capacity Ratio

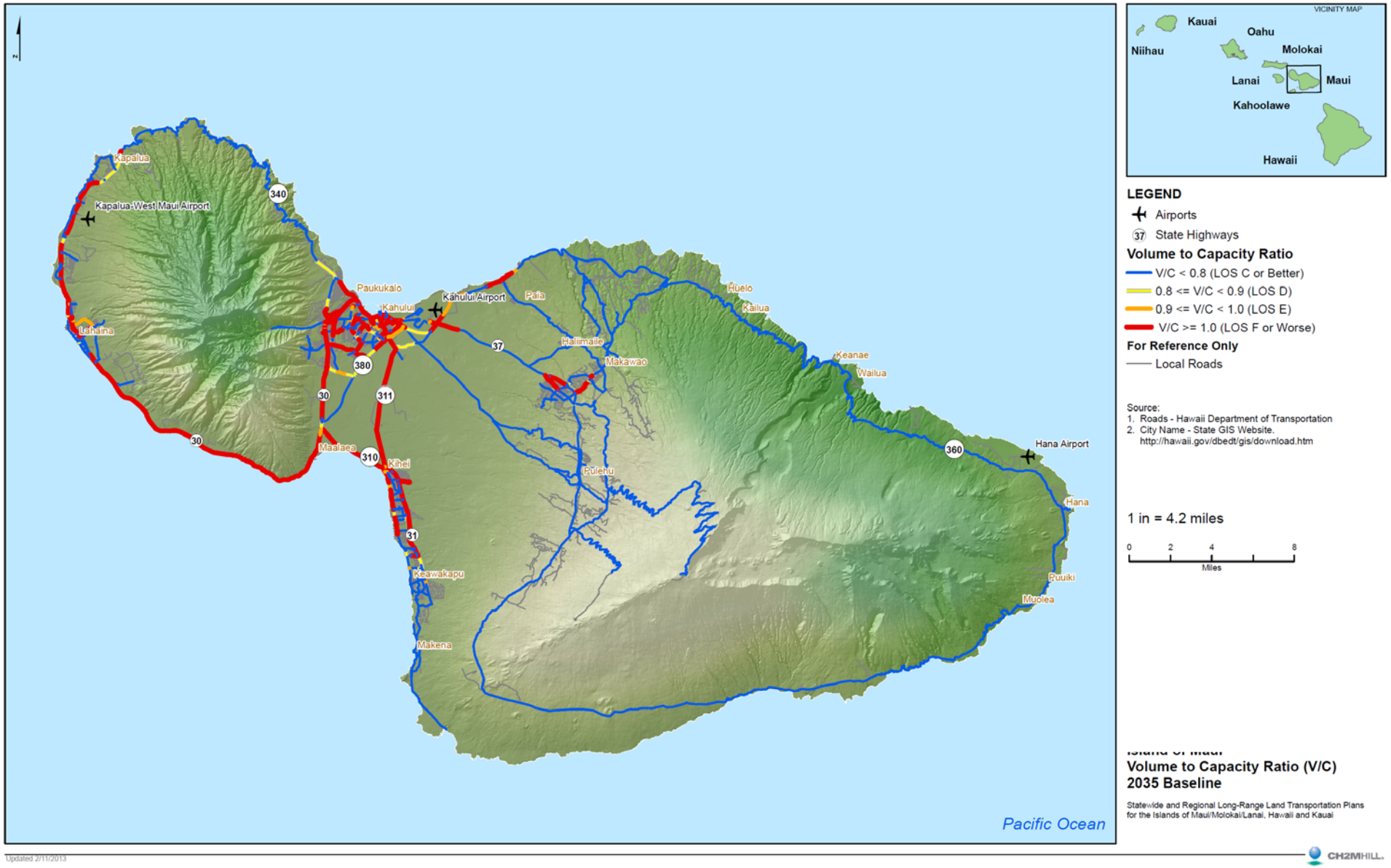


FIGURE 25
Year 2035 Volume-to-Capacity Ratio

Vehicle Trips

As shown in Tables 17 and 18, the total vehicle trips generated on Maui increase from 418,310 trips in 2007 to 523,370 trips in 2020 and 636,430 trips in 2035. Compared to 2007, overall vehicle trips are expected to increase by approximately 25 percent in 2020 and by approximately 52 percent in 2035. The Paia-Haiku district experiences modest growth compared to 2007 in total vehicle trips: 6 percent growth in 2020 and 17 percent growth in 2035. The Wailuku-Kahului district would experience the most significant growth from 189,090 total vehicle trips in 2007 to 245,000 trips in 2020 and 299,100 trips in 2035, which are growth rates of 30 percent and 58 percent, respectively.

Approximately 47 percent of trips generated in 2020 and in 2035 would travel to, from, or within the Wailuku-Kahului 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)						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Total
Hana	2,870	390	160	150	320	920	**4,810**
Kihei-Makena	390	68,210	3,450	960	4,860	25,980	**103,850**
Makawao-Pukalani-Kula	160	3,450	28,090	3,080	1,670	14,980	**51,430**
Paia-Haiku	150	960	3,080	7,620	380	7,770	**19,960**
West Maui	320	4,860	1,670	380	81,310	9,780	**98,320**
Wailuku-Kahului	920	25,980	14,980	7,770	9,780	185,570	**245,000**
Total	**4,810**	**103,850**	**51,430**	**19,960**	**98,320**	**245,000**	**523,370**

CH2M HILL, 2012b

TABLE 18
2035 Daily Vehicle Trips by District

Planning District	Destination (2035)						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Total
Hana	3,620	450	200	210	330	1,070	**5,880**
Kihei-Makena	450	82,370	4,080	1,120	6,160	36,060	**130,240**
Makawao-Pukalani-Kula	200	4,080	31,260	3,420	1,650	16,070	**56,680**
Paia-Haiku	210	1,120	3,420	8,510	380	8,390	**22,030**
West Maui	330	6,160	1,650	380	100,050	13,930	**122,500**
Wailuku-Kahului	1,070	36,060	16,070	8,390	13,930	223,580	**299,100**
Total	**5,880**	**130,240**	**56,680**	**22,030**	**122,500**	**299,100**	**636,430**

CH2M HILL, 2012b

The future average daily trip length between districts is shown in Tables 19 and 20. In 2020 and 2035, the average trip length between districts is expected to remain very similar to existing conditions. An average trip length between the West Maui district and the Hana district in 2020 and in 2035 would be approximately 70 miles. The average length for all trips originating from the Kihei-Makena district is 8 miles and from the Wailuku-Kahului district is approximately 6 miles in both 2020 and 2035.

Average trip lengths from the Hana district and from the Makawao-Pukalani-Kula district would be almost identical in length compared to existing trip lengths at approximately 30 miles and 11 miles, respectively.

TABLE 19
2020 Daily Average Vehicle Trip Length between Districts (Miles)

Planning District	Destination (2020)						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Weighted Average
Hana	9	49	41	35	70	47	**31**
Kihei-Makena	49	3	25	22	26	12	**8**
Makawao-Pukalani-Kula	41	25	4	8	47	15	**11**
Paia-Haiku	35	22	8	6	37	13	**11**
West Maui	70	26	47	37	4	25	**8**
Wailuku-Kahului	47	12	15	13	25	3	**6**
Weighted Average	**31**	**8**	**11**	**11**	**8**	**6**	**8**

CH2M HILL, 2012b

TABLE 20
2035 Daily Average Vehicle Trip Length between Districts (Miles)

Planning District	Destination (2035)						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Weighted Average
Hana	9	49	41	37	71	48	**32**
Kihei-Makena	49	4	24	21	27	12	**8**
Makawao-Pukalani-Kula	41	24	5	8	49	15	**11**
Paia-Haiku	37	21	8	6	37	13	**11**
West Maui	71	26	49	37	4	27	**9**
Wailuku-Kahului	48	11	15	13	26	3	**6**
Weighted Average	**32**	**8**	**11**	**11**	**9**	**6**	**8**

CH2M HILL, 2012b

The forecast daily vehicle miles traveled increases from 2,849,000 vehicle miles in 2007 to 3,438,800 vehicle miles in 2020 on the Island of Maui. This equates to a 21 percent increase overall. In 2035, approximately 4,289,000 vehicle miles will be traveled island-wide, for an

increase of approximately 51 percent between 2007 and 2035. Approximately 10 percent of the daily vehicle miles traveled would occur during the p.m. peak hour.

Average Trip Time

As shown in Tables 21 and 22, the overall, island-wide, average trip time per vehicle trip would rise from 17 minutes in 2007 to 22 minutes in 2035 (29 percent increase). Island-wide trip time per vehicle in 2020 would remain the same as existing (17 minutes on average). This increase in 2035 average trip time is likely attributed to increased trips associated with the Kihei-Makena and Wailuku-Kahului districts. Trip times from the Wailuku-Kahului district would increase from 13 minutes in 2007 to 19 minutes in 2035 (an increase of 40 percent). From the Hana district, trip times would increase by 15 percent, from 60 minutes in 2007 to 69 minutes in 2035.

TABLE 21
2020 Daily Average Vehicle Trip Time between Districts (Minutes)

Planning District	Destination (2020)						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Weighted Average
Hana	20	99	85	69	144	93	**64**
Kihei-Makena	99	8	48	44	62	24	**17**
Makawao-Pukalani-Kula	85	48	10	17	101	28	**22**
Paia-Haiku	68	44	17	13	79	28	**23**
West Maui	145	63	102	81	9	59	**20**
Wailuku-Kahului	93	24	29	28	57	8	**14**
Weighted Average	**64**	**17**	**22**	**23**	**19**	**14**	**17**

CH2M HILL, 2012b

TABLE 22
2035 Daily Average Vehicle Trip Time between Districts (Minutes)

Planning District	Destination (2035)						
Origin	Hana	Kihei-Makena	Makawao-Pukalani-Kula	Paia-Haiku	West Maui	Wailuku-Kahului	Weighted Average
Hana	20	106	85	70	168	97	**69**
Kihei-Makena	107	11	54	51	86	32	**23**
Makawao-Pukalani-Kula	85	54	10	18	126	31	**24**
Paia-Haiku	70	50	18	13	103	31	**25**
West Maui	170	88	128	106	11	83	**26**
Wailuku-Kahului	98	32	32	32	81	11	**19**
Weighted Average	**70**	**23**	**24**	**25**	**25**	**19**	**22**

CH2M HILL, 2012b

Daily vehicle hours traveled in 2020 and 2035 would increase at a faster rate than vehicle miles traveled in the future baseline years. A total of 119,730 daily vehicle hours of travel were estimated in 2020, which is approximately 29 percent greater than 2007 conditions. In 2035, 191,240 daily vehicle hours would be spent by automobiles and trucks on Maui's arterials or collectors. This represents a 106 percent increase over 2007 daily vehicle hours.

Travel Time

Figures 26 through 29 depict the estimated p.m. peak vehicle travel times from Lahaina and Kahului to locations within the planning districts in 2020 and 2035. In 2020, travel times from Lahaina to other districts would generally be similar to existing travel times. By 2035, trips to areas of Wailuku and Kahului would be slightly longer (between 75 and 120 minutes) than 2007 conditions (between 60 and 75 minutes). Trips to Kihei and Wailea would also increase and take between 75 and 120 minutes, while the same trip would take between 60 and 75 minutes in 2007.

From Kahului, p.m. peak hour travel times to Kapalua would increase from between 45 and 60 minutes in existing conditions to between 60 and 75 minutes in 2020. Travel times to Maalaea and to portions of Kihei would also increase by up to 15 minutes in 2020. By 2035, travel times from Kahului to West Maui would increase to between 75 and 120 minutes (from between 45 and 60 minutes in 2007). Trips to Wailea would take between 30 and 45 minutes (existing trips take less than 30 minutes), while an average vehicle trip to Maalaea would take between 30 and 45 minutes (existing trips take less than 15 minutes).

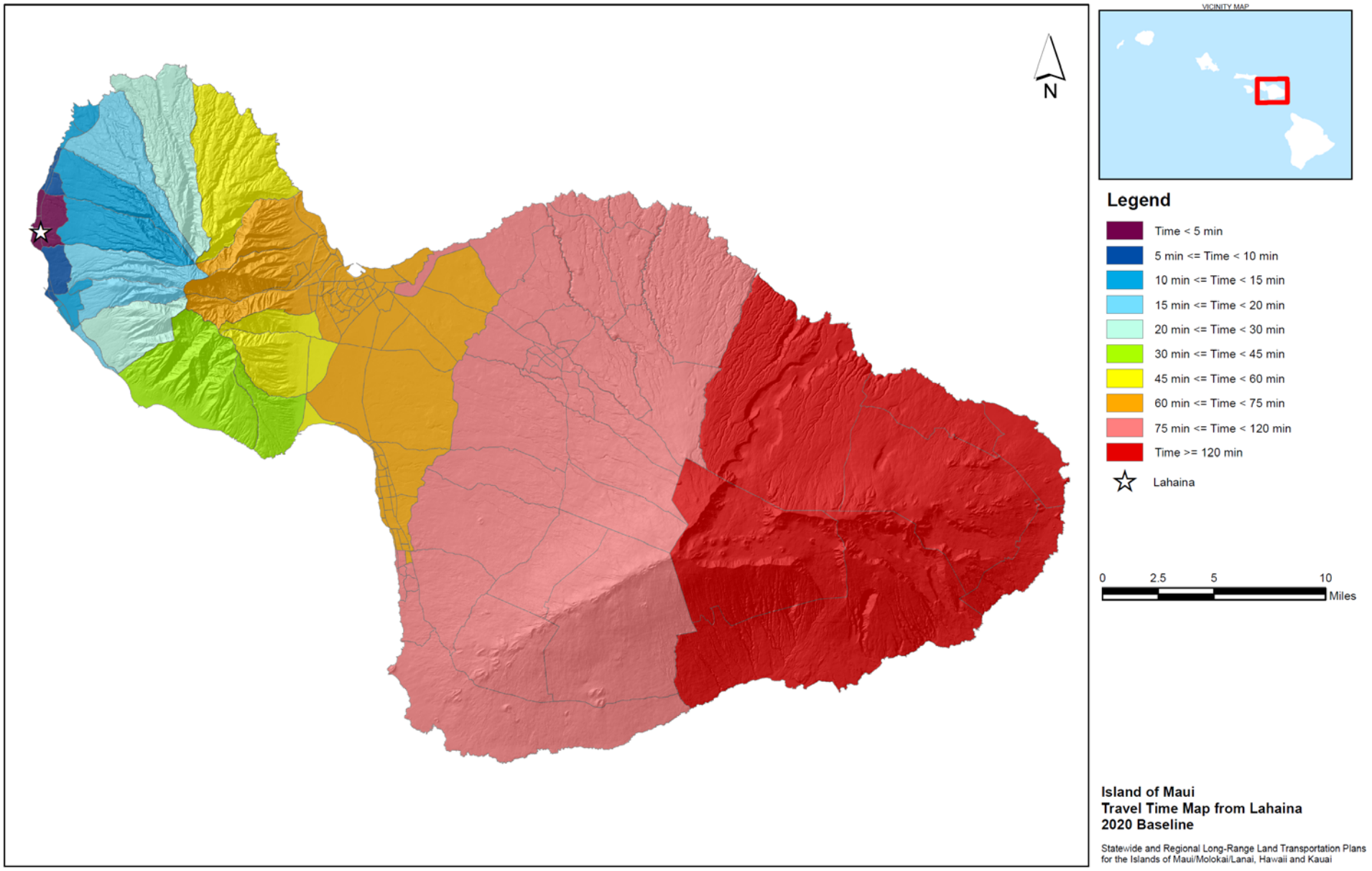


FIGURE 26
2020 Travel Time from Lahaina
CH2M HILL, 2012b

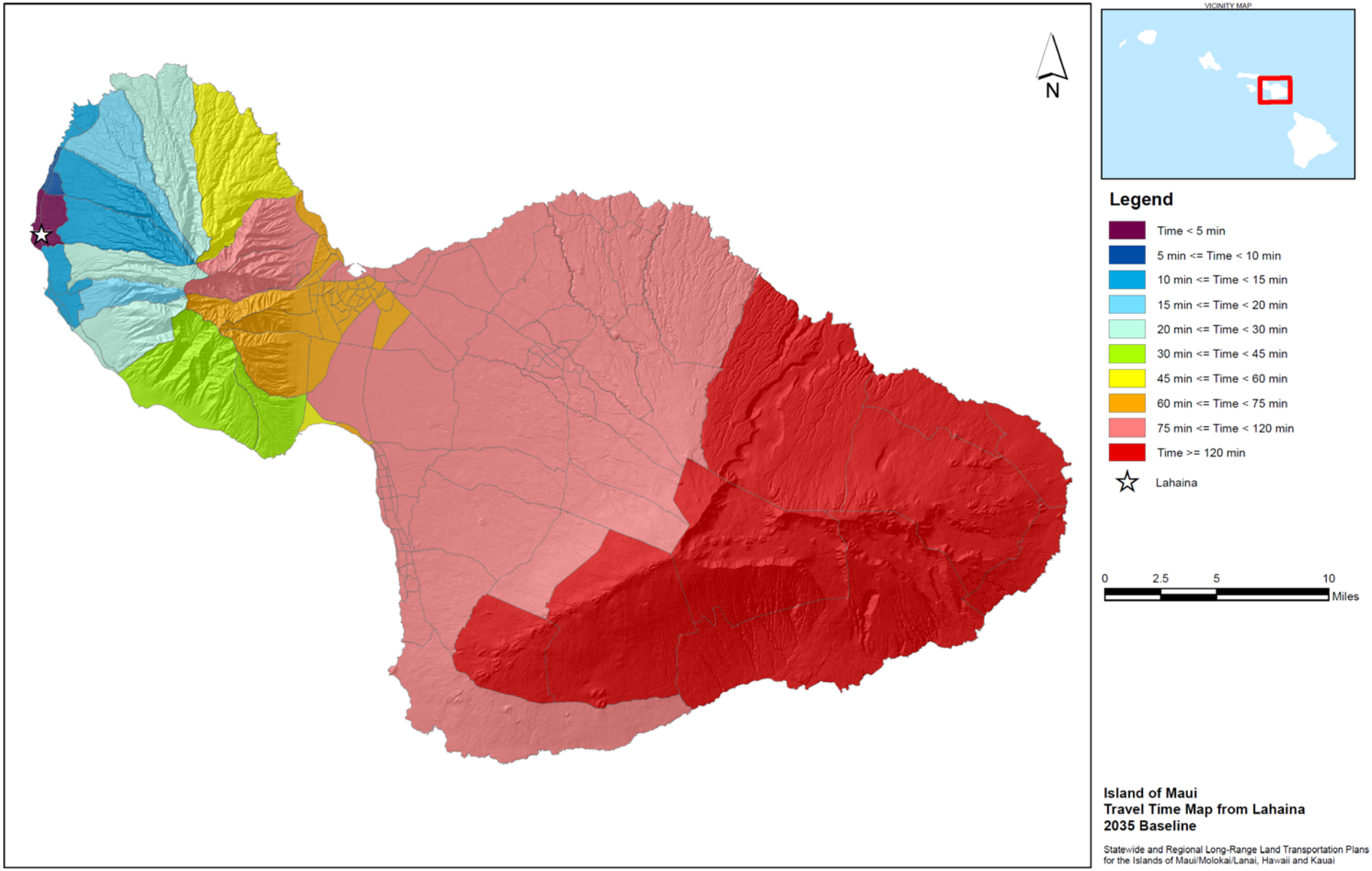


FIGURE 27
2035 Travel Time from Lahaina
CH2M HILL, 2012b

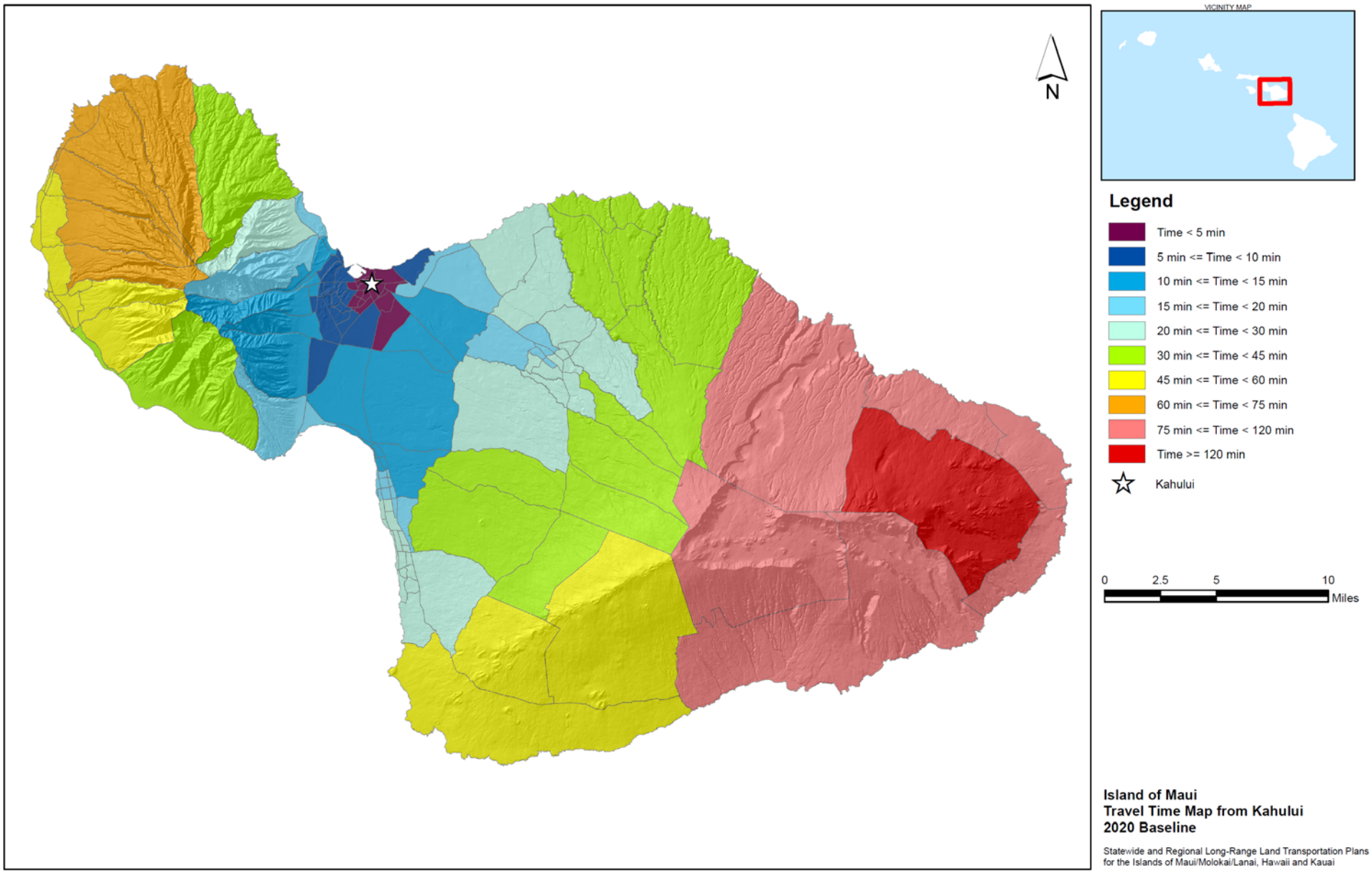


FIGURE 28
2020 Travel Time from Kahului
CH2M HILL, 2012b

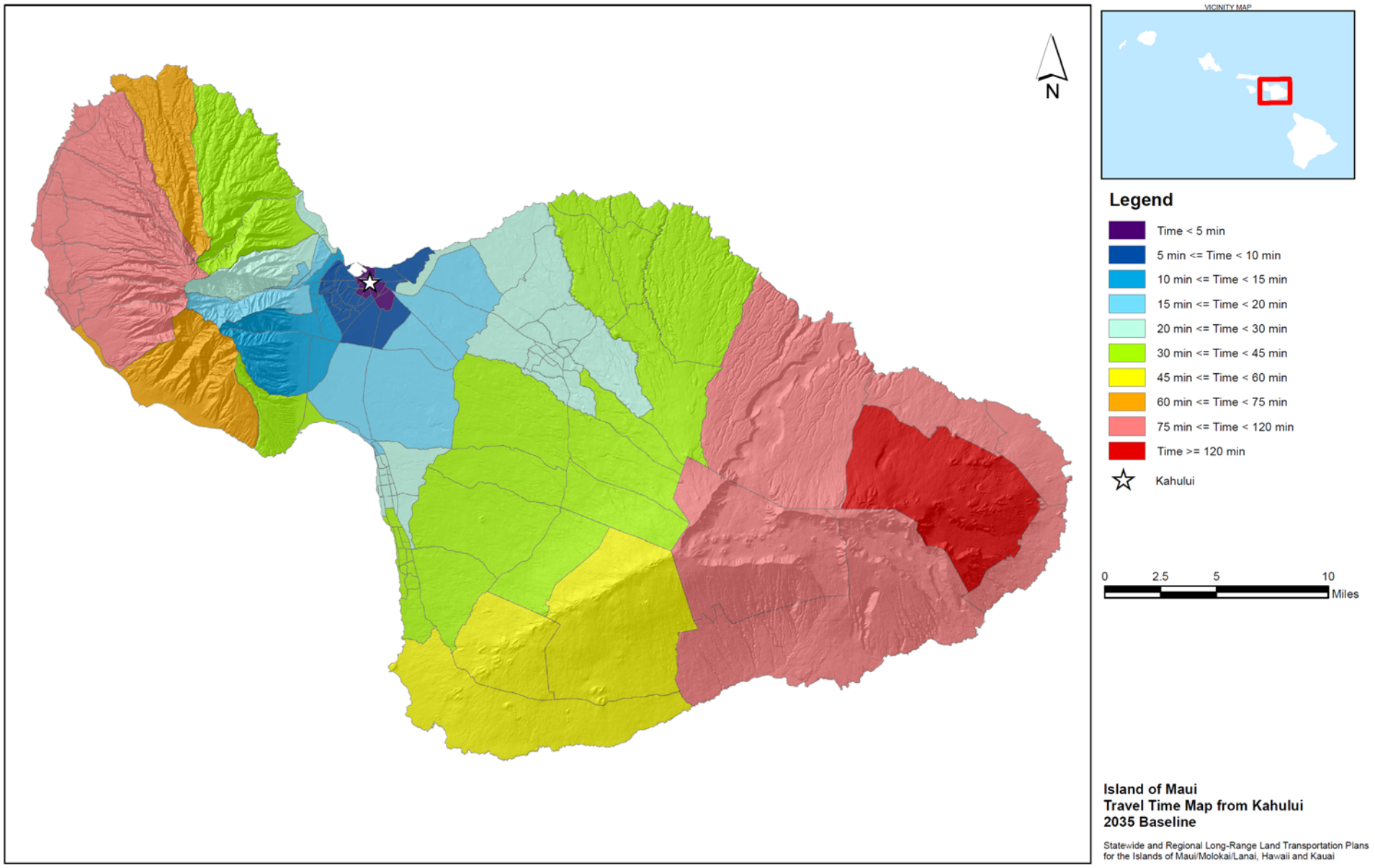


FIGURE 29
2035 Travel Time from Kahului
CH2M HILL, 2012b

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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			
		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

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.

Glossary	
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	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
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
101	48	135	0	0	0	4	4	0	0	0	0	0	0
102	148	416	1,354	153	0	18	171	0	0	0	0	0	0
103	186	405	0	19	0	3	22	0	0	0	0	0	0
104	4	29	0	13	0	0	13	0	0	0	0	0	0
105	0	0	0	418	23	401	842	0	0	0	0	0	0
106	34	119	0	66	0	345	411	0	0	32,368	6,517,710	0	0
107	0	0	0	1,747	1,013	1,135	3,895	0	0	0	0	0	0
108	320	1,117	0	3,743	681	1,294	5,718	0	0	0	0	0	0
109	0	0	0	547	243	243	1,033	0	427	0	0	3,143,083	496,813
110	0	0	0	261	543	217	1,021	0	31	0	0	0	0
111	58	202	0	243	12	582	837	0	0	0	0	0	0
112	38	133	0	465	633	717	1,815	0	0	0	0	0	0
113	180	628	0	67	26	25	118	0	0	0	0	0	0
114	712	2,323	1,006	126	0	14	140	0	0	0	0	0	0
115	859	2,802	0	7	0	392	399	0	0	0	0	0	0
116	289	1,009	0	0	0	7	7	0	0	0	0	0	0
117	427	1,490	0	1	0	23	24	0	0	0	0	0	0
118	163	757	2,589	266	0	32	298	0	0	0	0	0	0
119	254	1,180	0	11	0	0	11	0	0	0	0	0	0
120	368	1,248	0	1	0	2,425	2,426	0	0	0	0	0	0
121	509	1,726	0	9	0	13	22	0	0	0	0	0	0
122	687	2,329	1,015	106	0	15	121	0	0	0	0	0	0
123	824	3,828	0	5	1	43	49	0	0	0	0	0	0
124	387	1,312	0	10	47	122	179	0	12	0	0	0	0
125	255	1,007	0	44	7	11	62	0	0	0	0	0	0
126	46	182	0	0	0	783	783	0	0	0	0	0	0
127	728	1,799	0	646	75	1,507	2,228	0	0	0	0	0	0
128	413	1,630	818	362	55	1,017	1,434	0	0	0	0	0	0
129	184	517	0	45	74	75	194	0	0	0	0	0	0
130	893	2,510	0	1,139	183	850	2,172	0	0	0	0	0	0
131	703	2,775	1,602	403	58	209	670	0	0	0	0	0	0
132	33	93	0	11	0	2	13	0	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	0	0	0	0	0	0
135	650	1,685	0	74	0	84	158	0	352	0	0	0	0
136	535	1,387	0	3	0	5	8	0	352	0	0	0	0
137	282	731	0	108	0	30	138	0	0	0	0	0	0
138	545	1,413	0	26	0	23	49	0	0	0	0	0	0
139	18	47	0	1	0	7	8	0	0	0	0	0	0
140	308	798	0	2	1	27	30	0	0	0	0	0	0
141	144	373	0	3	0	0	3	0	0	0	0	0	0
142	202	524	0	188	111	104	403	0	0	0	0	0	0
143	129	334	0	408	375	269	1,052	0	1,274	0	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	0	0	0	0	0	0
146	70	202	0	13	0	0	13	259,500	0	0	0	0	0
147	93	268	0	8	0	7	15	0	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	0	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												
				EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
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.

Glossary	
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

	Maui Island - Socio-Economic Data Year 2007													Maui Island - Socio-Economic Data Year 2020 Forecast												Maui Island - Socio-Economic Data Year 2035 Forecast											
				EMPLOYMENT													EMPLOYMENT												EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
1	349	1,006	327	335	14	109	458	261,841	164	10	5,271	0	0	400	1,112	343	339	27	161	527	272,164	164	11	5,479	0	0	630	1,678	404	355	35	199	589	306,421	164	13	6,168	0	0
2	0	0	0	25	4	31	60	0	0	0	0	0	0	0	0	0	25	4	31	60	0	0	0	0	0	0	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	85	236	0	0	0	0	0	0	0	0	0	0	0	85	226	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	877	2,438	0	499	8	12	519	0	32	0	0	0	0	1,127	3,001	0	499	10	12	521	0	497	0	0	0	0
5	388	1,187	0	247	0	259	506	525,400	33	0	0	0	0	516	1,434	0	247	0	259	506	546,113	33	0	0	0	0	813	2,165	0	247	5	259	511	614,852	33	0	0	0	0
6	273	835	0	3,960	523	99	4,582	0	44	0	0	0	0	273	759	0	3,960	523	99	4,582	0	77	0	0	0	0	273	727	0	3,960	523	99	4,582	0	242	0	0	0	0
7	169	517	0	70	2	37	109	0	0	0	0	0	0	169	470	0	70	2	37	109	0	0	0	0	0	0	169	450	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	180	500	0	28	0	47	75	0	0	0	0	0	0	180	479	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	145	403	0	0	0	6	6	0	0	0	0	0	0	145	386	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	297	826	0	47	1	16	64	0	0	0	0	0	0	297	791	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	672	1,868	0	231	0	46	277	0	0	0	0	0	0	1,709	4,551	0	231	13	46	290	0	0	0	0	0	0
12	423	887	0	232	14	25	271	0	0	0	0	0	0	423	1,176	0	232	24	61	317	0	0	0	0	0	0	423	1,127	0	232	30	87	349	0	0	0	0	0	0
13	89	187	0	219	78	111	408	0	0	0	0	0	0	164	456	0	219	178	487	884	0	0	0	0	0	0	164	437	0	219	212	534	965	0	0	0	0	0	0
14	0	0	1,450	147	0	49	196	0	0	0	0	0	0	0	0	1,522	147	0	49	196	0	0	0	0	0	0	0	0	1,789	147	0	49	196	0	0	0	0	0	0
15	187	434	0	121	43	71	235	0	42	0	0	0	0	193	536	0	121	43	71	235	0	42	0	0	0	0	193	514	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	956	2,657	0	191	7	106	304	0	0	0	0	0	0	1,013	2,698	0	191	28	153	372	0	0	0	0	0	0
17	0	0	0	0	0	98	98	0	0	0	0	0	0	61	170	0	109	158	694	960	0	0	0	0	0	0	61	162	0	109	208	863	1,180	0	0	0	0	0	0
18	999	2,321	0	537	108	156	801	0	5,934	0	0	0	0	1,177	3,271	0	537	108	156	801	0	5,984	0	0	0	0	1,429	3,806	0	537	108	156	801	0	6,233	0	0	0	0
19	196	455	650	128	4	98	230	0	0	0	0	0	0	196	545	682	128	4	98	230	0	0	0	0	0	0	196	522	802	128	4	98	230	0	0	0	0	0	0
20	133	309	0	49	1	31	81	0	0	0	0	0	0	133	370	0	49	1	31	81	0	0	0	0	0	0	133	354	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	100	278	0	170	0	14	184	0	113	0	0	0	0	100	266	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	884	2,457	0	54	0	57	111	0	0	0	0	0	0	884	2,354	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	2	6	0	0	0	0	0	0	0	0	0	0	0	2	5	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	263	731	0	6	9	64	79	0	0	0	0	0	0	263	700	0	6	14	79	99	0	0	0	0	0	0
25	1	4	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	1	3	0	383	44	335	761	0	0	0	0	0	0
26	9	11	0	8	0	157	165	0	0	0	0	0	0	9	25	0	8	0	157	165	0	0	0	0	0	0	9	24	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	517	1,437	0	77	88	534	699	490,161	0	0	0	0	0	517	1,377	0	77	240	876	1,194	551,857	0	0	0	0	0
28	6	13	0	0	0	0	0	1,322,817	0	0	0	0	0	6	17	0	0	0	0	0	1,374,967	0	0	0	0	0	6	16	0	0	0	0	0	1,548,034	0	0	0	0	0
29	240	520	0	6	0	0	6	0	0	0	0	0	0	490	1,362	0	6	0	0	6	0	0	0	0	0	0	691	1,840	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	6	17	0	2	24	0	26	3,950	0	0	0	0	0	6	16	0	2	24	0	26	4,447	0	0	0	0	0
31	368	798	0	63	2	21	86	0	0	0	0	0	0	485	1,348	0	63	2	21	86	0	0	0	0	0	0	485	1,292	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	1,184	3,291	0	223	64	68	355	0	0	0	0	0	0	1,184	3,153	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	5	14	0	0	0	13	13	0	0	0	0	0	0	5	13	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	1,077	2,994	1,456	465	110	600	1,175	0	0	0	0	0	0	1,313	3,497	1,712	465	112	617	1,193	0	0	0	0	0	0
35	685	1,134	0	46	19	192	257	0	0	0	0	0	0	685	1,904	0	46	19	192	257	0	0	0	0	0	0	685	1,824	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	1,216	3,380	0	335	7	85	427	0	0	0	0	0	0	1,216	3,239	0	335	31	139	506	0	0	0	0	0	0
37	321	2,288	0	2	9	0	11	0	0	0	0	0	0	321	892	0	2	9	0	11	0	0	0	0	0	0	321	855	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	949	2,638	218	465	172	328	965	0	0	0	0	0	0	1,115	2,970	257	685	221	503	1,409	0	0	0	0	0	0
39	306	507	0	0	0	108	108	0	2	0	0	0	0	320	889	0	0	0	108	108	0	2	0	0	0	0	320	852	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	52	145	0	9	0	0	9	0	7	0	0	0	0	77	205	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	99	275	0	8	0	0	8	0	0	0	0	0	0	99	264	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	203	564	0	13	0	7	20	0	0	0	0	0	0	203	541	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	79	220	0	0	0	13	13	0	0	0	0	0	0	79	210	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	175	486	736	531	183	223	937	0	49	0	0	0	0	175	466	865	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	502	1,395	0	287	51	226	564	75,111	0	0	0	0	0	502	1,337	0	287	55	257	599	84,565	0	0	0	0	0
46	101	250	0	1,205	545	479	2,229	264,692	49	0	0	0	0	101	281	0	1,205	548	492	2,244	275,127	51	0	0	0	0	101	269	0	1,205	559	523	2,286	309,757	63	0	0	0	0
47	70	173	0	4	0	4	8	0	0	0	0	0	0	70	195	0	4	0	4	8	0	0	0	0	0	0	70	186	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	441	1,226	0	109	347	130	586	0	0	0	0	0	0	441	1,174	0	109	365	191	664	0	0	0	0	0	0
49	519	2,716	0	211	170	724	1,105	0	0	0	0	0	0	654	1,818	0	216	172	734	1,122	0	0	0	0	0	0	711	1,894	0	238	180	764	1,182	0	0	0	0	0	0
50	3	16	0	0	0	0	0	0	0	0	0	0	0	3	8	0	0	0	0	0	0	0	0	0	0	0	3	8	0	0	0	0	0	0	0	0	0	0	0
51	135	489	0	94	30	349	473	0	0	0	0	0	0	135	375	0	94	51	439	584	0	0	0	0	0	0	135	360	0	94	108	878	1,080	0	0	0	0	0	0
52	647	2,344	0	59	0	32	91	0	0	0	0	0	0	1,020	2,835	0	59	0	32	91	0	0	0	0	0	0	2,884	7,681	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	50	139	0	0	0	0	0	1,418	0	0	0	0	0	1,083	2,884	0	0	0	0	0	1,596	0	0	0	0	0
54	204	416	0	4,057	431	298	4,786	221,562	4,884	0	0	0	0	204	567	0	4,057	431	298	4,786	230,297	4,925	0	0	0	0	204	543	0	4,057	431	298	4,786	259,284	5,203	0	0	0	0
55	156	318	0	38	0	75	113	0	0	0	0	0	0	321	892	0	38	0	75	113	0	0	0	0	0	0	321	855	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	537	1,493	0	203	89	65	357	0	0	0	0	0	0	968	2,578	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	469	1,304	0	65	47	47	159	0	0	0	0	0	0	469	1,249	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	79	220	0	0	0	0	0	0	0	0	0	0	0	483	1,286	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	443	1,231	0	88	77	30	195	0	0	0	0	0	0	443	1,180	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	317	881	0	39	6	52	97	0	0	941	112,026	0	0	721	1,920	0	39	6	52	97	0	0	1,126	126,127	0	0
61	559	1,164	0	100	16	41	157	0	0	0	0	0	0	559	1,554	0	100	16	41	157	0	0	0	0	0	0	559	1,489	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	315	876	0	267	8	177	452	0	80	0	0	0	0	315	839	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	435	1,209	0	1,554	41	625	2,220	0	1,993	0	0	0	0	435	1,159	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	481	1,337	0	227	47	231	505	0	30	0	0	0	0	877	2,336	0	368	149	427	944	0	30	0	0	0	0
65	15	31	0	177	5	0	182	0	0	0	0	0	0	15	42	0	177	5	0	182	0	0	0	0	0	0	15	40	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	242	673	0	2	0	12	14	0	0	0	0	0	0	242	645	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	658	1,829	0	19	15	3	37	0	0	0	0	0	0	658	1,752	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	150	417	860	86	0	5	91	0	0	0	0	0	0	150	399	1,011	86	0	5	91	0	0	0	0	0	0
69	157	584	0	4	0	0	4	0	0	0	0	0	0	157	436	0	4	0	0	4	0	0	0	0	0	0	157	418	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	1,818	5,053	0	27	13	193	233	24,946	9	0	0	0	0	2,126	5,662	0	27	13	193	233	28,086	9	0	0	0	0

	Maui Island - Socio-Economic Data Year 2007													Maui Island - Socio-Economic Data Year 2020 Forecast											Maui Island - Socio-Economic Data Year 2035 Forecast											
				EMPLOYMENT													EMPLOYMENT											EMPLOYMENT										
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
71	272	672	0	1	47	9	57	0	0	0	0	0	0	272	756	0	1	49	30	80	0	0	0	0	0	0	272	724	0	1	50	43	94	0	0	0	0	0	0
72	142	561	0	8	0	0	8	0	19	0	0	0	0	142	395	0	8	0	0	8	0	19	0	0	0	0	142	378	0	8	1	13	22	0	19	0	0	0	0
73	116	288	0	2	5	41	48	862,800	0	0	0	0	0	534	1,484	0	2	5	41	48	896,815	0	0	0	0	0	534	1,422	0	2	5	41	48	1,009,696	0	0	0	0	0
74	457	1,804	0	26	0	10	36	0	0	0	0	0	0	457	1,270	0	26	0	10	36	0	0	0	0	0	0	457	1,217	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	1,801	5,006	939	418	149	2,476	3,043	13,473	0	0	0	0	0	2,409	6,416	1,103	418	220	2,909	3,547	15,169	0	0	0	0	0
76	652	1,620	0	282	0	238	520	0	0	0	0	0	0	652	1,812	0	282	0	238	520	0	0	0	0	0	0	652	1,736	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	314	873	0	19	19	157	196	0	0	0	0	0	0	1,329	3,539	0	79	30	226	336	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	266	739	0	0	0	0	0	0	0	0	0	0	0	1,106	2,946	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	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
80	0	0	0	155	1,053	413	1,621	0	0	0	0	0	0	0	0	0	238	1,082	718	2,038	0	0	0	0	0	0	0	0	0	353	1,096	803	2,252	0	0	0	0	0	0
81	4	14	0	0	0	49	49	38,453	0	0	0	0	0	4	11	0	590	210	2,220	3,021	39,969	0	0	0	0	0	4	11	0	2,515	536	4,223	7,273	45,000	0	0	0	0	0
82	0	0	0	598	6	170	774	0	0	0	0	0	0	0	0	0	598	6	170	774	0	0	0	0	0	0	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	0	0	0	5	2	20	27	0	0	0	0	0	0	0	0	0	649	163	1,013	1,825	0	0	0	0	0	0
84	0	0	0	1	147	0	148	0	0	0	0	0	0	0	0	0	217	224	795	1,236	0	0	0	0	0	0	0	0	0	918	309	1,315	2,541	0	0	0	0	0	0
85	171	597	0	8	341	73	422	0	0	0	0	0	0	185	514	0	8	341	73	422	0	0	0	0	0	0	185	493	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	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	0
87	0	0	0	142	86	23	251	0	0	0	0	0	0	0	0	0	142	86	23	251	0	0	0	0	0	0	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	1,082	3,007	0	347	124	1,324	1,794	0	0	0	0	0	0	2,741	7,300	0	829	182	1,683	2,694	0	0	0	0	0	0
89	247	837	327	81	0	38	119	0	0	0	0	0	0	684	1,901	343	81	0	38	119	0	0	0	0	0	0	870	2,317	404	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	823	2,288	0	0	0	1	1	0	0	0	0	0	0	1,046	2,786	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	154	428	0	0	0	0	0	0	0	0	0	0	0	154	410	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	17	47	0	0	0	0	0	0	0	0	0	0	0	17	45	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	240	667	0	2	0	2	4	0	0	0	0	0	0	240	639	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	377	1,048	503	140	2	94	236	0	0	0	0	0	0	377	1,004	591	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	581	1,615	0	31	6	9	46	0	0	0	0	0	0	581	1,547	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	146	406	0	12	0	47	59	0	0	0	0	0	0	146	389	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	355	987	0	70	73	715	858	0	0	0	0	0	0	355	945	0	70	77	731	879	0	0	0	0	0	0
98	188	529	0	2	0	5	7	0	0	0	0	0	0	188	523	0	2	0	5	7	0	0	0	0	0	0	188	501	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	647	1,798	0	12	6	69	87	0	29	0	0	0	0	647	1,723	0	12	6	69	87	0	173	0	0	0	0
100	210	591	0	277	0	11	288	0	0	0	0	0	0	210	584	0	299	223	594	1,116	0	0	0	0	0	0	210	559	0	330	344	840	1,514	0	0	0	0	0	0
101	48	135	0	0	0	4	4	0	0	0	0	0	0	48	133	0	0	0	4	4	0	0	0	0	0	0	48	128	0	0	0	4	4	0	0	0	0	0	0
102	148	416	1,354	153	0	18	171	0	0	0	0	0	0	153	425	1,422	153	0	18	171	0	0	0	0	0	0	153	407	1,671	153	0	18	171	0	0	0	0	0	0
103	186	405	0	19	0	3	22	0	0	0	0	0	0	202	561	0	19	0	3	22	0	0	0	0	0	0	202	538	0	19	0	3	22	0	0	0	0	0	0
104	4	29	0	13	0	0	13	0	0	0	0	0	0	4	11	0	13	0	0	13	0	0	0	0	0	0	11	29	0	14	0	0	14	0	0	0	0	0	0
105	0	0	0	418	23	401	842	0	0	0	0	0	0	0	0	0	418	23	401	842	0	24	0	0	0	0	0	0	0	493	32	457	983	0	144	0	0	0	0
106	34	119	0	66	0	345	411	0	0	32,368	6,517,710	0	0	34	95	0	66	0	345	411	0	0	34,995	6,774,660	0	0	34	91	0	66	0	345	411	0	0	41,905	7,627,384	0	0
107	0	0	0	1,747	1,013	1,135	3,895	0	0	0	0	0	0	0	0	0	1,772	1,022	1,228	4,022	0	0	0	0	0	0	0	0	0	1,807	1,026	1,254	4,088	0	0	0	0	0	0
108	320	1,117	0	3,743	681	1,294	5,718	0	0	0	0	0	0	320	889	0	3,743	681	1,294	5,718	0	0	0	0	0	0	320	852	0	3,743	681	1,294	5,718	0	0	0	0	0	0
109	0	0	0	547	243	243	1,033	0	427	0	0	3,143,083	496,813	0	0	0	616	279	614	1,509	0	451	0	0	3,398,151	516,399	0	0	0	711	296	718	1,725	0	567	0	0	4,069,203	581,398
110	0	0	0	261	543	217	1,021	0	31	0	0	0	0	0	0	0	261	543	217	1,021	0	31	0	0	0	0	401	1,068	0	261	543	217	1,021	0	31	0	0	0	0
111	58	202	0	243	12	582	837	0	0	0	0	0	0	547	1,520	0	243	22	681	946	0	0	0	0	0	0	547	1,457	0	243	26	709	978	0	0	0	0	0	0
112	38	133	0	465	633	717	1,815	0	0	0	0	0	0	38	106	0	486	653	927	2,066	0	0	0	0	0	0	153	407	0	515	663	986	2,164	0	0	0	0	0	0
113	180	628	0	67	26	25	118	0	0	0	0	0	0	215	598	0	67	26	25	118	0	0	0	0	0	0	272	724	0	67	26	25	118	0	0	0	0	0	0
114	712	2,323	1,006	126	0	14	140	0	0	0	0	0	0	712	1,979	1,056	126	0	14	140	0	0	0	0	0	0	712	1,896	1,242	126	0	14	140	0	0	0	0	0	0
115	859	2,802	0	7	0	392	399	0	0	0	0	0	0	859	2,388	0	7	0	392	399	0	0	0	0	0	0	859	2,288	0	7	0	392	399	0	0	0	0	0	0
116	289	1,009	0	0	0	7	7	0	0	0	0	0	0	289	803	0	0	0	7	7	0	0	0	0	0	0	289	770	0	0	0	7	7	0	0	0	0	0	0
117	427	1,490	0	1	0	23	24	0	0	0	0	0	0	427	1,187	0	1	0	23	24	0	0	0	0	0	0	427	1,137	0	1	0	23	24	0	0	0	0	0	0
118	163	757	2,589	266	0	32	298	0	0	0	0	0	0	163	453	2,718	266	0	32	298	0	0	0	0	0	0	163	434	3,195	266	0	32	298	0	0	0	0	0	0
119	254	1,180	0	11	0	0	11	0	0	0	0	0	0	254	706	0	11	0	0	11	0	0	0	0	0	0	254	676	0	11	0	0	11	0	0	0	0	0	0
120	368	1,248	0	1	0	2,425	2,426	0	0	0	0	0	0	455	1,265	0	1	4	2,467	2,472	0	0	0	0	0	0	492	1,310	0	1	6	2,479	2,486	0	0	0	0	0	0
121	509	1,726	0	9	0	13	22	0	0	0	0	0	0	596	1,657	0	9	0	13	22	0	0	0	0	0	0	633	1,686	0	9	0	13	22	0	0	0	0	0	0
122	687	2,329	1,015	106	0	15	121	0	0	0	0	0	0	687	1,910	1,066	106	0	15	121	0	0	0	0	0	0	687	1,830	1,253	106	0	15	121	0	0	0	0	0	0
123	824	3,828	0	5	1	43	49	0	0	0	0	0	0	911	2,532	0	5	1	43	49	0	0	0	0	0	0	948	2,525	0	5	1	43	49	0	0	0	0	0	0
124	387	1,312	0	10	47	122	179	0	12	0	0	0	0	387	1,076	0	10	82	486	578	0	12	0	0	0	0	387	1,031	0	10	99	588	696	0	12	0	0	0	0
125	255	1,007	0	44	7	11	62	0	0	0	0	0	0	255	709	0	44	7	11	62	0	0	0	0	0	0	255	679	0	44	7	11	62	0	0	0	0	0	0
126	46	182	0	0	0	783	783	0	0	0	0	0	0	46	128	0	0	181	2,654	2,835	0	0	0	0	0	0	46	123	0	0	181	2,654	2,835	0	0	0	0	0	0
127	728	1,799	0	646	75	1,507	2,228	0	0	0	0	0	0	732	2,035	0	704	97	1,735	2,536	0	0	0	0	0	0	833	2,218	0	784	108	1,800	2,691	0	0	0	0	0	0
128	413	1,630	818	362	55	1,017	1,434	0	0	0	0	0	0	413	1,148	859	362	60	1,070	1,492	0	0	0	0	0	0	457	1,217	1,010	362	60	1,070	1,492	0	0	0	0	0	0
129	184	517	0	45	74	75	194	0	0	0	0	0	0	184	511	0	45	74	75	194	0	0	0	0	0	0	184	490	0	45	74	75	194	0	0	0	0	0	0
130	893	2,510	0	1,139	183	850	2,172	0	0	0	0	0	0	893	2,482	0	1,163	191	938	2,292	0	0	0	0	0	0	893	2,378	0	1,200	196	965	2,362	0	0	0	0	0	0
131	703	2,775	1,602	403	58	209	670	0	0	0	0	0	0	764	2,124	1,682	415	96	600	1,110	0	0	0	0	0	0	764	2,035	1,977	431	117	728	1,275	0	0	0	0	0	0
132	33	93	0	11	0	2	13	0	0	0	0	0	0	33	92	0	11	0	2	13	0	0	0	0	0	0	33	88	0	11	0	2	13	0	0	0	0	0	0
133	39	110	0	0	0	0	0	0	0	0	0	0	0	45	125	0	0	0	0	0	0	0	0	0	0	0	45	120	0	0	0	0	0	0	0	0	0	0	0
134	483	1,365	0	5	2	7	14	0	0	0	0	0	0	483	1,343	0	5	2	7	14	0	0	0	0	0	0	483	1,286	0	5	6	7	18	0	0	0	0	0	0
135	650	1,685	0	74	0	84	158	0	352	0	0	0	0	650	1,807	0	74	0	84	158	0	352	0	0	0	0	650	1,731	0	74	0	84	158	0	352	0	0	0	0
136	535	1,387	0	3	0	5	8	0	352	0	0	0	0	535	1,487	0	3	0	5	8	0	406	0	0	0	0	535	1,425	0	3	0	5	8	0	938	0	0	0	0
137	282	731	0	108	0	30	138	0	0	0	0	0	0	282	784	0	108	0	30	138	0	0	0	0	0	0	282	751	0	108	0	30	138	0	0	0	0	0	0
138	545	1,413	0	26	0	23	49	0	0	0	0	0	0	561	1,559	0	26	0	23	49	0	0	0	0	0	0	561	1,494	0	26	0	23	49	0	0	0	0	0	0
139	18	47	0	1	0	7	8	0	0	0	0	0	0	167	464	0	1	0	7	8	0	0	0	0	0	0	167	445	0	1	0	7	8	0	0	0	0	0	0
140	308	798	0	2	1	27	30	0	0	0	0	0	0	333	926	0	2	1	27	30	0	0	0	0	0	0	333	887	0	2	1	27	30	0	0	0	0	0	0

	Maui Island - Socio-Economic Data Year 2007													Maui Island - Socio-Economic Data Year 2020 Forecast												Maui Island - Socio-Economic Data Year 2035 Forecast											
				EMPLOYMENT													EMPLOYMENT												EMPLOYMENT									
TAZ	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR	HH	POP	SCHL ENR	OTHER EMP	RETAIL EMP	SERVICE EMP	TOT EMP	VIS ATT	VISITOR ACCOM	AIR TONS	AIR PASNGR	HARBOR TONS	HARBOR PSNGR
141	144	373	0	3	0	0	3	0	0	0	0	0	0	144	400	0	3	0	0	3	0	0	0	0	0	0	144	384	0	3	0	0	3	0	0	0	0	0	0
142	202	524	0	188	111	104	403	0	0	0	0	0	0	202	561	0	188	145	234	567	0	0	0	0	0	0	317	844	0	188	169	286	643	0	0	0	0	0	0
143	129	334	0	408	375	269	1,052	0	1,274	0	0	0	0	151	420	0	408	432	484	1,323	0	1,274	0	0	0	0	323	860	0	408	466	565	1,440	0	1,274	0	0	0	0
144	105	272	0	0	0	0	0	0	0	0	0	0	0	105	292	0	0	0	0	0	0	0	0	0	0	0	105	280	0	0	0	0	0	0	0	0	0	0	0
145	995	3,577	277	1,157	100	560	1,817	0	0	0	0	0	0	1,824	5,070	291	1,398	322	1,398	3,117	0	0	0	0	0	0	3,953	10,528	342	1,544	322	1,698	3,564	0	0	0	0	0	0
146	70	202	0	13	0	0	13	259,500	0	0	0	0	0	72	200	0	13	0	0	13	269,730	0	0	0	0	0	72	192	0	13	0	0	13	303,681	0	0	0	0	0
147	93	268	0	8	0	7	15	0	0	0	0	0	0	96	267	0	8	0	7	15	0	0	0	0	0	0	96	256	0	8	0	7	15	0	0	0	0	0	0
148	154	444	0	0	0	0	0	0	0	0	0	0	0	159	442	0	0	0	0	0	0	0	0	0	0	0	159	423	0	0	0	0	0	0	0	0	0	0	0
149	371	804	0	46	0	267	313	0	0	0	0	0	0	376	1,045	0	46	0	267	313	0	0	0	0	0	0	376	1,001	0	46	0	267	313	0	0	0	0	0	0
150	36	78	0	0	0	0	0	0	0	0	0	0	0	36	100	0	0	0	0	0	0	0	0	0	0	0	36	96	0	0	0	0	0	0	0	0	0	0	0
151	132	286	455	56	0	40	96	0	0	0	0	0	0	174	484	478	56	0	40	96	0	0	0	0	0	0	174	463	562	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	636	1,768	0	286	6	49	341	30,429	0	0	0	0	0	636	1,694	0	286	6	49	341	34,259	0	0	0	0	0
153	469	2,454	2,235	228	0	17	245	0	77	0	0	0	0	469	1,304	2,347	228	0	17	245	0	77	0	0	0	0	469	1,249	2,758	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	375	1,042	0	1,060	13	110	1,183	0	3,179	0	0	0	0	375	999	0	1,060	13	110	1,183	0	3,359	0	0	0	0
155	659	1,372	0	92	42	76	210	0	78	0	0	0	0	682	1,896	0	92	42	76	210	0	78	0	0	0	0	682	1,816	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	119	331	0	1	0	9	10	0	0	0	0	0	0	119	317	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	956	2,657	0	166	22	37	225	0	0	0	0	0	0	956	2,546	0	171	23	40	234	0	0	0	0	0	0
158	2,059	4,479	441	238	65	154	457	0	0	0	0	0	0	2,068	5,748	463	244	69	161	474	0	0	0	0	0	0	2,068	5,508	544	251	71	175	496	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**	**58,674**	**163,093**	**19,984**	**37,698**	**11,442**	**38,137**	**87,273**	**4,544,670**	**19,523**	**35,947**	**6,892,165**	**3,398,151**	**516,399**	**74,105**	**197,356**	**23,492**	**42,964**	**13,075**	**45,997**	**102,034**	**5,116,704**	**21,784**	**43,044**	**7,759,679**	**4,069,203**	**581,398**



Appendix E

Public Involvement Summary

APPENDIX E

Public Involvement Summary for the Regional Federal-Aid Highways 2035 Transportation Plan District of Maui

Introduction

Public involvement was a key component in the development of the Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui (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's 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 (FHWA) Title VI and Environmental Justice (EJ) 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 Maui District -specific Citizen Advisory Committee (CAC) was not formed due to the low number of applications received. The SAC provided specific input for the District of Maui. Four out of twenty SAC members were from the District of Maui. 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 Maui 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.

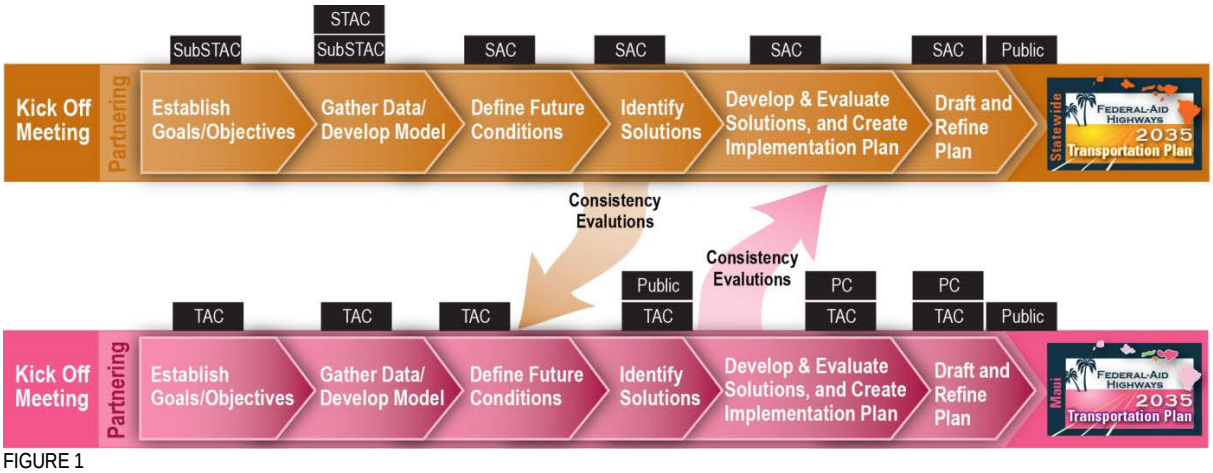


FIGURE 1
Project Development Process

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 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 defendable 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 Maui - Department of Public Works
County of Maui - Planning Department
County of Maui - Department of Transportation
County of Maui - Civil Defense Agency
County of Maui - Police Department
County of Maui – Department of Fire and Public Safety
HDOT Maui 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 26, 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 Maui District's transportation system, which included secondary access/alternative emergency routes, inter-modal connectivity and integration, mass transit, mauka/makai connectors, cultural/historic considerations (Ahupuaa), enhancing safety, diversity of funding sources, land use and transportation network compatibility, agency coordination, transportation system resilience, and reducing reliance of fossil fuels, etc.
- **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 17, 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. The TAC was also asked to assist with defining future conditions and land use forecast.

TAC Meeting #4 (via videoconference), May 23, 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 Statewide Transportation Improvement Program (STIP), and provided status updates and project details. The TAC also provided input on non-capacity needs.

TAC Meeting #5, November 15, 2011, 9:00 am to noon

- **Goal Priorities.** The TAC reviewed the resulting goal priorities for Maui 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. The TAC also noted that a few discrepancies in the model.
- **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 Maui - Department of Public Works
County of Maui - Planning Department
County of Maui – Department of Transportation

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, April 9, 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. 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 5, 2014, 10:00 am to 11:30 am

- **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

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 provided 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 public meetings were held on Maui. 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 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 12, 2012, 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.
  - Modal Integration
    - Bicycle/pedestrian system connectivity and provide sidewalks within a mile of all schools

- Increase public transit routes, higher frequency service, study feasibility of mass transit options
- Pass/implement a complete streets resolution

– Economic Vitality
- New/bypass roadways (enhance roadways in economic opportunity areas), Kihei-North-South Collector, Kihei Mauka roadway, Honoapiilani Highway between Launiupoko and Maalaea, Airport Access Road, Paia Bypass, and Lahaina Bypass

– Security and Safety:
- Coastal highway erosion, Honoapiilani Highway realignment
- Pedestrian/bicycle safety, Haleakala bicycle safety, traffic calming within residential/school areas

Public Meeting #2, April 2, 2014, 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.

Attendees were given a budget of $100 to construct a range of land transportation projects that they felt best supported 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 large 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	$23	$38	$27
Safety	$6	$4	$8
Capacity	$55	$10	$45
Congestion	$4	$6	$8
Other	$12	$12	$12
Total	**$100**	**$70 ($30 for contingency)**	**$100**

In general, the public felt that it is important to add capacity by providing more pedestrian and bicycle facilities, enhance safety by providing refuge islands, traffic-calming features, and other innovation solutions, such as roundabout. The public also felt that it is important to preserve the existing land transportation system. 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. How will the projects be implemented?

   Response: This Plan sets the transportation vision and long-term goals and its recommendations are without fiscal constraints. Priorities from the long-range plan will be considered when the mid-range plan is being developed based on fiscal constraints. Both the long-range plan and mid-range plan will provide guidance to and feed projects into the STIP, and ultimately into the project delivery process.

2. Who are the decision-makers?

   Response: The decision-makers are the HDOT administration and the state legislature, as well as the County Council.

3. Who are the implementing agencies?

   Response: It requires cooperation and coordination of FHWA, the HDOT, the County, and sometimes the transit agency.

4. Who develops the mid-range plan and the STIP?

   Response: The plans are put together by HDOT staff with input from the counties, vetted by the communities, and approved by the HDOT administration.

5. How do you determine the percentage of funds for each county?

   Response: The distribution of funds varies every year. Typically, there is a formula to calculate the percentages. Factors include average daily traffic volume, revenue, vehicle miles traveled, and population etc. For federal funded projects, the Federal usually contributes 80 percent and local agency contributes 20 percent.

6. Consider the minimization and mitigation of environmental impacts from construction. Construction near Lahaina destroyed beaches and the coral reefs are dying.

   Response: The construction may be an emergency repair project. There is a different process for emergency repair.

7. The Paia Bypass project is critical and it should be a top priority for the region.

8. Is there going to be a public meeting for the mid-range plan?

   Response: Public involvement is not required for the development of the mid-range plan. However, public meetings are conducted for the STIP updates. A series of meetings will be held in April and May this year.

Outreach to Molokai and Lanai Stakeholders

The project management team specifically reached out by phone and email, and held face-to-face meetings with stakeholders on Molokai and Lanai to get their input. These stakeholders are listed in Table 5.

TABLE 5
Molokai and Lanai Stakeholders

Molokai	Lanai
County Councilmember	County Councilmember
Molokai Community Service Council	Castle and Cooke
Molokai Chamber of Commerce	Lanai Community Association
Molokai Dispatch	Friends of Lanai
Molokai Land	Lanaians for Sensible Growth
	Lanai Today
	Business Advocate

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 providing safe facilities for bicyclists and pedestrians and intersection improvements. The project management team reviewed the comments 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. About 100 stakeholder groups located in the Maui 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 *Maui 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 *Damon Tucker: Hawaii News & Information* (http://damontucker.com), *KHON2, Lahaina News, Maui News, Maui Now, and Maui* Weekly in February 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 received were in regards to meeting logistics, additional information requests, and traffic relief for Paia.

Additional Approaches for SAC and CAC Solicitation

In addition to making the announcement 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 as follow:

Other Project - 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 conducted 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 on Maui met with the Deputy Director of the Department of Transportation of Maui County on several occasions to brainstorm community members that would potentially be a SAC/CAC member. She also met with some candidates and contacted other candidates by phone. Unfortunately, potential 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 Maui)

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 Maui (Plan).

As part of the development of the Plan, the federal-aid highways within the District of Maui 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 in Figure 1. These steps are described in greater detail in the body of this memorandum.

FIGURE 1
Seven-step Process for Solution Evaluation





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 Hawaii 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 or planning factors. The eight planning factors are 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		
1.1. Preserve and enhance the natural environment, including biological and aesthetic resources.	» 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.	» 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.
1.2. Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.	» Avoid, minimize, and provide reasonable measures to mitigate degradation of Hawaii's cultural resources environment caused by transportation facilities and operations.	» 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.
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.	» 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.	» Periodically evaluate environmental regulation compliance, evaluate compliance goals, and prioritize improvements needed. » Consult and collaborate with regulatory agencies to implement solutions.
1.4. Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	» 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	» 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.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
	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.	» Develop an evaluation tool for measuring sustainability over the life cycle of a transportation project or program. » Use integrated action plans from DBEDT'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.
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.	» 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.	» 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).
Federal Planning Factor: Modal Integration		
2.1. Provide a Complete Streets transportation system of motorized and nonmotorized options.	» 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.	» 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).

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
2.2. Promote efficient travel between modes by creating connections and removing barriers.	» 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.	» 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.
2.3. Promote safe connections between modal alternatives.	» Provide transportation modal options and connections that address safety considerations of all users, especially at-risk population segments (children, elderly, disabled).	» 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.
Federal Planning Factor: System Preservation		
3.1. Manage transportation assets and optimize investments.	» Plan and implement maintenance, resurfacing, rehabilitation, and reconstruction to optimize existing transportation system improvements and spending.	» 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 life cycle 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.
3.2. Maintain safe, efficient, complete transportation system for the long-term.	» Plan and implement existing system improvements to effectively sustain the overall transportation system's safe, efficient, and complete operations.	» 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.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: Security		
4.1. Plan, maintain, and operate a transportation system that supports evacuation, response and recovery for incidents.	» 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	» 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)
4.2. Improve resiliency of the state through the transportation system.	» 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.	» 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.
Federal Planning Factor: 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	» 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	» 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.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
manner.	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).	» 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.
Federal Planning Factor: System Efficiency Management and Operations		
6.1. Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.	» Improve consistency and predictability of travel time along existing corridors. » Preserve the functional classification system hierarchical operating characteristics.	» 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.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
Federal Planning Factor: Transportation Access Mobility		
7.1. Provide appropriate and reliable transportation access options statewide to all users.	» Provide services and infrastructure to support modal alternatives for all demographics.	» 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.
7.2. Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves EJ populations).	» Prioritize projects equitably to serve all modes and demographics, with attention to underserved communities.	» 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		
8.1. Maintain a safe transportation system for all land transportation modes.	» 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.	» Coordinate with the Strategic Highway Safety Plan to implement plan recommendations and monitor performance, including: - 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

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
		- 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. » 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.	» Provide emergency access to all parts of the state, especially in locations with only one road in and out.	» 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	» 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	» 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).
9.2. Optimize project delivery.	» Improve coordination of plans and resources. » Improve efficiency of planning and delivery of projects.	» 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.

TABLE 1
Goals, Objectives, and Strategies

Goals	Objectives	Strategies
		» 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.	» Monitor, evaluate and develop solutions, and adjust program goals on a continuing periodic coordinated basis.	» 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.	» Continue the safe accommodation and installation of utility facilities within the right-of-way or easement along state highways and federal-aid county highways.	» 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 the District of Maui's land transportation system (including Molokai and Lanai) and its 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 Maui Technical Advisory Committee (TAC). Using Stakeholder Advisory Committee (SAC) goal weightings as input, the Maui TAC assigned weights to the goals to reflect regional priorities. See Table 2.

The Maui 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 Maui TAC work session was averaged. The Maui TAC weights, along with the SAC goal weights, are shown in Table 2.

TABLE 2
Goal Priority Weighting

Goals	Goal Priority Weight	
	SAC	Maui TAC
Environment and Sustainability Goals		
1.1 Preserve and enhance the natural environment, including biological and aesthetic resources.	**2.8%**	**4.0%**
1.2 Preserve and enhance Hawaii's cultural resources environment, including archaeological and historical sites.	**3.9%**	**4.0%**
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%**	**4.0%**
1.4 Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	**5.9%**	**4.0%**
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.	**7.6%**	**5.0%**
Modal Integration Goals		
2.1 Provide a Complete Streets transportation system of motorized and nonmotorized options.	**8.1%**	**8.0%**
2.2 Promote efficient travel between modes by creating connections and removing barriers.	**7.1%**	**6.0%**
2.3 Promote safe connections between modal alternatives.	**5.0%**	**5.0%**
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%**	**6.0%**
Security Goals		
4.1 Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.	**5.4%**	**5.0%**
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%**	**5.0%**
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%**	**5.0%**
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%**	**7.0%**
8.2 Improve safety of the community through connectivity of the transportation infrastructure.	**3.4%**	**4.0%**

TABLE 2
Goal Priority Weighting

Goals	Goal Priority Weight	
	SAC	Maui TAC
Additional Goals, Objectives and Strategies		
9.1 Obtain sufficient and specific transportation funding.	**4.2%**	**4.0%**
9.2 Optimize project delivery.	**1.7%**	**3.0%**
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%**	**3.0%**
	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 FY2006-2009 Contract Awards) and estimated future spending is based on the FY2011-2014 STIP 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%**



Step 3. Develop Solutions

After understanding the issues and transportation needs on the federal-aid highway system on Maui, Molokai, and Lanai, 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 Maui, Molokai, and Lanai 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 Maui.



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, all 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 all stakeholder groups for validation. The Tier 1 evaluation worksheet is shown in Table 4.

TABLE 4
Tier 1 Pass/Fail Criteria

Tier 1 Evaluation Matrix – Pass/Fail	
Criteria	**Pass/Fail**
HDOT Highways Mission: Is the solution in alignment with the HDOT Highways Division mission? The mission of the Highways Division is to provide a safe, and efficient and accessible highway system through the use of available resources in the maintenance, enhancement, and support of land transportation facilities.	
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?	
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?	
Completeness: Is the solution complete? Does it account for all necessary investments or actions to ensure the realization of the solution's objective?	
Acceptable: Is the solution implementable and acceptable in terms of applicable laws, regulations, and public policies?	
Redundant: Is the need/deficiency already being addressed independent of this planning process?	

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 project management team (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			
Goal 1.1: Preserve and enhance the natural environment, including biological and aesthetic resources.	-2: Solution does not meet any of the five evaluation criteria related the natural environment -1: Solution meets one of the five evaluation criteria related the natural environment 0: Solution meets two of the five evaluation criteria related the natural environment 1: Solution meets three of the five evaluation criteria related the natural environment 2: Solution meets at least four of five evaluation criteria related the natural environment	Source: DBEDT GIS – Natural Resource/Environmental Layers and Physical Features Layers http://www.state.hi.us/dbedt/gis/download.htm Source: Hawaii Scenic Byways Program – Program Objectives 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? 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
Goal 1.2: Preserve and enhance Hawaii's cultural resources and environment, including archaeological and historical sites.	-2: Direct impact to archaeological or cultural resources (that cannot be mitigated) -1: Potential impacts to archaeological or cultural resources (that cannot be mitigated) 0: No impacts/enhancements to archaeological or cultural resources 1: Potential enhancements to existing archaeological or cultural resources 2: Enhances existing archaeological or cultural resources	Source: State Historic Preservation Division (SHPD) - Hawaii Register of Historic Places http://hawaii.gov/dlnr/hpd/ Does the potential solution affect any place listed on the National and State Register of Historic Places for Hawaii?	
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.	-2: Does not meet any of the three evaluation criteria related to environmental regulations and standards -1: - 0: Meets at least one of the three evaluation criteria related to environmental regulations and standards 1: - 2: Meets all three of the relevant evaluation criteria related to environmental regulations and standards	Source: United States Environmental Protection Agency http://www.epa.gov/aboutepa/whatwedo.html Source: Hawaii Department of Health (Office of Environmental Quality Control) http://hawaii.gov/health/environmental/oeqc/index.html Source: Hawaii Statewide Transportation Plan 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)?	
Goal 1.4: Promote the use of sustainable practices in designing, constructing, operating, and maintaining transportation facilities and programs.	-2: Solution does not meet any of the five evaluation criteria related to sustainable practices -1: Solution meets one of the five evaluation criteria related to sustainable practices 0: Solution meets two of the five evaluation criteria related to sustainable practices	Source: Hawaii 2050 Sustainability Plan http://www.hawaii2050.org/index.php/site/sp_goals Is the solution aligned with goals and strategic actions of the Hawaii 2050 Sustainability Plan? Specifically, is the solution expected to: 1. Improve energy efficiencies and options in transportation? 2. Increase access to public transportation? 3. Reduce traffic congestion?	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
	1: Solution meets three of the five evaluation criteria related to sustainable practices. 2: Solution meets at least four of five evaluation criteria related to sustainable practices.	4. Encourage and provide incentives for telecommuting? 5. Increase and improve bicycle and pedestrian facilities, including multiuse pathways?	
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.	-2: Does not meet either evaluation criteria related to potential climate change or energy efficiency. -1: 0: Meets one of the evaluation criteria related to potential climate change or energy efficiency. 1: 2: Meets both evaluation criteria related to potential climate change and energy efficiency.	Source: Hawaii Clean Energy Initiative (HCEI) http://www.hawaiicleanenergyinitiative.org/ Source: Regional travel demand model travel times Source: Hawaii Statewide Transportation Plan 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]	
Modal Integration			
Goal 2.1: Provide a Complete Streets transportation system of motorized and nonmotorized options.	-2: Does not support the two Complete Streets principles listed under the Evaluation Criteria. -1: - 0: No impacts to the multimodal transportation system. 1: - 2: Aligns with the two Complete Streets principles listed under the Evaluation Criteria.	Source: Hawaii Complete Streets – Final Complete Streets Legislative Report (November 2010) Does the solution support the following principles listed in the final Complete Streets legislative report? 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.	

[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
Goal 2.2: Promote efficient travel between modes by creating connections and removing barriers.	-2: Creates barriers to multimodal connection opportunities. -1: No multimodal connection opportunities. 0: No impacts to multimodal system. 1: Provides multimodal connection opportunities. 2: Provides multimodal connection opportunities between multiple modes of travel.	Source: Hawaii Statewide Pedestrian Master Plan – Existing Bus Route maps (Maps K-2, M-2, H-3) Source: HDOT Highway Performance Monitoring System (HPMS) Does the solution improve existing connections to and between vehicles, transit and nonmotorized modes?	
Goal 2.3: Promote safe connections between modal alternatives.	-2: Does not support the Complete Streets principle listed under the Evaluation Criteria. -1: - 0: No impacts to the multimodal transportation system. 1: - 2: Aligns with the Complete Streets principle listed under the Evaluation Criteria.	Source: Hawaii Complete Streets – Final Complete Streets Legislative Report (November 2010) Does the solution support the following principle listed in the final Complete Streets legislative report? 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.	
System Preservation			
Goal 3.1: Manage transportation assets and optimize investments.	-2: Solution causes adverse impacts to transportation assets (pavement, bridge, or structure) by minimizing lifecycle costs. -1: 0: Solution is not applicable to either of the two Evaluation Criteria, or existing asset (pavement, bridge, or structure) data are insufficient. 1: 2: Solution meets either of the two Evaluation Criteria.	Source: HDOT State Route System – Road Inventory Line Diagrams Source: HDOT Bridge Program – 10-year Plan Rehabilitation and Replacement Schedule Source: HDOT HPMS 1. For roadway pavement improvements, does the solution optimize lifecycle 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 *after* 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?	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
Goal 3.2: Maintain a safe, efficient, complete transportation system for the long-term.	-2: Solution causes adverse impacts to transportation assets by reducing useful life of facility. -1: 0: No impacts to maintaining the existing transportation system or solution is not applicable to either of the two Evaluation Criteria. 1: Solution meets one of the two Evaluation Criteria. 2: Solution meets both Evaluation Criteria.	Source: FHWA Pavement Preservation Definitions (2005) http://www.fhwa.dot.gov/pavement/preservation/091205.cfm Source: FHWA Bridge Preservation Guide (2011) http://www.fhwa.dot.gov/bridge/preservation/guide/index.cfm Source: HDOT Bridge Program – 10 Year Plan Rehabilitation and Replacement Schedule 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: a) Washing or cleaning of bridge/pavement? b) Sealing asphalt cracks or concrete joints? c) Overlaying thin layers of asphalt? d) Facilitating or improving drainage? e) Removing debris? f) Maintaining adjacent vegetation and landscaping? 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: a) Serves as the single access to a community or area? b) Is a key emergency evacuation route or emergency service corridor?	
Security			
Goal 4.1: Plan, maintain, and operate a transportation system that supports evacuation, response, and recovery for incidents.	-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.	Hawaii State Civil Defense – 2010 Hazard Mitigation Plan http://www.scd.hawaii.gov/2010_hmp.html (refers to individual island multihazard plans) Source: Kauai Multi-Hazard Mitigation Strategy 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? Source: Hawaii County Multi-Hazard Mitigation Plan	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
	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.	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? Source: Maui County Multi-Hazard Mitigation Plan 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?	
Goal 4.2: Improve resiliency of the state through the transportation system.	-2: Not in alignment with preparedness plans, and does not support transportation infrastructure and facilities vital to recovery. -1: 0: No impact to supporting resiliency of the state during recovery periods. 1: 2: Supports preparedness plans, and protects transportation infrastructure and facilities vital to recovery.	Hawaii State Civil Defense – 2010 Hazard Mitigation Plan http://www.scd.hawaii.gov/2010_hmp.html (refers to individual island multihazard plans) Source: Kauai Multi-Hazard Mitigation Strategy 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? Source: Hawaii County Multi-Hazard Mitigation Plan 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? Source: Maui County Multi-Hazard Mitigation Plan 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?	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
Economic Vitality			
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.	-2: Decreases ability to move people and products effectively (screen-line volume-to-capacity [V/C] increases by more than 10%). -1: Decreases ability to move people and products effectively (screen-line V/C increases by 10% or less). 0: No impact to movement of people and products. 1: Increases ability to move people and products effectively (screen-line V/C decreases by 10% or less). 2: Increases ability to move people and products effectively (screen-line V/C decreases by more than 10%).	Source: Regional travel demand model V/C ratios at project screen-line locations. Does the solution increase or decrease the ability to effectively move people and goods?	
System Efficiency Management and Operations			
Goal 6.1: Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit.	-2: Does not support the Evaluation Criteria related to access management policies for existing state roadways. -1: No impact to the existing transportation system. 0: Supports one of the three Evaluation Criteria related to access management policies for existing state roadways. 1: Supports two of the three Evaluation Criteria related to access management policies for existing state roadways. 2: Supports all three of the Evaluation Criteria related to access management policies for existing state roadways.	Source: Access Management Manual (Transportation Research Board) Does the solution provide access (or remove access) consistent with access management policies, specifically does it: 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?	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
Transportation Access Mobility			
Goal 7.1: Provide appropriate and reliable transportation access options statewide to all users.	-2: Removes service and/or infrastructure to support access to all modal alternatives (transit, pedestrian, bicycle). -1: Restricts services and/or infrastructure that support access to all modal alternatives (transit, pedestrian, bicycle) for all users. 0: No impacts to the existing land transportation system multimodal access options. 1: Improves existing service and/or infrastructure to support access to all modal alternatives (transit, pedestrian, bicycle). 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.	Source: Hawaii Statewide Pedestrian Master Plan – Existing Bus Route maps (Maps K-2, M-2, H-3) Source: Bike Plan Hawaii – Regional maps Does the solution improve existing transportation access options or provide transportation access options to new geographic areas?	
Goal 7.2: Ensure transportation investments in programs and prioritization processes are balanced across modes and demographics (i.e., serves EJ populations).	-2: Investments do not support infrastructure and access to modal alternatives (transit, pedestrian, bicycle) and do not consider underserved populations. -1: - 0: Not applicable. 1: - 2: Investments support infrastructure and access to modal alternatives (transit, pedestrian, bicycle) with consideration to underserved populations.	Source: American Community Survey (5-year estimates) maps showing percentage of population (by census tract) below poverty level. Source: Hawaii Statewide Pedestrian Master Plan – Existing Bus Route maps (Maps K-2, M-2, H-3) Source: HDOT Guide for Public Involvement (yes/no) Does the solution improve multimodal service to EJ populations? 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?	
Safety			
Goal 8.1: Maintain a safe transportation system for all land transportation modes.	-2: Does not support the Complete Streets principle nor the HSHSP strategic actions listed under the Evaluation Criteria. -1: - 0: Supports either the Complete Streets principle or any of the HSHSP strategic actions listed under the Evaluation Criteria.	Source: Hawaii Complete Streets – Final Complete Streets Legislative Report (November 2010) Does the solution support the following principle listed in the final Complete Streets legislative report? 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.	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
	1: - 2: Supports both the Complete Streets principle and any of the HSHSP strategic actions listed under the Evaluation Criteria.	Source: Hawaii Strategic Highway Safety Plan 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: 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? 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 Does the solution improve existing access or increase access to areas that currently have very few access options?	

TABLE 5
Tier 2 Evaluation Criteria

Goal	Grading	Evaluation Criteria and Data Source	Grade
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.	
Goal 9.3: Provide on-going planning to assess and address statewide needs.	-2: - -1: - 0: Not applicable. 1: - 2: Supports the statewide planning process.		
Goal 9.4: Coordinate use of public right-of-way with other public service providers.	-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.		

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:

(Goal Priority Weight *X* Planning Factor Weight) *X* Evaluation Grade = Goal Rating

Table 6 shows the calculation worksheet.

TABLE 6
Calculation Sheet

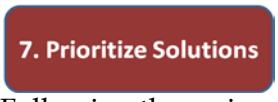
1. Environment and Sustainability		Goal Priority Weight	Planning Factor Weight	Evaluation Grade	Goal Rating
Goal	Goal Description				
1.1	Preserve and enhance the natural environment, including biological and aesthetic resources.				0.000
1.2	Preserve and enhance Hawaii's cultural resources environment, 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**
Goal	Goal Description				
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**
Goal	Goal Description				
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**
Goal	Goal Description				
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**
Goal	Goal Description				
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**
Goal	Goal Description				
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**
Goal	Goal Description				
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**
Goal	Goal Description				
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**
Goal	Goal Description				
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 all 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 Maui.

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.



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 Maui, 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 Maui's federal-aid roadways. The overarching programs and their subprograms are described in Table 7.

Potential solutions for the District of Maui that address priority goals of the Plan, and their correlation to the implementing HDOT Highways Division programs, are described below:

- **Modal integration projects** – Potential modal integration projects include more bicycle lanes, sidewalks, and shared paths exclusively meant for nonmotorized modes. Additional projects include completion of nonmotorized networks, improved, safer connections between different modes of travel, and maintenance and preservation of existing nonmotorized facilities. The existing *Safety Program, System Preservation Program,* and *Capacity Program* include subprograms that implement these types of priority multimodal projects. Improving facilities and increasing safety for users aligns with the Environment and Sustainability, Modal Integration, Safety, and Transportation Access Mobility goals of the Plan.
- **Safety projects** – Solutions identified include infrastructure projects, such as installing warning signage or lighting along roads to increase visibility of all modes, upgrading roadway curves or intersection geometry to address high accident locations and reduce conflicts between modes, or installing guardrail, passing lanes, and wider shoulders. Safety

projects also could include stabilizing embankments to prevent shoreline erosion and providing safe routes to schools. Non-infrastructure projects include enforcement efforts to reduce speeding or distracted driving, and educational campaigns or outreach programs to share the benefits of safe driving. The existing *Safety Program* includes subprograms that implement safety projects. Improving the safety of the District of Maui's roadway infrastructure aligns with the Environment and Sustainability, Safety, and Modal Integration 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, guardrail repairs; sidewalk repairs; vegetation clearing; and drainage and erosion control measures. Maintaining the region's highways aligns with the System Preservation, Security, Safety, and System Efficiency Management and Operations goals of the Plan.
- **Security and resiliency projects –** These projects improve the ability of the district to provide reliable operations during threats, emergencies, or natural disasters. Types of security projects include maintaining existing critical facilities, providing alternate access roads, or addressing climate change and rising sea levels, which is especially important to Maui due to shoreline erosion issues along Honoapiilani Highway. The *Capacity Program, Safety Program,* and *System Preservation Program* have subprograms to prioritize and implement security and resiliency solutions. Providing reliable travel options aligns with the System Preservation, Safety, and Security goals of the Plan.
- **Capacity projects –** Improving efficiency and reducing congestion on Maui's roadways was identified as a priority need. Capacity solutions to address these needs include constructing additional lanes on existing roads, developing by-pass roads to provide circulation options, optimizing traffic signals or access controls, and improving facilities for nonmotorized modes on shared roadways. The existing *Capacity Program* is capable of implementing solutions. Addressing congestion aligns with the Environment and Sustainability, System Preservation, Economic Vitality, and System Efficiency Management and Operations goals of the Plan.
- **Transit projects –**Transit solutions for Maui include increased frequency, expanded service to new areas of the island, transit hubs at key locations, improved sidewalk and bicycle connections to transit stops from residential and commercial areas, and increased amenities for users. Additional infrastructure solutions include new park-and-ride locations and upgraded bus stops and bus shelters. While transit is implemented by the county, some existing HDOT programs, such as 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)	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: • 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. 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 2-3 year before and after accident analysis. Evaluation is submitted annually to FHWA.	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)
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)

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
Guardrail and Shoulder Improvement	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. 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.	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)
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)

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
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)
Drainage Improvements	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. 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 2-3 fiscal years. Potential drainage projects that are not included in the Program are budgeted using other funding sources.	System Preservation (Environment and Sustainability, 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
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)
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 Master Plan.	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)

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
Congestion Programs		
Intelligent Transportation System	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. 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	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)
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)

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
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)
Municipal Separate Storm Sewer System (MS4)	An MS4 permit is acquired on a 5-year timeframe that allows HDOT Highways to discharge storm water 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 Kauai 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 Maui Tier 2 Potential Solutions

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
30	State	Honoapiilani Highway - Maalaea to Launiupoko	Address erosion issues along the highway where the jersey barriers are currently located	Safety
30	State	Honoapiilani Highway, Honolua Bridge	Bridge replacement	System Preservation
30	State	Honoapiilani Highway - west of the Pali to Lahaina	Construct the West Maui Greenway/Honoapiilani Greenway	Capacity
30	State	Kapalua to Lahaina	Construct the West Maui Greenway	Capacity
30	State	Honoapiilani Highway - Front Street to Wahikuli Park	Construct a pedestrian connection	Capacity
30	County	South High Street - Wailuku Elementary School to Koa Drive	Construct sidewalk to connect to existing sidewalk that ends at Koa Drive	Capacity
30	State	Honoapiilani Highway - Maalaea to Lahaina	Pedestrian crossing improvements at pedestrian attractor locations along the highway such as lookout points and parks	Safety
30	State	Honoapiilani Highway - Wailuku to Maalaea	Additional 2 travel lanes	Capacity
30	State	Honoapiilani Highway - Maalaea to Launiupoko	Additional 2 travel lanes	Capacity/System Preservation
30	State	Honoapiilani Highway - Maalaea to Launiupoko	Widen/relocate Honoapiilani Highway inland	System Preservation
30	State	Main Street/High Street Intersection	Traffic signal operational improvements	Congestion
30	State	Honoapiilani Highway - Maalaea to Launiupoko	Rockfall protection	Safety
31	State	Piilani Highway - Mokulele Highway to Wailea-Iki Drive	Pavement resurfacing	System Preservation
31	County	Piilani Highway	Prepare a Piilani Highway roadway management plan which identifies: significant natural and structural features to be preserved; comprehensive road signage requirements; long-term roadway maintenance requirements; and a traffic management system which provides for pull-over spots, and interpretive scenic lookouts	Other
31	State	Piilani Highway - (pinch locations at gulch bridges: north of E Welakahao Road, north of E Waipuilani Road, north of Kulanihakoi Street)	Widen shoulders for bicycle use	Safety
31	State/Developer	Piilani Highway - Kilohana to Wailea	Additional 2 travel lanes	Capacity
31	State	Piilani Highway, at Moi Street intersection	Install advance signing and advance stop bars to warn drivers of the potential presence of pedestrians	Safety
31	State	Piilani Highway extension to Makena	Extend Piilani Highway to the south to Makena	Capacity
32	State	Kaahumanu Avenue/Hana Highway - Lono Avenue to Dairy Road	Construct sidewalks	Capacity
32	State	Kaahumanu Avenue - vicinity of Naniloa Drive overpass	Construct sidewalk to provide pedestrian facility connectivity along Kaahumanu Avenue in the vicinity of the Naniloa Drive overpass	Capacity
32	State	Kaahumanu Avenue - Wharf Street to Kainani Street	Fill sidewalk gaps with the addition of sidewalks or walkways along Kaahumanu Avenue. Develop wayfinding signage for visitors in the area	Capacity

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
32	State	Kaahumanu Avenue	Additional 2 travel lanes with bike lanes, sidewalks, and intersection improvements	Capacity
32	State	Kaahumanu Avenue	Improve pedestrian safety in the vicinity of Baldwin High School	Safety
32	County	Lower Main Street	Construct sidewalks	Capacity
32	County	Lower Main Street - Waena Street to Mill Street	Additional travel lane and provide center turn lane or separate left-turn lanes at major intersections	Capacity
32	State	Main Street/Church Street Intersection	Curb radii modification at the Main Street and Church Street intersection to reduce vehicle speeds around the corners	Safety
36	State	Hana Highway - vicinity of Paia Youth Center	Connect the end of the existing sidewalk on Hana Highway near Paia town to the multi-use trail at Paia Youth Center's parking entrance. Install pedestrian signs at the existing crosswalk	Capacity
36	State	North Shore Bikeway - between Haleakala Highway and Baldwin Avenue	Construct the North Shore Bikeway Phase 4 (close the gap in the existing multi-use path) separate/parallel to Hana Highway	Capacity
36	State	Hana Highway	Prepare a Hana Highway roadway management plan which identifies: significant natural and structural features to be preserved; comprehensive road signage requirements; long-term roadway maintenance requirements; and a traffic management system which provides for pull-over spots, and interpretive scenic lookouts	Other
36	State	Hana Highway - Dairy Road to Baldwin Avenue	Additional 2 travel lanes	Capacity
37	State	Kula Highway, Kaipoioi Stream Bridge	Bridge rehabilitation	System Preservation
37	State	Kula Highway, New Haleakala Highway - Aapueo Parkway to Makawao Avenue and Haleakala Highway - Kula Highway to school entrance	Construct a shared use path or sidewalk	Capacity
37	State	New Haleakala Highway - Old Haleakala Highway to Kula Highway	Additional one lane	Capacity
37	State	Kula Highway - Kula Junction to Pulehu Road	Additional 2 travel lanes	Capacity
37	State	Kula Highway - Pulehu Road to Ulupalakua Road	Signed shared roadway	Capacity
310	State	North Kihei Road, vicinity of Kealia Pond	Beach fill with an elevated dune to minimize wave overwash during seasonal high surf	Safety
310	County	North Kihei Road	Provide safe and maintained access to the MECO power plant facility	System Preservation
310	County	North Kihei Road	Realign/relocate the highway behind power plant	System Preservation
311	State	Mokulele Highway - Kuihelani Highway to Piilani Highway	Additional 2 travel lanes	Capacity
340	State/County	Kahekili Highway - Kapalua to Wailuku	Safety improvements: resurfacing, realignment, widening, rockfall protection, guardrail, maintenance of vegetation	Safety
340	State	Kahekili Highway - Waiehu Beach Road to Waihee Valley Road	Additional one travel lane and improve highway operations	Congestion

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
360	State	Hana Highway, Kopiliula Stream Bridge	Rehab/replace existing bridge	System Preservation
360	State	Hana Highway - Kailua to Keanae	Adjacent to Nuaailua Bay, install landslide protection and replace guardrails	Safety
360	State	Hana Highway, Mokulehua Stream Bridge	Rehab/replace existing bridge	System Preservation
360	State	Route 360, Hana Highway, Kapaula Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Route 360, Hana Highway, Makanali Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Route 360, Hana Highway, Makapipi Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Route 360, Hana Highway, Punalau (Kolea) Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Route 360, Hana Highway, Puohokamoa Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Route 360, Hana Highway, Ulaino Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Route 360, Hana Highway, Heleleikeoha Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Route 360, Hana Highway, Kailua Stream Bridge	Bridge rehabilitation	System Preservation
360	State	Kamehameha V Highway, east of Morris Point	Upgrade highway to current standards: widen lanes and shoulders	System Preservation
360	State	Hana Highway	Improve Hana Highway to allow safe passage of two-way vehicular traffic	Capacity
365	County	Makawao Avenue - Eddie Tam Gym to Baldwin Avenue	Makawao Avenue-Makani Road (Route 3630) Improvements Phase II: Resurfacing and widening improvements from Eddie Tam Gym to Baldwin Avenue	System Preservation
365	County	Kaupakalua Road - Hana Highway to Makawao Avenue	Resurface Kaupakalua Road	System Preservation
365	County	Makawao Avenue and Makani Road Intersection	Improve pedestrian crossing for school children	Safety
365	County	Makawao Avenue - Baldwin Avenue to Makalani Place	Construct continuous sidewalk (fill current sidewalk gap)	Capacity
365	County	Makawao Avenue - Kokomo Road to Makani Road	Signed shared roadway	Capacity
365	County	Makawao Avenue and Olinda Road intersection	Intersection safety improvements	Safety
366	County	Haiku Road and Kokomo Road at Haiku Canary	Construct sidewalks and improve drainage. Improve the intersection operations and signing	Safety
371	County	Haliimaile Road - Haleakala Highway to Baldwin Avenue	Upkeep roadway maintenance	System Preservation
377	State	Haleakala Highway - Kealoha Avenue to National Park	Signed shared roadway (part of the Upcountry to Paia connection)	Capacity
380	State	Kuihelani Highway - Puunene Avenue to Honoapiilani Highway	Construct continuous bicycle facilities (path and Signed shared roadway)	Capacity
380	State	Dairy Road - Keolani Place to Puunene Avenue	Signed shared roadway	Capacity
380	State	Dairy Road - Keolani Place to Puunene Avenue and Puunene Avenue - Dairy Road to Puukane Street	Construct sidewalk (connect the existing pedestrian path on Puunene Avenue to the commercial areas on Dairy Road)	Capacity
390	County	Baldwin Avenue - Hana Highway to Makawao Avenue	Pavement reconstruction	System Preservation

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
390	County	Baldwin Avenue - Hana Highway to Makawao Avenue	Construct signed shared roadway and sidewalks along the corridor (part of the Upcountry to Paia connection)	Capacity
390	County	Baldwin Avenue - Hana Highway to Makawao Avenue	Bike pullouts with bike resting stations or stopping areas for bike riders	Safety
442	State	Kaumalapau Highway - Lanai Airport to Lanai Avenue	Signed shared road	Capacity
450	State	Kamehameha V Highway, Makakupaia Stream Bridge	Bridge rehabilitation or replacement	System Preservation
450	State	Kamehameha V Highway at Kamalo	Drainage improvements to accommodate surface runoff from the existing ford	System Preservation
450	State	Kamehameha V Highway at Kaunakakai Stream	Drainage improvements to accommodate surface runoff from gulches/low-water crossings	System Preservation
450	State	Kamehameha V Highway just west of Kaluaaha	Drainage improvements to accommodate surface runoff from gulches/low-water crossings	System Preservation
450	State	Kamehameha V Highway near Pukoo	Drainage improvements to accommodate surface runoff from the existing ford	System Preservation
450	State	Kamehameha V Highway near Ualapue (~13.2 miles east of Kaunakakai Town)	Drainage improvements to accommodate surface runoff from the existing ford	System Preservation
450	State	Kamehameha V Highway, vicinity of Niaupala Fishpond	Construct a revetment for the reconstruction and protection of the highway shoulder	System Preservation
450	State	Kamehameha V Highway, Ohia Bridge	Bridge rehabilitation	System Preservation
450	State	Kamehameha V Highway, Kamiloloa Stream Bridge	Bridge rehabilitation	System Preservation
450	State	Kamehameha V Highway, Route 450, Mapulehu Bridge	Bridge Rehabilitation	System Preservation
450	County	Kamehameha V Highway	Perform a study to identify alternative emergency access to communities along Kamehameha V Highway on the east side of Molokai	Other
450	State	Kamehameha V Highway - Kalae Highway to Mile 8 Marker and from Mile 8 Marker to Mile 10 Marker	Signed shared roadway	Capacity
450	State	Kamehameha V Highway	Signed shared roadway	Capacity
450	State	Kamehameha V Highway at Kaunakakai	Install guardrail	Safety
450	State	Kamehameha V Highway and Maunaloa Highway	Install emergency call boxes	Other
460	State	Maunaloa Highway - Kalae Highway to Ala Malama Avenue	Widen highway to include 12-foot lanes and 6-foot shoulders in both directions of travel	Safety
460	State	Maunaloa Highway - Kalae Highway to Maunaloa Village	Signed shared roadway	Capacity
460	State	Maunaloa Highway/Kamehameha V Highway/Ala Malama Avenue/Kaunakakai Place intersection	Construct a modern roundabout	Congestion
460	State	Maunaloa Highway	Resurface highway	System Preservation
460	State	Maunaloa Highway at Kalae Highway intersection	Provide exclusive left-turn lane and median left turn merge lane to facilitate the left-turn movements to and from Kalae Highway	Safety

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
470	State	Kalae Highway	Signed shared roadway	Capacity
480	State	Farrington Avenue - Kalae Highway to Molokai High School	Construct a dedicated pedestrian facility for kids to walk to school	Safety
480	State	Farrington Avenue - Kalae Highway to Puupeelua Avenue	Signed shared roadway	Capacity
480	County	Puupeelua Avenue	Signed shared roadway	Capacity
3000	State	Honoapiilani Highway (Lahaina Bypass) 1B2 - Hokiokio Place to southern terminus	Construct a new 2-lane bypass roadway between Hokiokio Place and southern terminus on Honoapiilani Highway	Capacity
3000	State	Honoapiilani Highway (Lahaina Bypass) Phase 1C - Keawe Street Extension to Kaanapali Connector	Construct a new 2-lane bypass roadway between and Keawe Street and Kaanapali Connector	Capacity
3000	State	Honoapiilani Highway (Lahaina Bypass) Phase 1D - Kaanapali Connector to northern terminus	Construct a new 2-lane bypass roadway between Kaanapali Connector and northern terminus on Honoapiilani Highway	Capacity
3040	County	Lahainaluna Road	Capacity and safety improvements	Safety
3080	County	Lower Honoapiilani Road - Hoohui Road to Napilihau Road	New sidewalks and resurfacing	Capacity
3100	County	South Kihei Road	Pavement rehabilitation	System Preservation
3100	County	South Kihei Road - Kaonoulu Street	Address shoreline erosion	Safety
3100	County	South Kihei Road Bridges	Rebuild bridges across gulches - near Kaonoulu and Kulani Hakoi Streets	System Preservation
3100	County	South Kihei Road	Signal modernization	System Preservation
3100	County	South Kihei Road from Longs Drugs (Piikea Avenue) to Lipoa Street	Additional 2 travel lanes with continuous left turn lane	Capacity
3100	County	South Kihei Road - Kulanihakoi Street to Okolani Drive	Build a consistent/continuous bike lane	Capacity
3100	County	South Kihei Road - Ohukai Road to Mokulele Highway	Signed shared roadway	Capacity
3100	County	South Kihei Road - Uwapo Road to Okolani Drive	Sidewalk connectivity through the corridor	Capacity
3115	County	North-South Collector Road - Uwapo to Wailea-Iki Drive	Complete a 2-lane north-south collector roadway (parallel to Piilani Highway) from Uwapo Road to Wailea-Iki Drive	Capacity
3150	County	East Welakahao Road - South Kihei Road to Piilani Highway	Signed shared roadway	Capacity
3180	County	Waiale Road	Road maintenance	System Preservation
3180	County	Waiale Road - Kaahumanu Avenue to Honoapiilani Highway	Additional 2 travel lanes between Kaahumanu Avenue and Kuikahi Drive, extend from current terminus as 2-lane bypass road around Waikapu Village	Capacity
3180	County	Waiale Road - Kuikahi Drive to Wells Street	Construct sidewalks for pedestrian safety	Safety
3185	County	Waiko Road - Kuihelani Highway to Waiale Road	Improve Waiko Road from Honoapiilani Highway to Kuihelani Highway, with two travel lanes, paved shoulders and drainage improvements	System Preservation
3190	County	Ohukai Road - South Kihei Road to Piilani Highway	Signed shared roadway	Capacity
3231	County	Waiinu/Waiale Road/Waiinu Road intersection	Conduct traffic analysis and traffic signal warrants	Congestion

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
3400	State	Kahului Beach Road	Signed shared roadway	Capacity
3400	State	Waiehu Beach Road - between Hawaiian Homes and Sack N Save	Fix sidewalk gaps	Safety
3400	State	Kahului Beach Road	Modify traffic signal and intersection traffic control to improve system efficiency. Apply access management along corridor	Congestion
3405	County	North Market Street - Kaahumanu Avenue to Mill Street	Construct sidewalks	Capacity
3700	County	Piilani Highway	Improve Piilani Highway as an alternative route to Hana while protecting and preserving the integrity of natural landforms and historic structures	System Preservation
3800	State (Highways/ Airports)	Kahului Airport Access Road - Hana Highway to Kahului Airport	Construct Phase 2 of the new airport access road	Capacity
3830	County	Lower Main Street	Pavement rehabilitation	System Preservation
3910	County	Papa Avenue - Kamehameha Avenue to Laau Street	Construct bike lanes	Capacity
3910	County	Papa Avenue - Puunene Avenue to Hina Avenue	Construct bike lanes	Capacity
3920	County	Wakea Avenue - Kaahumanu Avenue to Hana Highway	Construct continuous bicycle lanes	Capacity
3930	County	Hina Avenue - Wakea Avenue to Papa Avenue	Construct continuous bicycle lanes	Capacity
3940	County	Kamehameha Avenue - Maui Lani Parkway to Hana Highway	Construct continuous bicycle facilities	Capacity
3940	County	Kamehameha Avenue/Kane Street	Perform signal warrants and develop intersection improvements for vehicle, pedestrian and bicycle safety	Congestion
3940	County	South Kamehameha Avenue/Maui Lani Parkway intersection	Conduct traffic analysis and traffic signal warrants	Congestion
3950	County	Lono Avenue - Kaahumanu Avenue to Kamehameha Avenue	Construct bike lanes	Capacity
3950	County	Lono Avenue - Papa Avenue to Laau Street	Construct bike lanes	Capacity
3960	County	Onehee Avenue - Wakea Avenue to Papa Avenue	Construct bike lanes	Capacity
N/A	State	Roadway pavement	Roadway rehabilitation, resurfacing , reconstruction and preventive maintenance	System Preservation
N/A	State	Shoreline erosion control	Protect bridge supports and roadway embankments from shoreline erosion	System Preservation
N/A	County	Makena Road - near the southern terminus	Address shoreline erosion - for areas that are adjacent to the shoreline	Safety
N/A	County	Kahului area	Resurface Kamehameha Avenue, Lono Avenue, Wakea Avenue, Hina Avenue	System Preservation
N/A	State	Regionwide Sidewalk Repair	Repair sidewalks	System Preservation
N/A	State/County	Regionwide paving and striping	Continue to improve paving and striping material quality and lifespan	System Preservation
N/A	State	Piilani Highway - Muolea to Waiopae	Rockfall protection	Safety
N/A	State	Regionwide guardrail and shoulder improvement		Safety
N/A	State	Traffic signal upgrade	Replace traffic signal hardware and modernize	Congestion

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
N/A	State	Signature structures	Upgrade/repair/replace signage structures	System Preservation
N/A	Federal Grant Program/ County Applicant - SRTS	Safe Routes to School (SRTS) projects	Implement or support SRTS projects	Safety
N/A	County	Kihei Mauka Bypass - Mokulele Highway to Kanani Road	Additional 4 travel lanes between Mokulele Highway (north of N. Kihei Road) and Kanani Road, realign N. Kihei road to new intersection	Capacity
N/A	State	Paia Relief Route	Improve Hana Highway or construct a new 2-lane bypass roadway around Paia	Capacity
N/A	County	General vicinities of Kapalua Airport/Napili-Honokowai area and Kaanapali area	Need evacuation routes	Other
N/A	County	Sidewalk Study	Develop a long term plan for sidewalks (inventory, planning, community consultation)	Other
N/A	County	Kihei Greenway - Kaonolulu Street to East Waipulani Road and from East Lipoa Street to Kilohana Drive	Construct a shared use path	Capacity
N/A	County	Maui Lani Parkway Extension - Puumele Street to Kuikahi Drive	Extend Maui Lani Parkway from Puumele Street to Kuikahi Drive Extension	Capacity
N/A	County	Mill Street Extension - Lahainaluna Road to Aholo Road	Extend Mill Street from Lahainaluna Road to Aholo Road	Capacity
N/A	State	Kihei to Upcountry connector - Piilani Highway to Haleakala Highway	Additional 2 travel lanes between Piilani Highway at Kaonoulu Street to Haleakala Highway at Haliimaile Road	Capacity
N/A	County	Maui Lani Parkway Extension - Kuihelani Highway to Mokulele Highway	Extend Maui Lani Parkway to bypass Puunene Avenue and connect to Mokulele Highway	Capacity
N/A	County	Regionwide intra/inter-island commuter ferry		Other
N/A	County	Hanamu Road and Olinda Road	Signed shared roadway (part of the Upcountry to Paia connection)	Capacity
N/A	County	Wailuku area	Address sidewalk gaps identified by the Wailuku Walkability study	Capacity
N/A	State	Manele Road	Widen shoulders and construct pullout areas	Safety
N/A	County	Onehee Avenue - existing terminus to proposed Maui Lani Parkway Extension	Extend Onehee Avenue with sidewalks to proposed Maui Lani Parkway Extension	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	County	Transportation Demand Management	Develop an appropriate Transportation Demand Management Program	Congestion
N/A	County	Transportation System Management	Develop an appropriate Transportation System Management Program	Congestion
N/A	State/County	Islandwide High Occupancy Vehicle Lanes study	Study feasibility of High Occupancy Vehicle lanes with or adjacent to major arterials	Other
N/A	County	Public-Private Partnership	Explore/study potential public-private partnership opportunities for alternative modes of transportation	Other

Maui District Tier 2 Roadway Infratructure Potential Solutions

Route Number	Jurisdiction	Project Title	Project Description	Primary Program
N/A	County	School sites near Paukukalo, Wailuku	Speed feedback monitors at school sites	Safety
N/A	County	Kahului Sub-area Circulation Study	Conduct a circulation study in Kahului	Other
N/A	County	Enforcement	Support enforcement efforts (stings) related to speeding	Safety
N/A	County	Wailuku Sub-area Circulation Study	Conduct a circulation study in Wailuku	Other

Maui District Tier 2 Transit Services and Operations Potential Solutions

Jurisdiction	Project Description	Primary Program
County	Upgrade bus stops along Makawao Avenue between Baldwin Avenue and Makalani Place	Congestion
County	Construct the Central Maui Transit Facility Center in Wailuku/Kahului area	Congestion
County	Purchase buses and operate bus transit facilities	Congestion
County	Transit equipment and operations, FTA Section 5311, Rural Bus Program	Congestion
County	Construct an electric train system	Congestion
County	Improve bus service in Paia town and Upcountry	Congestion
County	Develop more Park & Rides	Congestion
County	Designate, map and develop corridors to support mass transit solutions	Congestion
County	Provide more bus service	Congestion
County	Shuttle service (MEO) or reliable bus system to Kaunakakai (to serve the elderly and non-drivers, provide access to clinics, banks etc.) Provide service for tourists between Kaunakakai Harbor, airport and Maunaloa	Congestion
County	Islandwide Public Transit System Expansion - Kahului Airport to Kapalua - within Lahaina Town w/Park-n-Ride - along Makawao Avenue (Makawao to Huelo) - commuter mass transit from Kahului to Kula - hub at airport - connect bus to airport on Mokulele - along Haleakala Highway - expansion to Waihee	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

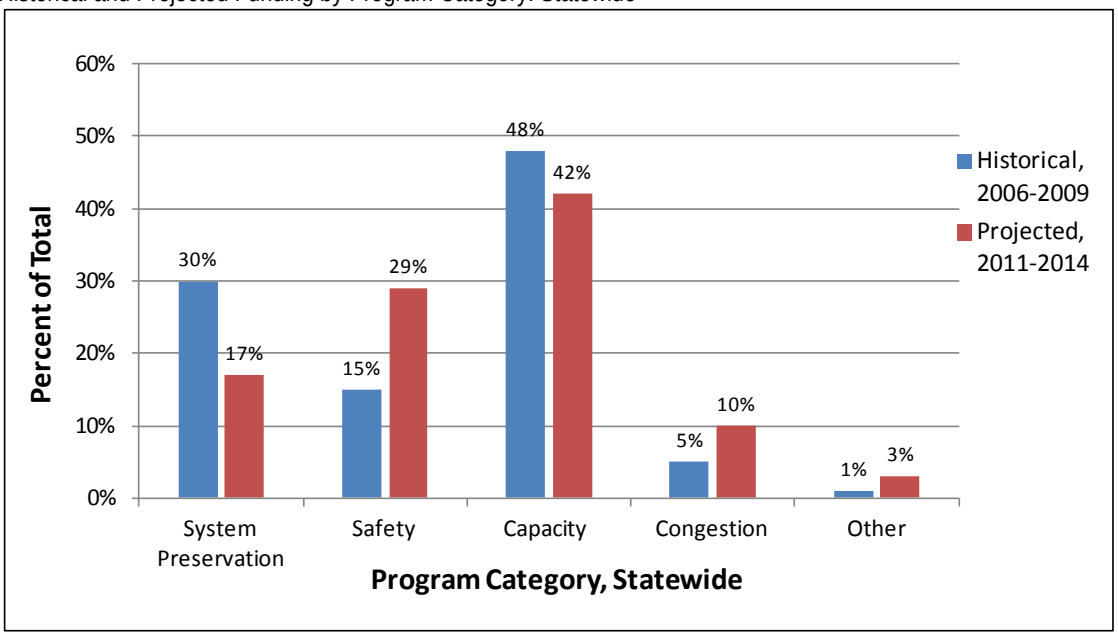
focuses on upgrading existing transportation infrastructure to current environmental and safety requirements through industry best practices.

- **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

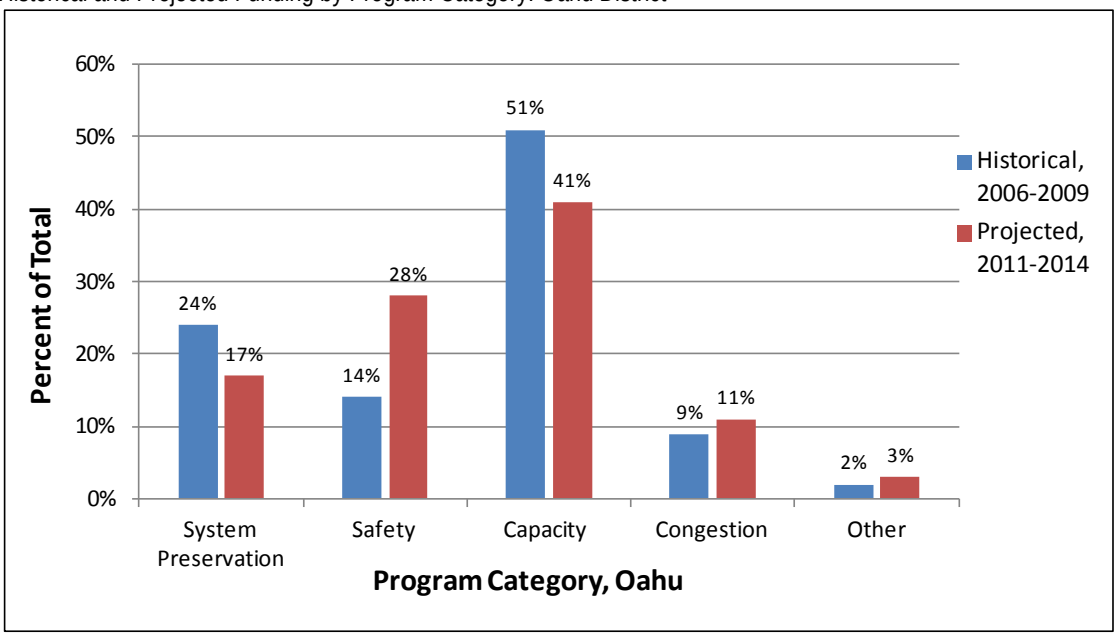


Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

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 Kalanianaole Highways, H-1 guardrail/shoulder improvements, and Highway Safety Improvement Program improvements.

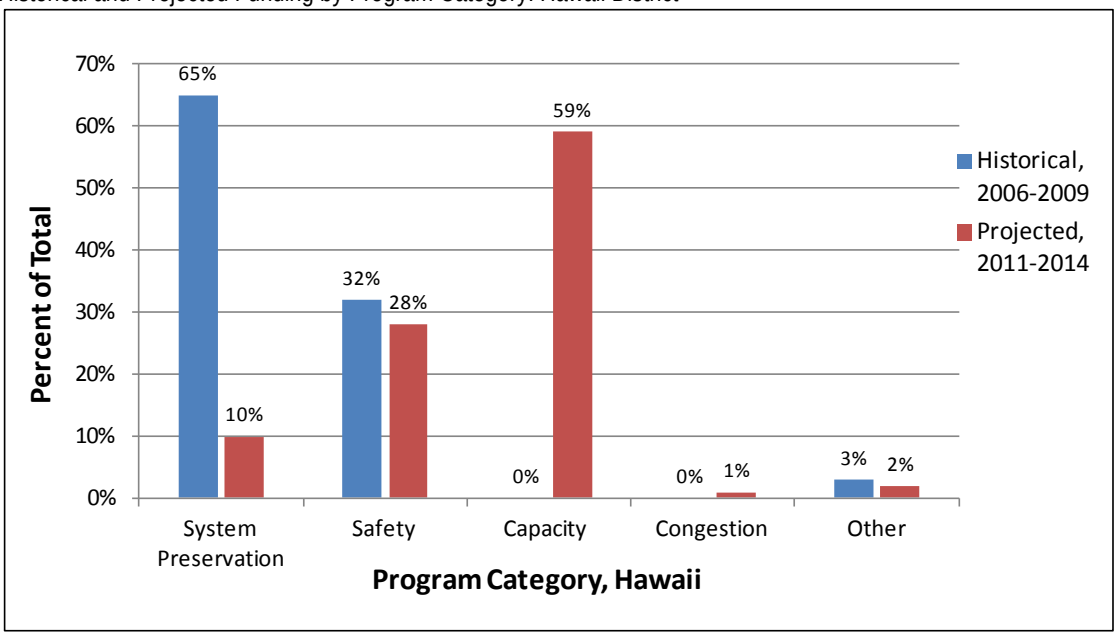
EXHIBIT 2
Historical and Projected Funding by Program Category: Oahu District



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

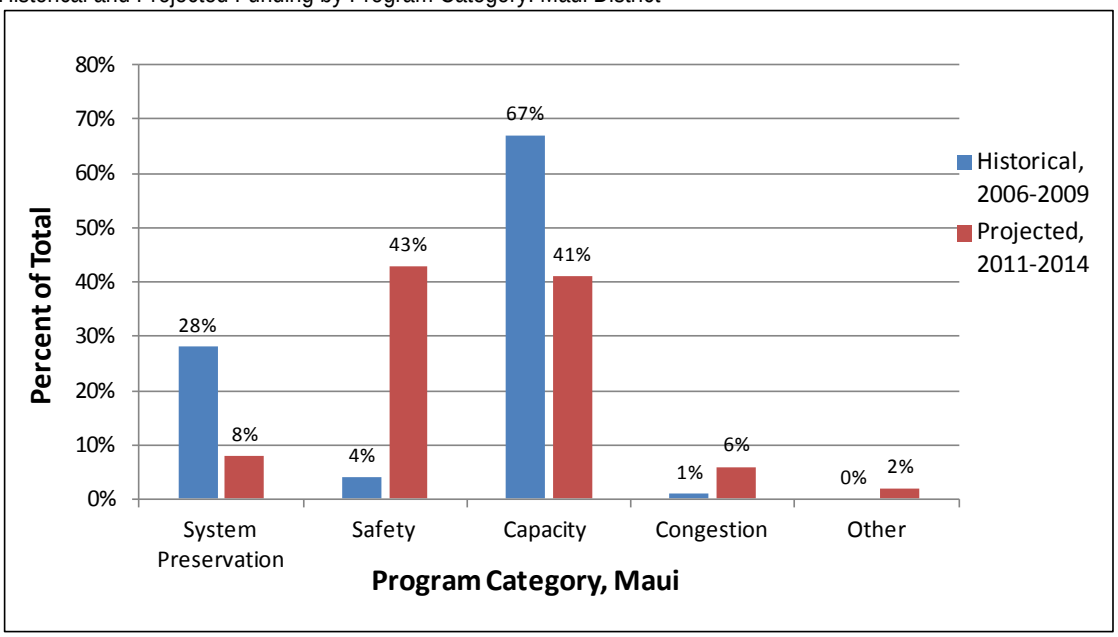


Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

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



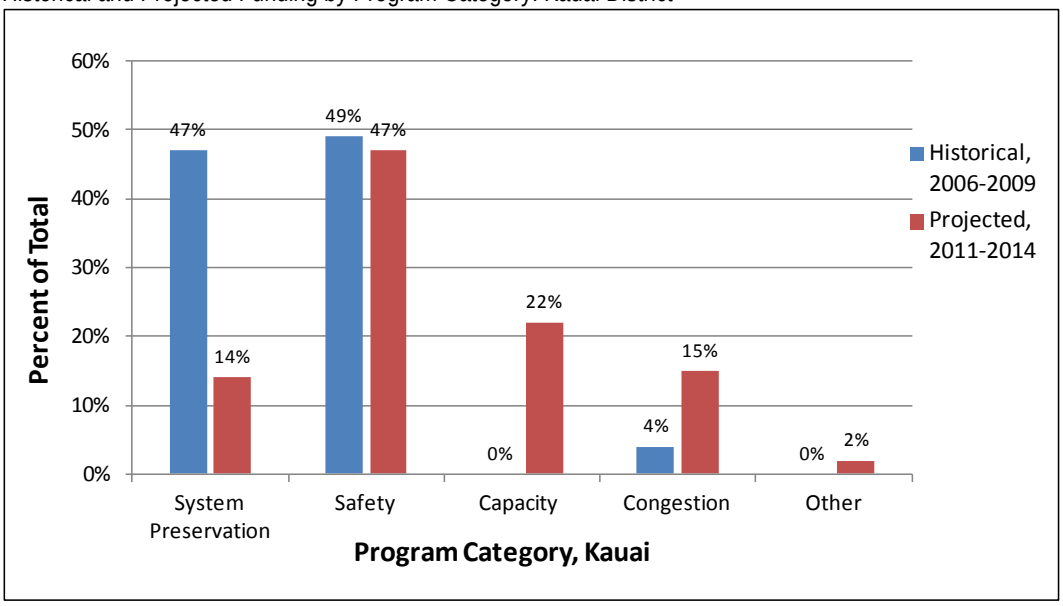
Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

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.

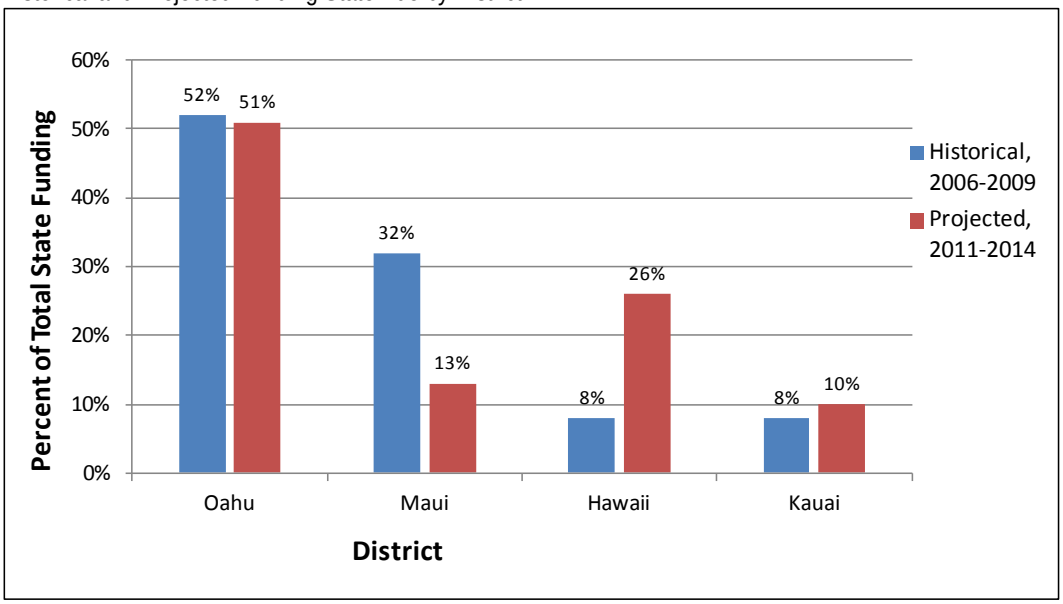
EXHIBIT 5
Historical and Projected Funding by Program Category: Kauai District



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.

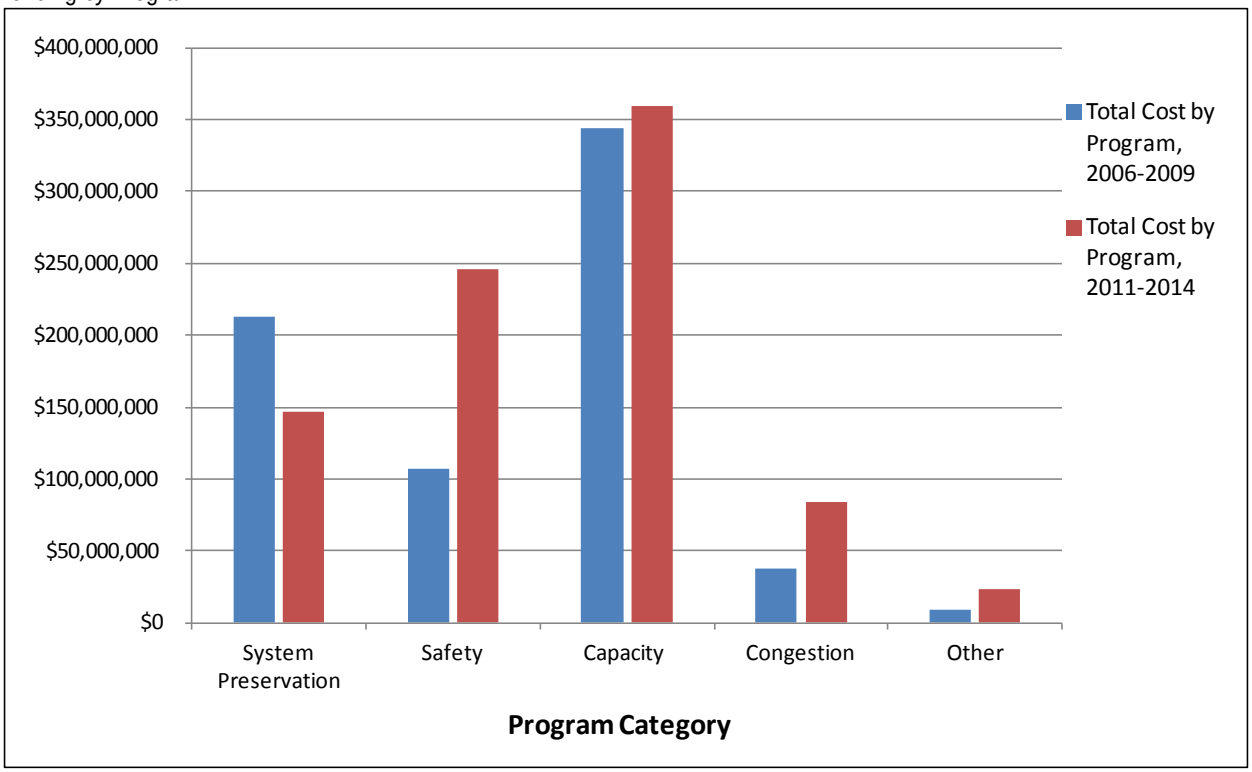
EXHIBIT 6
Historical and Projected Funding Statewide by District



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.

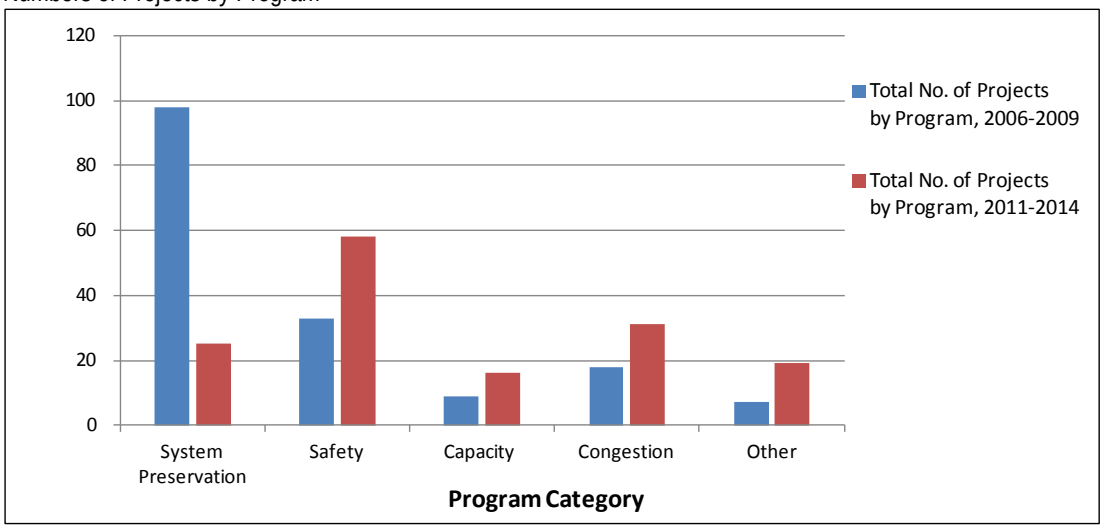
EXHIBIT 7
Funding by Program



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

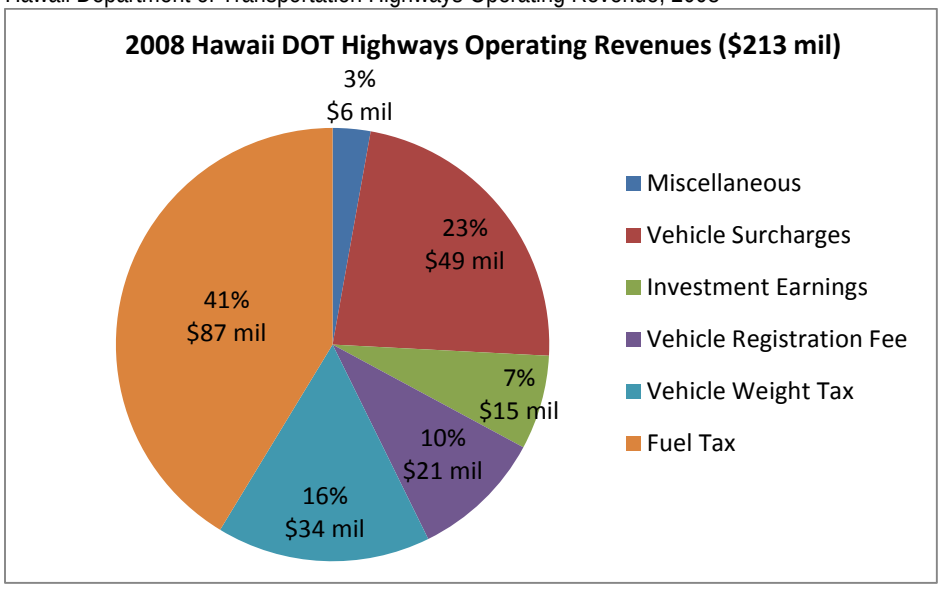


Source: FFY 2006-2009 Hawaii Department of Transportation Contracts Log.
FFY 2011-2014 Hawaii Department of Transportation Statewide Transportation Improvement Program September 1, 2010.

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.

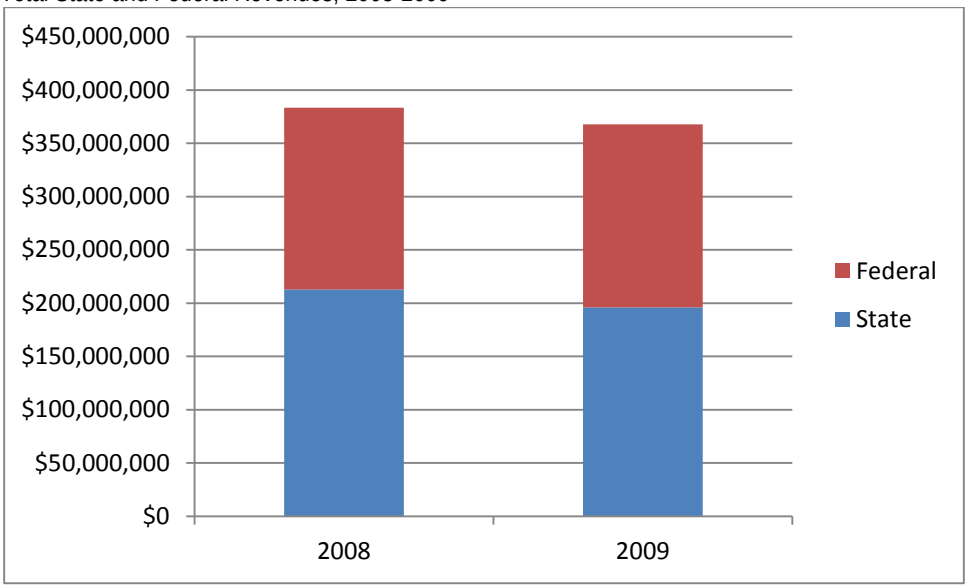
EXHIBIT 10
Federal Highway Administration Funding, 2006-2009

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.

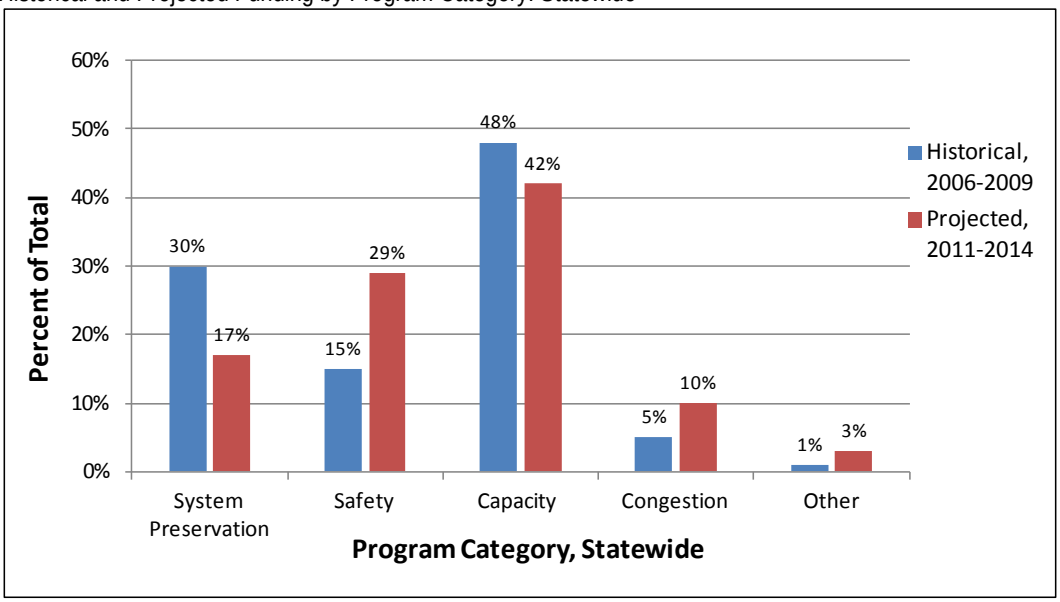
Historical revenue was also summarized to identify the level of contribution for various state and federal revenues that fund the HDOT Highways Division's programs. Land transportation projects are implemented through one of the following overarching HDOT Highways programs:

- **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.

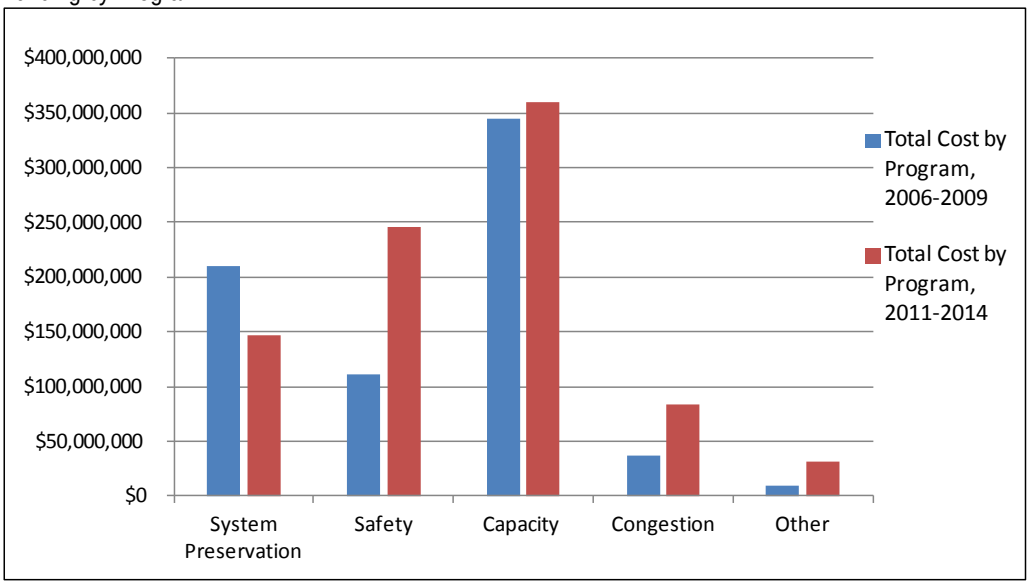
FIGURE 1
Historical and Projected Funding by Program Category: Statewide



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.

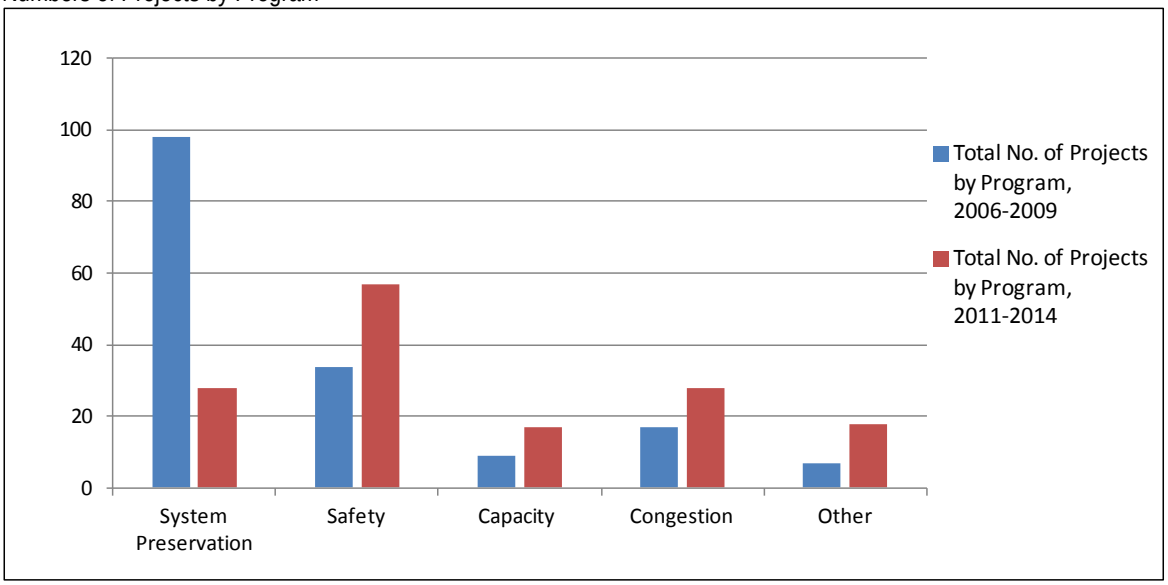
FIGURE 2
Funding by Program



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	• 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	• Encourage Complete Streets • Construct new bicycle lanes and sidewalks • Provide lights, pavements markers, signage	Capacity, Safety
Provide emergency access and improve resiliency	• Construct alternate routes or bypass roads • Reinforce critical lifeline facilities • Relocate roads away from shoreline	Capacity
Improve and expand transit service	• 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	• 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.

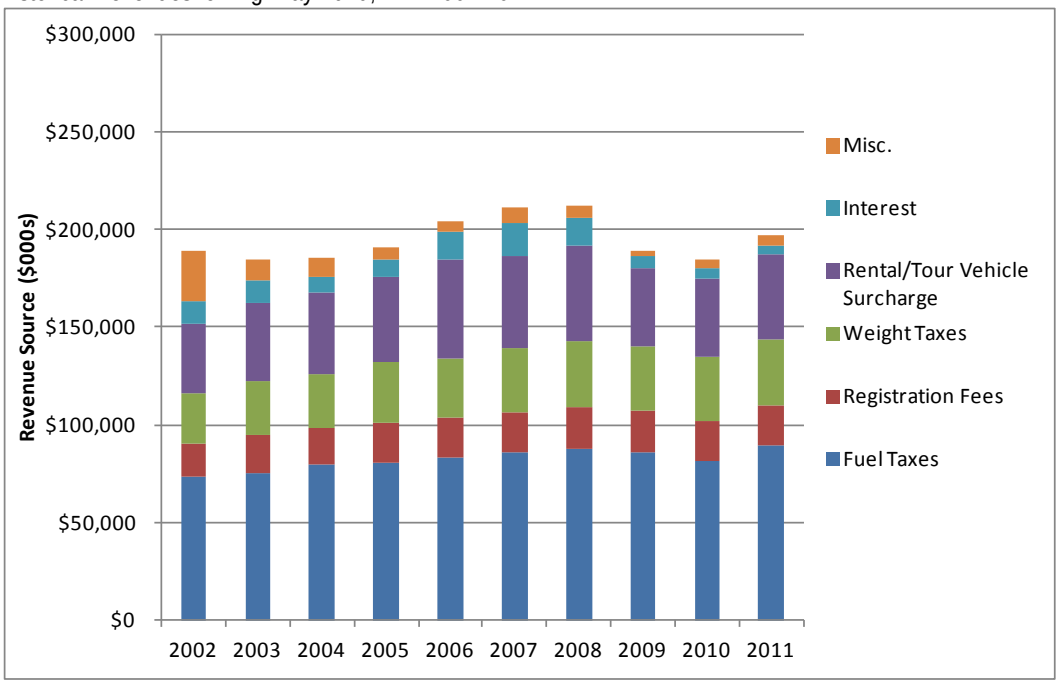
State Funding

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.

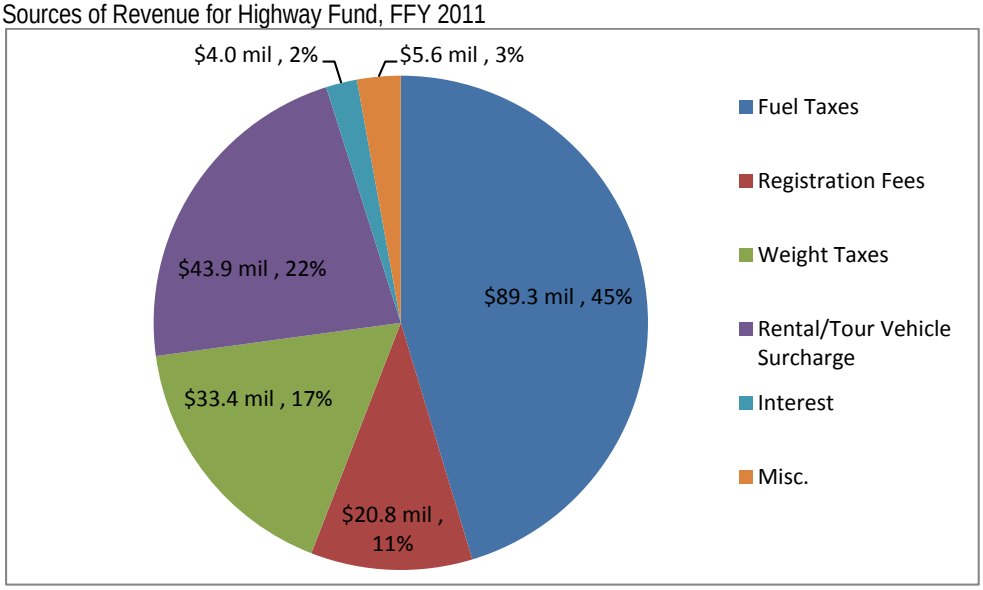
FIGURE 11
Historical Revenues for Highway Fund, FFY 2002-2011



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

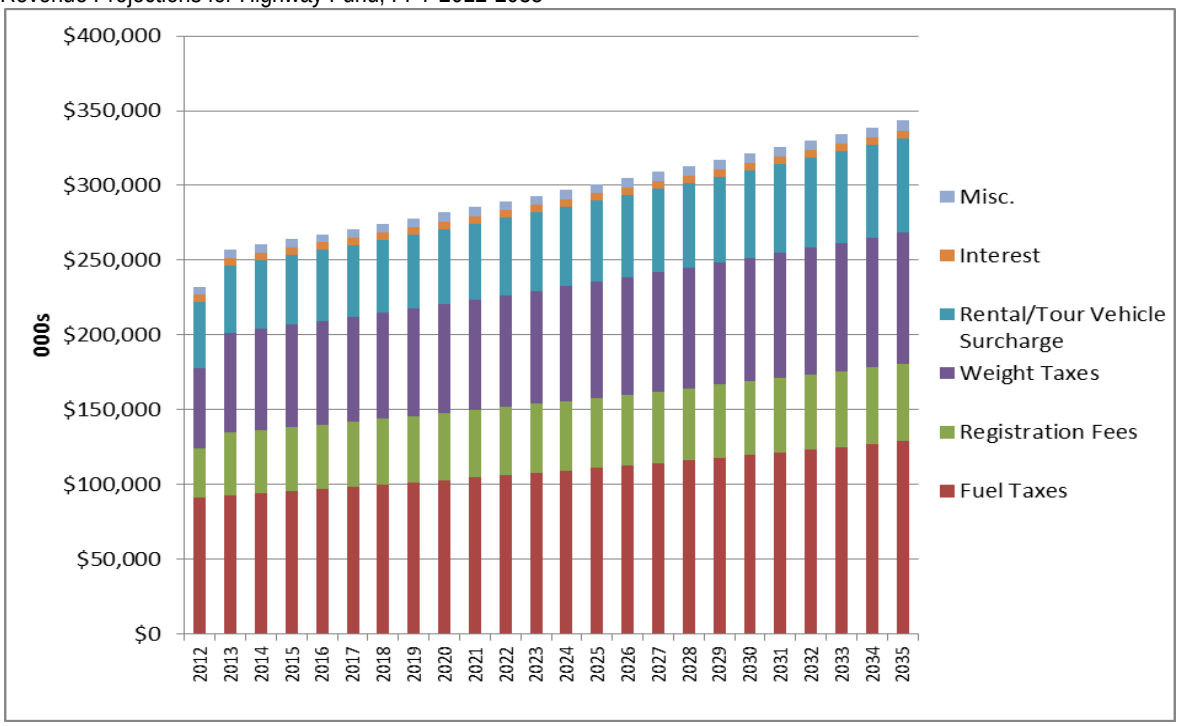
Figure 13 presents projected revenues from state sources from 2012 through 2035. Compared to the operating revenue of just under $200 million in 2011, revenues increased in 2012 to approximately $232 million. This was due to an increase in the weight tax, which generated

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).

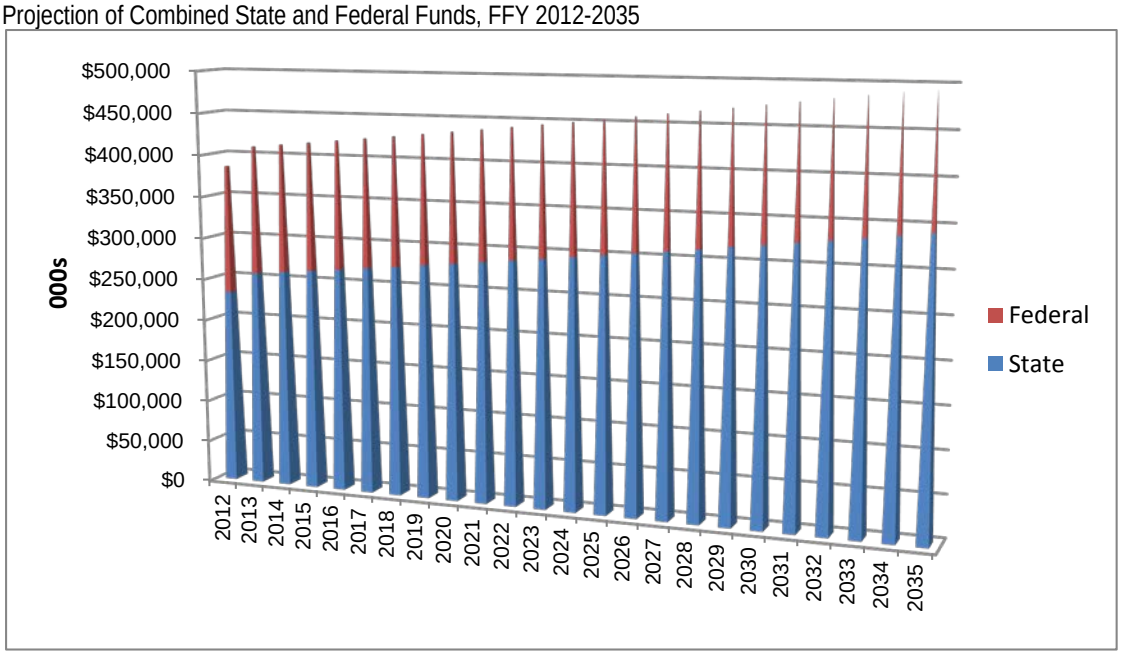
FIGURE 13
Revenue Projections for Highway Fund, FFY 2012-2035



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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