
# KIHEI SUB-AREA TRANSPORTATION PLAN

## DRAFT REPORT

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PREPARED FOR:
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## Appendixes



## Exhibits

# Acronyms and Abbreviations

| | |
|---|---|
| % | percent |
| AACE | Association for the Advancement of Cost Engineering |
| AASHTO | American Association of State Highway and Transportation Officials |
| BUILD | Better Utilizing Investments to Leverage Development [Transportation Discretionary Grants program] |
| CAC | Citizen Advisory Committee |
| CEQ | Council on Environmental Quality |
| CIP | capital improvement program |
| County | County of Maui |
| CSS | context sensitive solutions |
| DBEDT | State of Hawaii Department of Business, Economic Development & Tourism |
| DOD | Department of Defense |
| DPW | Department of Public Works |
| EA | environmental assessment |
| EIS | environmental impact statement |
| FAST Act | Fixing America's Surface Transportation Act |
| FD | federal funds |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FIRM | Flood Insurance Rate Map |
| FY | fiscal year |
| GAN | Grant Anticipation Note |
| GARVEE | Grant Anticipation Revenue Vehicle |
| GB | General Obligation Bond |
| GIS | geographic information system |
| HAR | Hawaii Administrative Rules |
| HDOT | State of Hawaii Department of Transportation |
| HF | Highway Fund |
| HiRUC | Hawaii Road Usage Charge [demonstration project] |
| HRS | Hawaii Revised Statutes |
| HSIP | Highway Safety Improvement Program |
| INFRA | Infrastructure for Rebuilding America [grants] |
| LOS | level of service |

| | |
|---|---|
| *makai* | oceanward |
| MAP-21 | Moving Ahead for Progress in the 21st Century Act |
| *mauka* | mountainward |
| MEO | Maui Economic Opportunity, Inc. |
| MPO | Metropolitan Planning Organization |
| NHS | National Highway System |
| PEL | planning and environmental linkage |
| Plan | Kihei Sub-area Transportation Plan |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users |
| SHPD | State Historic Preservation Division |
| SLH | Session Laws of Hawaii |
| STIP | Statewide Transportation Improvement Program |
| TAC | Technical Advisory Committee |
| TAZ | traffic analysis zone |
| TDR | transfer of development rights |
| TIP | Transportation Improvement Program |
| U.S.C. | United States Code |
| UH-SOEST | University of Hawaii School of Ocean and Earth Science and Technology |
| V/C | volume to capacity |
| VFW | Veterans of Foreign Wars |
| VMT | vehicle miles traveled |

The Kihei Sub-area Transportation Plan assesses existing transportation issues in the Kihei area and identifies potential solutions.

# Introduction and Overview

Chapter 1

Kihei is one of the fastest growing urban areas within the rapidly growing Maui District: By 2035, the population on Maui is expected to grow by over 40 percent, notably in the Kihei-Makena and Wailuku-Kahului areas. The growing population, commercial activities, and businesses are placing increased demands on Kihei's transportation infrastructure. The County of Maui (County) conducted a transportation study of the Kihei area, working with agencies and community stakeholders to develop a program of improvements to optimize the transportation system for users across all modes of travel.

During the development of the District of Maui's *Federal-Aid Highways 2035 Transportation Plan,* it became apparent that the projected population growth in Kihei will outpace infrastructure needs and that a more focused sub-area plan for Kihei is needed. The Kihei Sub-area Transportation Plan (Plan) assesses existing transportation issues in Kihei in a more focused manner and identifies potential solutions to address the identified issues within the study area. This document explains the process used to develop recommendations for near- to long-term solutions to address mobility needs and congestion for all modes of transportation in the Kihei area, and includes prioritized recommendations paired with estimated costs, implementation strategies, and performance metrics.

The study area extends from the shoreline to the mountainward (*mauka*) urban growth boundary identified in the *Maui Island Plan*. The northern extent of the study area is bounded by the intersection of North Kihei Road and Piilani Highway. The Plan's southern boundary is formed by Kilohana Drive (**Exhibit 1-1**).

## Plan Breakdown

This document is made up of the following chapters:

- ***Introduction and Overview*** – A description of the Kihei Sub-area Transportation Plan, its purpose, and its development process.
- ***Goals and Objectives*** – A summary of the goals and objectives for the Plan, their purpose, and how they helped identify priorities.
- ***Existing Context and Conditions*** – A description of existing land use and transportation in the Kihei area.
- ***Solutions and Recommendations*** – A listing of prioritized recommendations, including project descriptions and estimated costs.
- ***Implementation*** – An outline of implementation strategies (that is, funding, design, and construction) for key prioritized projects, and a description of how Plan effectiveness will be measured over time.
- ***References*** – A listing of information and supporting documents evaluated during preparation of the work.

Exhibit 1-1. Kihei Sub-area Transportation Plan Area


## 1.1 Plan Purpose

The purpose of the Plan is to develop transportation solutions to address mobility needs and congestion for all modes of transportation in the Kihei area and serve as a policy and implementation guide for improving Kihei's multimodal transportation system. The Plan is intended to develop a policy framework and investment strategy that meets the current and future travel needs of the community based on an assessment of Kihei's transportation assets, needs, and opportunities, while including the following:

- A balanced approach for assessing Kihei's transportation system that considers both technical data and community input.
- An assessment that considers the existing conditions of the transportation system as well as planned and future development projects proposed in Kihei.
- An evaluation of potential solutions according to a balanced set of criteria.
- A prioritized list of improvement projects that can be included in the Statewide Transportation Improvement Program, Maui Transportation Improvement Plan, and County Capital Improvement Program.
- A data-driven approach that meets the requirements of Federal-aid funding.
- A plan that includes solutions that can be implemented in different timeframes, from actions that can be undertaken in the near term to those that require more extensive planning and design; this range of solutions would address mobility and safety needs through the year 2035.

This Plan includes the Federal-aid highways, which are those roads comprising the National Highway System (NHS) and other public roads except those federally classified as local roads or rural minor collectors. These roads are eligible for federal funding and are critical for regional mobility and include linkages among major sites (such as airports, harbors, industrial areas, major communities, and primary urban centers). They provide support for commuter and freight travel. Federal classification of roadways is based on criteria established by the Federal Highway Administration (FHWA). Functional classification describes the desired characteristics of roadways and is used for planning, design, budgeting, programming, and fiscal management. Exhibit 1-2 shows the federal functional classification of roadways in the Kihei area.

This Plan is led by the County and supported by the State of Hawaii Department of Transportation (HDOT) and the Federal Highway Administration (FHWA). The County recognizes that the Kihei area transportation system must be looked at as a whole for this effort to be most effective. Improvements to county roads in this area could help relieve congestion on state highways and make the transportation system safer overall. The County and the HDOT desire to move forward together to prioritize requests for federal funding in a way that fits with state and local needs (including those documented during

previous planning studies) and is financially feasible and competitive for existing funding programs.

## 1.2 Plan Development Process

The Kihei Sub-area Transportation Plan was developed to be consistent with the direction set forth in the *Regional Federal-Aid Highways 2035 Transportation Plan for the District of Maui* (HDOT, 2014). This district-level plan provides the policy basis for making land transportation decisions over the next 20 years in an economic environment with limited funding. The Kihei Sub-area Transportation Plan is a finer-grain look at specific recommendations for the Kihei subarea of Maui, especially those projects that could be implemented in less than 20 years.

The study process lasted 18 months and included the following nine major steps as part of the work plan (Exhibit 1-3):

1. *Plan Kick-off* – Established a common understanding of Plan purpose, content, and timeline.
2. *Data Collection* – Gathered data on land use and transportation in the Kihei area.
3. *Review Previous Studies* – Ensured a shared understanding of previous work and created a foundation of prior knowledge and local and state interests.
4. *Establish Goals and Objectives* – Consistent with federal, state, and local priorities, defined desired outcomes for projects, and criteria by which to assess potential solutions.
5. *Establish Evaluation Process* – Using the goals and objectives developed for the Plan, created a process for evaluation and prioritization of potential solutions.
6. *Evaluate Existing Transportation System* – Assessed the existing multimodal transportation system for issues and opportunities for improvement.
7. *Identify Concepts* – Developed potential solution concepts (for example, potential improvements to the transportation system, such as additional sidewalks or intersection lane configuration changes) and vetted them with stakeholders.
8. *Evaluate Concepts and Prioritize Projects* – Using the established goals, objectives and evaluation process, applied criteria to the concepts to analyze which projects performed better than others according to stakeholder values.
9. *Develop Kihei Sub-area Plan* – Summarized the Plan process, outcomes, and ways to measure effectiveness and success. Focused on strategies for implementation to ensure funding viability and smooth transitions from planning to environmental review to design and construction.

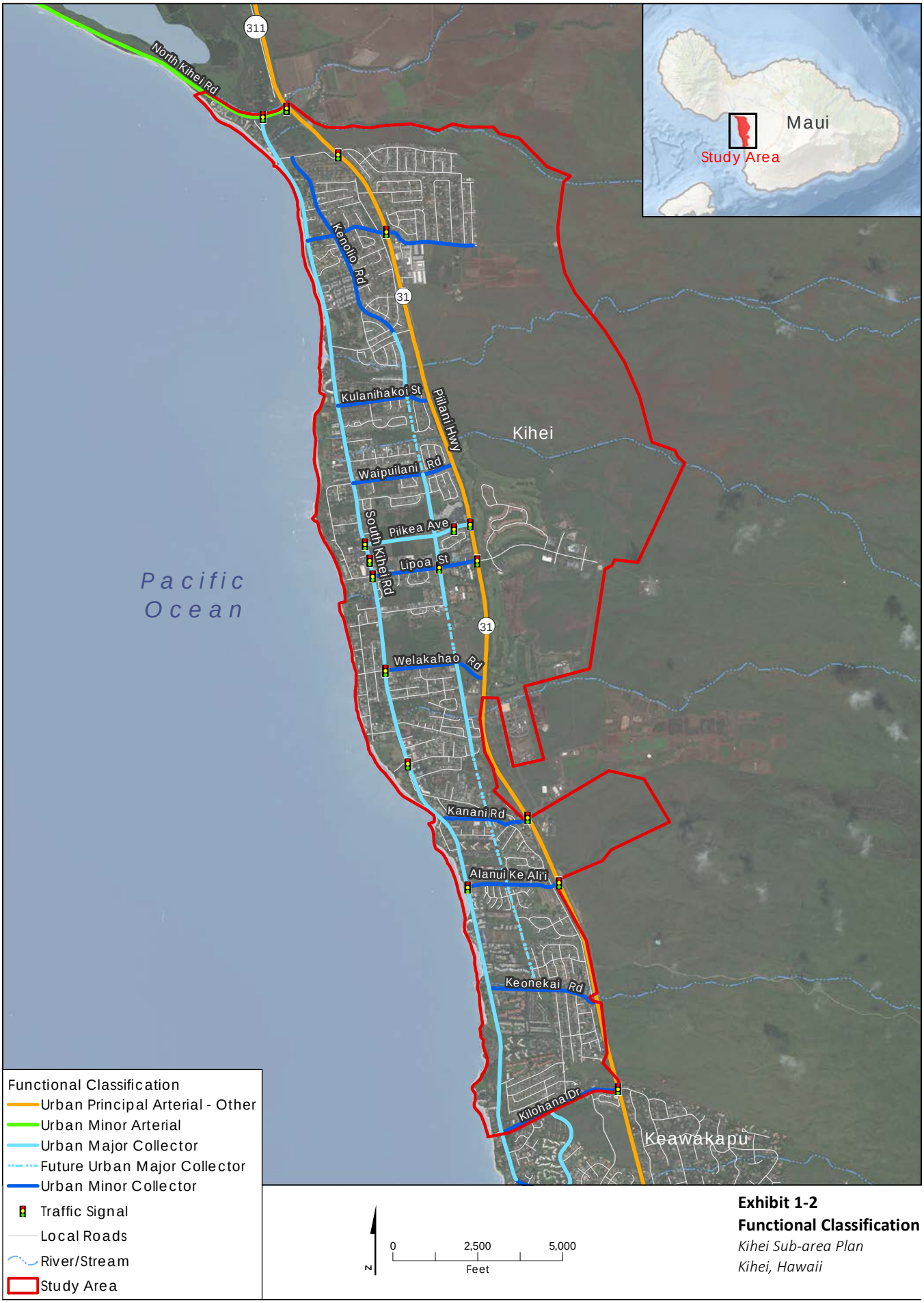
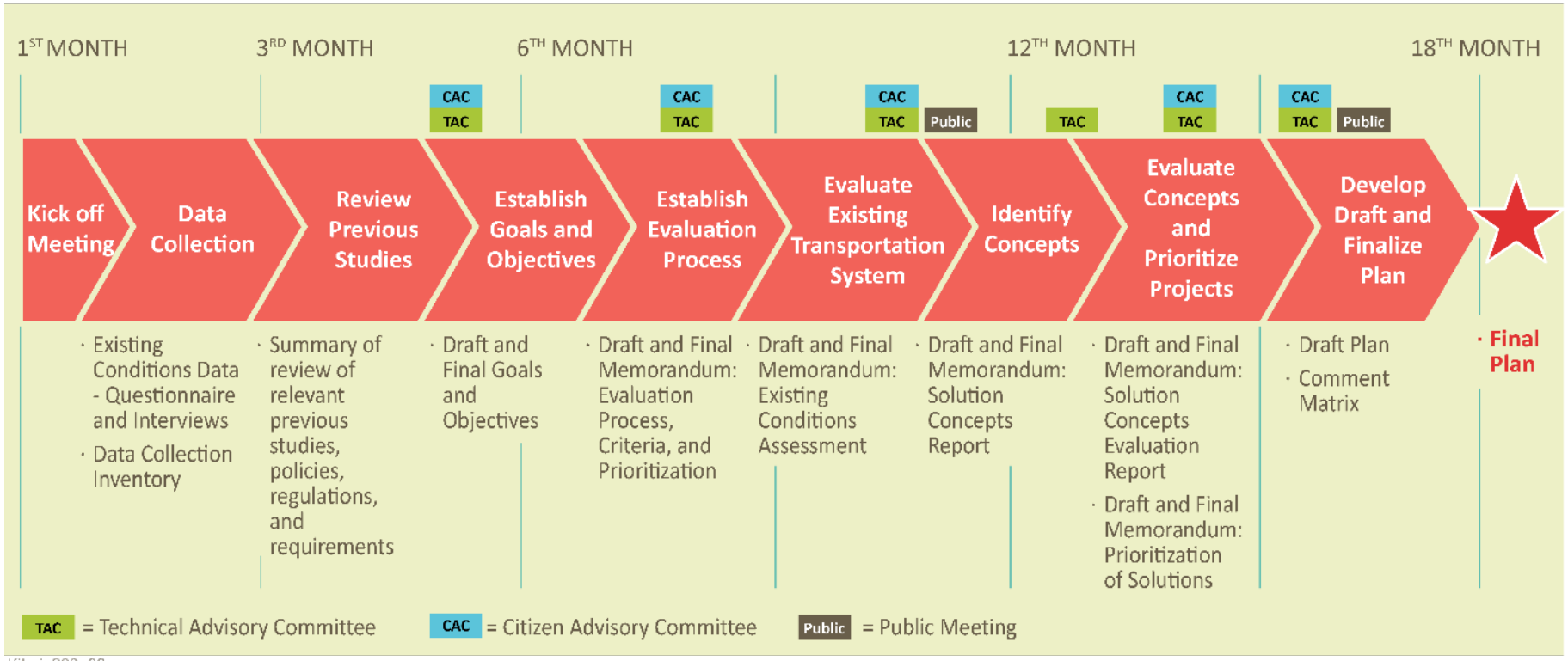



**Exhibit 1-2**
**Functional Classification**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

Exhibit 1-3. Kihei Sub-area Transportation Work Plan




Kihei_200_02

Three stakeholder groups—the Technical Advisory Committee (TAC), the Citizen Advisory Committee (CAC), and the public—were involved. The work plan shows key milestones where the TAC and CAC input were obtained to help review and validate the various work products. This process is described in the next section.

## 1.3 Stakeholder Involvement Process

The County designed the stakeholder involvement process for the Kihei Sub-area Transportation Plan to build on engagement processes and outcomes from previous planning efforts. The plan development process involved two stakeholder groups, the TAC and the CAC.

The FHWA was part of the TAC and provided input on the overall Plan process, as well as on federal guidance.

Exhibit 1-4 details the roles of the committees.

Exhibit 1-4. Stakeholder Advisory Committees

| Role | Members |
|---|---|
| **Technical Advisory Committee** | |
| The TAC provided technical input throughout the development of the project. Members shared the perspectives of their agencies, as well as information about prior or ongoing work products and projects. The TAC acted as a communication link among jurisdictions and as liaison to their respective agencies. | ▪ **HDOT**: Maui District and Planning Branch<br>▪ **County of Maui**: Department of Public Works (DPW), Planning Department, Department of Transportation, Department of Fire and Public Safety, Police Department, and Department of Parks and Recreation<br>▪ Maui Metropolitan Planning Organization (MPO)<br>▪ FHWA |
| **Citizen Advisory Committee** | |
| The CAC provided a balanced representation of public interests for the project. Members shared their experiences, the perspectives of their organizations, and provided input at key decision points and throughout the process. The CAC acted as a communication link and liaison to their respective organizations/interest groups. | ▪ Aloha Akina Tours<br>▪ Kihei Community Association<br>▪ Maui Bicycling League<br>▪ Maui Economic Opportunity (MEO)<br>▪ Maui Hotel and Lodging Association<br>▪ Maui Visitor's Bureau<br>▪ Kihei Canoe Club<br>▪ Kihei Charter School<br>▪ Kihei Youth Center<br>▪ Lokelani Intermediate School<br>▪ Local landowner/developers |

*The TAC provided technical input from the perspectives of their agencies and information about prior or ongoing work.*

*The CAC provided balanced representation of public interests and provided input at key decision points.*

# 1.4 Public Outreach

In addition to the involvement of the TAC and CAC, two major public outreach forums were organized: a booth set up and staffed at the Kihei Fourth Friday Town Party at Azeka Mauka on June 22, 2018, and an Online Open House website that went live on October 23, 2018, and accepted public comments through November 12, 2018.

## 1.4.1 Kihei Fourth Friday—June 22, 2018

Members of the project team, including Jacobs and Maui County DPW personnel, staffed a booth at the Kihei Fourth Friday from 6 p.m. to 9 p.m. on June 22, 2018. Maui Friday Town Parties is an initiative developed by the Maui County Office of Economic Development to showcase the island's historic towns and celebrate the unique nature of their business communities. In addition to Azeka's established restaurants and retail stores, the Kihei Fourth Fridays Town Parties include keiki and teen activities, a food court, food booths and trucks, retail booths, music, and special events.

Public outreach at the Fourth Friday was important to obtain input from area residents who may not attend a traditional public meeting. The Project booth at Fourth Friday was advertised online, in the Maui News, on television and radio, and via email to the TAC, CAC, and other stakeholders.

Approximately 30 people visited the Project booth and gave over 45 individual comments on the Plan and its potential solutions. Attendees provided comments by marking maps, submitting comment sheets, and talking with the project team.

## 1.4.2 Online Open House


*A Kihei Sub-area Study website was launched as an Online Open House, to allow the general public to review draft Plan materials and provide comments and suggestions.*

An Online Open House was developed to provide an opportunity for island-wide input into the study area. The Kihei area serves a critical regional link between the Wailea-Makena and the rest of the island. The Online Open House was advertised online, in the Maui News, on television and radio, and via email to the TAC, CAC, and other stakeholders.

The website included details and figures explaining the Plan study area, the Plan's goals and objectives, an overview of the planning process and timeline, solutions evaluation criteria, interactive geographic information system (GIS)-based maps containing multiple data layers, and a prompt-based feedback form designed to solicit information on existing problems and potential solutions.

Exhibit 1-5 shows a count of endorsements (for solutions already being considered) and new solution ideas that were received through the Kihei Fourth Friday booth and the Online Open House.

Exhibit 1-1. Summary of Public Comments Received

| Source | Endorsement | New Solution | Total |
|---|---|---|---|
| Fourth Friday | 1 | 6 | 7 |
| Online Open House | 28 | 12 | 42 |
| Public Outreach Total | 29 | 18 | 49 |

Goals and objectives are the refined articulation of the Plan purpose, guiding future planning and implementation of solutions toward desired outcomes.

# Goals and Objectives

Chapter 2

Goals, objectives, evaluation criteria, performance measures, and targets are linked to the purpose of the Plan previously described in Chapter 1.

Chapter 2 summarizes the development of goals, objectives, and evaluation criteria for the Plan, while Chapter 5, Implementation, discusses performance measures and targets and a plan for monitoring, evaluation, and reporting.

The development of goals and objectives is an important first step in a planning process, as they work together to do the following:

- Ensure the Plan builds effectively on previously adopted state, regional, and local plans and policies
- Ensure the Plan shows consistency with federal, state, and county requirements and guidance
- Guide development of Plan solutions and prioritized recommendations
- Provide a foundation for the development of performance measures and targets to measure the effectiveness of the plan recommendations over time

Chapter 2 shows how that is achieved through the following subsections:

- Development of Goals, Objectives, and Evaluation Criteria
- Fixing America's Surface Transportation Act of 2015 (FAST Act) and Performance-Based Planning
- Planning and Environment Linkages

Clearly defined terminology is important to establishing a common understanding of the Plan and communicating Plan information. Consistent with the 2013 FHWA Performance-Based Planning and Programming guidance, the following terms are defined for the Plan:

- **Goal:** A broad statement that describes a desired end state.
- **Objective:** A specific and measurable statement to guide actions to achieve the goal.
- **Evaluation Criteria:** Ways to measure if a potential solution is meeting an objective (and therefore working toward the goal). For this study, evaluation criteria were developed consistent with goals and used to evaluate and prioritize recommendations.
- **Performance Measures:** Metrics used to assess progress toward meeting a goal. For this study, performance measures are a subset of the evaluation criteria, and are used to evaluate the performance of the Plan over time. To be effective, performance measures require a monitoring and reporting plan.
- **Target:** A specific level of performance that is desired to be achieved within a certain timeframe. A target is an expression of a desired outcome. For this study, a meaningful, focused set of targets were developed — consistent with performance measures — to assess effectiveness of Plan recommendations over time and inform future decision-making.

It is important to establish goals, objectives, and evaluation criteria before identifying potential solutions to ensure that they are not biased or tailored toward a specific solution. Goals and objectives are a written expression of the values of the different stakeholders involved with a planning process. Evaluation criteria are applied to each solution and require analysis to show how well solutions perform in achieving Plan goals and objectives. The evaluation criteria show the advantages and disadvantages of the proposed solutions compared to each other. Using the evaluation criteria, solutions are prioritized for recommendation and ultimately programming the specific solutions back to the goals and objectives.

## 2.1 Development of Goals, Objectives, and Evaluation Criteria

For the Kihei Sub-area Transportation Plan, the project team considered the following while developing the Plan's goals, objectives and evaluation criteria:

1) The purpose of the Kihei Sub-area Transportation Plan
2) Goals, objectives, and policies identified in previous plans and projects, based on previous public input
3) Federal guidance outlined in MAP-21 Section 1203/23 United States Code (U.S.C.) 150 (National Goals and Performance Management Measures) (now superseded by the FAST Act) and federal planning and environment linkages
4) Input from, and approval by, the Kihei Sub-area Transportation Plan TAC and CAC

Draft goals, objectives, and evaluation criteria were vetted with the TAC and CAC and revised to ensure that they were consistent with local, regional, and state needs.

The project team reviewed the following plans and policies to inform the development of the goals, objectives, and evaluation criteria. A full summary of these plans and policies is included in Appendix A.

- *Federal-Aid Highways 2035 Transportation Plan for the District of Maui* (HDOT, 2014)
- *Federal-Aid Functional Classification Update: Policy and Procedures* (HDOT, 2012)
- *Bike Plan Hawaii* (HDOT, 2003)
- *Statewide Pedestrian Master Plan* (HDOT, 2013)
- *Kihei Traffic Master Plan* (County of Maui, 1996)
- Act 54, May 2009; Hawaii Revised Statutes (HRS) §264-20.5 Complete Streets; and Complete Streets Policy Resolution (County of Maui, 2012a)
- *Countywide Policy Plan* (County of Maui, 2010)
- *Maui Island Plan General Plan 2030* (County of Maui, 2012b)
- *Kihei-Makena Community Plan* (County of Maui, 1998)
- *South Maui Region Parks and Open Space Master Plan* (County of Maui, 2003)
- *Pre-Final Kihei Drainage Master Plan, Waiakoa Gulch to Kilohana Drive* (County of Maui, 2016b)
- *Maui Short Range Transit Plan* (County of Maui, 2016a)

The goals and objectives of this Plan span 14 different categories. To differentiate score weighting between the 14 goal areas and provide more reliable relative scoring results, the goals were divided into two groups. The Plan's Group A goals include the Safety, Complete Streets, System Preservation and Resiliency, Local Capacity and Congestion, Cost, Land Use, and Accessibility categories. The Plan's Group B goals include the Regional Capacity and Mobility, Transit, Economic Vitality, Right-of-way, Natural Environment, Cultural Resources, and Equity categories.

During the Plan's evaluation stages, each potential solution was given a score for each of the 14 goals. Scores for the Group A goals were weighted twice as heavily as the scores for the Group B goals.

Exhibit 2-1 lists the goals and objectives for the Kihei Sub-area Transportation Plan.

Exhibit 2-1. Kihei Sub-area Transportation Plan Goals and Objectives

| Goals [a] | Objectives |
|---|---|
| **1.** ***Safety*** Maintain a safe transportation system for users of all modes of travel and improve safety of the community  | ▪ Maintain a safe transportation system for users of all land transportation modes<br>▪ Reduce the potential for conflicts between motorized and non-motorized modes of travel<br>▪ Address transportation safety through education and enforcement, as well as and engineering solutions<br>▪ Identify locations where there are elevated numbers of crashes<br>▪ Provide alternate or emergency access routes for communities in Kihei, especially in southern locations that are affected by limited roadways for ingress and egress<br>▪ Provide a transportation system that supports evacuation, response, and recovery for incidents |
| **2.** ***Complete Streets*** Create a balanced, multimodal Complete Streets transportation network that provides options and access for motorized and non-motorized modes of travel  | ▪ Improve transportation facilities to support all modes of surface travel and create a systemwide network for ease of connection between transport modes<br>▪ Improve pedestrian and bicycle mobility, access, and connectivity throughout Kihei<br>▪ Encourage bike lanes and sidewalks on all new roadways, where appropriate<br>▪ Promote efficient travel between modes by improving connections and removing barriers |
| **3.** ***System Preservation and Resiliency*** Maintain an efficient, complete, resilient transportation system for the long term  | ▪ Plan and implement existing system improvements to effectively sustain the transportation system's safe, efficient, and complete operations<br>▪ Increase the resiliency of transportation facilities<br>▪ Provide a transportation system that is designed to appropriate storm events<br>▪ Promote transportation infrastructure recognizing the potential effect of sea level rise and extreme weather changes on transportation facilities<br>▪ Incorporate strategies for adapting to potential energy supply disruption |
| **4.** **Regional Capacity and Mobility** Improve regional vehicular capacity and reduce congestion on roadways entering and exiting Kihei  | ▪ Develop alternate routes to accommodate regional growth<br>▪ Consider a variety of intersection treatments to manage traffic flow to and from Piilani Highway |
| **5.** ***Local Capacity and Congestion*** Improve local vehicular capacity and reduce congestion within Kihei  | ▪ Complete north-south connections, oceanward (*makai*) of Piilani Highway, to improve the local roadway network and divert local trips from Piilani Highway<br>▪ Improve connector roads to provide alternate routes and access options<br>▪ Manage access between residential, hotel, and commercial zones along South Kihei Road |

Exhibit 2-1. Kihei Sub-area Transportation Plan Goals and Objectives

| Goals [a] | Objectives |
|---|---|
| **6. Transit** Develop a transit system that addresses the needs of residents and visitors and contributes to sustainable and livable communities | ▪ Improve public transit facilities by increasing users' comfort, convenience, and safety<br>▪ Improve or increase transit services<br>▪ Improve intermodal connections (such as transit, pedestrian, and bicycle connections) |
| **7. Economic Vitality** Promote the expansion and diversification of Kihei's economy through the efficient and effective use of transportation facilities and amenities | ▪ Improve the movement of people, goods, and services through congestion relief and increased capacity<br>▪ Maintain and develop an integrated and reliable freight system or network by ensuring connectivity between local roadways and regional roadways<br>▪ Allow for efficient servicing of businesses, including deliveries and access to back-of-house areas<br>▪ Promote integration of transportation facilities and information systems for efficient movement for business and leisure purposes |
| ***8. Cost*** Obtain sufficient transportation funding | ▪ Minimize project costs<br>▪ Explore other funding alternatives |
| **9. Right-of-way** Minimize impacts to right-of-way | ▪ Develop improvements to minimize the amount of right-of-way take<br>▪ Identify improvements that can be implemented on existing right-of-way under the jurisdiction of Maui County, HDOT, or Plan partners<br>▪ Investigate land swaps with other government agencies to acquire right-of-way |
| ***10. Land Use*** Develop transportation system projects that support the land uses in the study area | ▪ Provide transportation facilities that complement the neighboring land use<br>▪ Identify the appropriate functional classification of the roadways and design features<br>▪ Plan and design access management treatments to appropriately and adequately support adjacent land uses |
| **11. Natural Environment** Preserve and enhance the natural environment | ▪ Minimize and reduce environmental impacts, including physical, biological, and aesthetic resources<br>▪ Minimize impacts to wetlands, shoreline, streams, and environmentally sensitive areas<br>▪ Provide transportation facilities that complement the natural environment and enhance quality of life<br>▪ Promote the use of sustainable practices in planning, designing, constructing, and maintaining transportation facilities and programs |
| **12. Cultural Resources** Preserve cultural resources | ▪ Avoid, minimize, and provide reasonable measures to mitigate degradation of cultural resources and the environment caused by transportation facilities and operations |

Exhibit 2-1. Kihei Sub-area Transportation Plan Goals and Objectives

| Goals [a] | Objectives |
|---|---|
| ***13. Accessibility*** Improve the transportation system for people of varying abilities  | ▪ Improve the ease with which persons with impaired abilities can reach goods, services, activities, and destinations<br>▪ Provide access for persons with disabilities whenever a pedestrian way is newly built or altered |
| **14. Equity** Ensure the fair treatment and meaningful involvement of all populations  | ▪ Seek out and consider the needs of the transportation-disadvantaged<br>▪ Avoid or minimize disproportionately high and adverse human health and environmental effects, including social and economic effects on minority and low-income populations<br>▪ Provide equitable levels of transportation and transit services and benefits to minority and low-income populations |

Notes:
[a] Group A goals are ***bolded and italicized***, with their rows shaded; Group B goals are **bolded** and are unshaded.

## 2.2 FAST Act and Performance-based Planning

The County identified efficient implementation of the Kihei Sub-area Transportation Plan projects as a key desired outcome. To ensure the time, effort, and dollars spent between the planning and implementation stages of a project are as streamlined as possible, the goals, objectives, and evaluation criteria must align with funding streams and state, federal, and county requirements.

The FAST Act is the federal legislation that replaced and supplemented portions of prior federal transportation legislation, the Moving Ahead for Progress in the 21st Century Act (MAP-21 Act). Performance management, as stated in 23 U.S.C. 150 (Declaration of Policy), is intended to *"... transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decision-making through performance-based planning and programming."* With limited funding for all state highway and local programs, it is critical that investments are targeted toward desired outcomes.

Performance-based planning is a planning process that integrates and embeds performance management concepts by using data to support decision-making. According to the FHWA *Performance Based Planning and Programming Guidebook* (2013), *"It generally starts with a vision and goals for the transportation system, selection of performance measures, and use of data and analysis tools to inform development of investment priorities, which are then carried forward into shorter-term investment planning and programming."* The project team integrated principles of Performance-Based Planning and Programming throughout the planning process. Exhibit 2-2 depicts the components of a Performance-Based Planning and Programming approach such as that used for the Kihei Sub-area Transportation Plan.

23 U.S.C. §150(b) states that the Federal-aid highway program should focus on seven national goals:

- Safety – Significantly reduce traffic fatalities and serious injuries on all public roads
- Infrastructure Condition – Maintain highway infrastructure assets in good state of repair
- Congestion Reduction – Significantly reduce congestion on the NHS
- 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
- Reduced 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

These national goals were integrated into the development of the goals and objectives for the Plan. Exhibit 2-3 shows how the goals of the Kihei Sub-area Transportation Plan are linked with the national goals, as well as how the goals and data used for application of evaluation criteria demonstrate planning and environmental linkages (PEL), which will be discussed in the next section of this Chapter.

Exhibit 2-2. FHWA Framework for Performance-based Planning and Programming


Source: FHWA, 2013

Exhibit 2-3. Plan Goals and Relationship to FHWA National Goals and Planning and Environment Linkages

| Plan Goals | MAP-21 National Goals | Planning/Environment Linkages |
|---|---|---|
| ***1. Safety***<br>Maintain a safe transportation system for users of all modes of travel and improve safety of the community | ▪ Safety | ▪ Safety issues documented for future efforts |
| ***2. Complete Streets***<br>Create a balanced, multimodal Complete Streets transportation network that provides options and access for motorized and Non-motorized modes of travel | ▪ Congestion Reduction<br>▪ Environmental Sustainability | ▪ Documents multimodal transportation system for future efforts |
| ***3. System Preservation and Resiliency***<br>Maintain an efficient, complete, resilient transportation system for the long term | ▪ Infrastructure Condition<br>▪ System Reliability<br>▪ Freight Movement and Economic Vitality | ▪ System preservation or improvement needs documented for future efforts |
| **4. Regional Capacity and Mobility**<br>Improve regional vehicular capacity and reduce congestion on roadways entering and exiting Kihei | ▪ Congestion Reduction<br>▪ System Reliability<br>▪ Freight Movement and Economic Vitality | ▪ Vehicle traffic documented for future efforts |
| ***5. Local Capacity and Congestion***<br>Improve local vehicular capacity and reduce congestion within Kihei | ▪ Congestion Reduction<br>▪ System Reliability<br>▪ Freight Movement and Economic Vitality | ▪ Vehicle traffic documented for future efforts |
| **6. Transit**<br>Develop a transit system that addresses the needs of residents and visitors and contributes to sustainable and livable communities | ▪ Congestion Reduction<br>▪ Environmental Sustainability | ▪ May avoid necessity for intensive environmental review (smaller-footprint projects) |
| **7. Economic Vitality**<br>Promote the expansion and diversification of Kihei's economy through the efficient and effective use of transportation facilities and amenities | ▪ Freight Movement and Economic Vitality | ▪ Documents preliminary economic impacts and efficient use of existing transportation facilities and amenities |
| ***8. Cost***<br>Obtain sufficient transportation funding | ▪ Reduced Project Delivery Delays | ▪ May avoid necessity for intensive environmental review |
| **9. Right-of-way**<br>Minimize impacts to right-of-way | ▪ Reduced Project Delivery Delays<br>▪ Environmental Sustainability | ▪ May avoid necessity for intensive environmental review |
| ***10. Land Use***<br>Develop transportation system projects that support the land uses in the study area | ▪ Congestion Reduction<br>▪ System Reliability | ▪ Land use compatibility documented for future efforts |
| **11. Natural Environment**<br>Preserve and enhance the natural environment | ▪ Environmental Sustainability | ▪ Examination of wetlands, shoreline, streams, and environmentally sensitive areas |
| **12. Cultural Resources**<br>Preserve cultural resources | ▪ Environmental Sustainability | ▪ Examination of cultural and historic resources |

Exhibit 2-3. Plan Goals and Relationship to FHWA National Goals and Planning and Environment Linkages

| Plan Goals | MAP-21 National Goals | Planning/Environment Linkages |
|---|---|---|
| ***13. Accessibility***<br>Improve the transportation system for people of varying abilities | ▪ Safety | ▪ Consideration of accommodations for use by persons with disabilities |
| **14. Equity**<br>Ensure the fair treatment and meaningful involvement of all populations | ▪ Safety<br>▪ Freight Movement and Economic Vitality | ▪ Considers potential project impacts on underserved populations |

Notes:

Group A goals are ***bolded and italicized***, with their rows shaded; Group B goals are **bolded** and are unshaded.

# 2.3 Planning and Environment Linkages

The concept of creating a more efficient transition between longer-range planning processes and more finely grained environmental processes has been around for a long time. The idea is to streamline the amount of time from project conception to implementation. It is often the case that longer-range planning processes are conducted separately from environmental review processes, and often involve different staff, which can lead to redundancies.

According to the FHWA Environmental Review Toolkit, *"Planning and Environmental Linkages (PEL) represents a collaborative and integrated approach to transportation decision-making that 1) considers environmental, community, and economic goals early in the transportation planning process, and 2) uses the information, analysis, and products developed during planning to inform the environmental review process."* 23 U.S.C. §168 (f) (3) focuses on the ability to use results from a planning process in the environmental review process. Fairly recent Council on Environmental Quality (CEQ) guidance also expands the types of projects that may be considered a Categorical Exclusion (a less-intensive environmental review than an Environmental Assessment or an Environmental Impact Statement).


The Kihei Sub-area Transportation Plan was designed as an integrated approach to decision-making, and the development of goals, objectives, and evaluation criteria considered environmental, community, and economic goals early in the process. Sub-area planning is one of the tools recommended for linking the planning and environmental review stages of a project, because it is a logical process including screening of alternatives and preliminary identification of environmental impacts.

The Kihei Sub-area Transportation Plan includes the logical and transparent development of goals, objectives, evaluation criteria, performance measures, and targets to document the decision-making process for future implementation. Much of this same information would need to be examined during a subsequent environmental review process. Although the Plan effort included several shorter-term, lower-cost, and lower-impact solutions, many of the recommended solutions will likely require an environmental review process. The documentation from this planning effort can be used to assist project delivery of the recommended solutions, with the following benefits:

- Minimize duplication of efforts – The PEL approach improves the sharing of information and early consultation with HDOT, FHWA, and stakeholders, resulting in reduced or eliminated duplication of work in the planning and National Environmental Protection Act (NEPA) and Hawaii Environmental Policy Act (HEPA) processes.

- Documentation – The PEL approach documents the planning information and decisions for environmental review and NEPA/HEPA.
- Improved relationships and coordination – The PEL approach often improves relationships and coordination between partner agencies and key community stakeholders that were engaged in the development of the Kihei Sub-area Transportation Plan.
- Decisions and Analysis to inform NEPA/HEPA – The PEL approach uses transportation planning decisions and analysis, including goals and objectives, identification of preliminary alternatives, and elimination of unreasonable alternatives that can be used to inform NEPA/HEPA.

The Kihei Sub-area Transportation Plan included several goals, objectives, and evaluation criteria designed to minimize impacts considered in an environmental review process. For example, minimizing impacts to private property, preserving and enhancing the natural environment, maintaining the existing land use within the Plan area, minimizing project costs, and considering projects that can be implemented in a shorter time frame all relate to documenting and minimizing impacts.

Understanding existing context, issues, and environmental constraints helps to identify potential solutions.

# Existing Context and Conditions

Chapter 3

The purpose of the Kihei Sub-area Transportation Plan is to develop transportation solutions to address mobility needs and congestion for all modes of transportation in the Kihei area. To develop appropriate solutions, it is important to have a common understanding of the existing land use and transportation context and issues, as well as current environmental constraints that may limit potential solutions. In addition, an assessment of existing vehicle traffic conditions provides the baseline for projecting future traffic conditions—and future potential problem areas—so that the solutions developed as part of this Plan are forward-looking.

## 3.1 Overview of Concerns

Concerns voiced by the TAC, CAC, stakeholders, and the public provide essential context to any consideration of existing conditions. These groups highlighted four major categories of problems and solutions: (1) capacity, congestion mitigation and management, (2) safety, (3) pedestrian and multimodal facilities, and (4) reducing and mitigating the potential environmental impacts of the transportation system in Kihei. The following sections categorize the most significant and commonly discussed concerns, by facility.

### 3.1.1 South Kihei Road

South Kihei Road is the transportation spine of the community, providing local access to beaches, shopping areas, community facilities, and visitor accommodations. There was consensus that pedestrian and multimodal improvements are needed in relation to sidewalks, crosswalks, and bike lanes on South Kihei Road. Improvements to intersections, signal operations and coordination may improve congestion in several key areas. In particular, the block between Piikea Avenue and Lipoa Street was cited as a common area for daily congestion.

*South Kihei Road in front of the Azeka Shopping Center*

South Kihei Road runs parallel to the coastline and is subject to future erosion on the north end. In addition, the drainage for South Kihei Road can be subject to tidal influence and high volumes of rainfall from the *mauka* areas. Drainage system upgrades and erosion and flood control measures will improve safety and environmental conditions.

### 3.1.2 North-South Collector Road

Despite the complexity and large estimated cost to complete all phases of the north-south collector road, there was consensus on the need to complete the facility. Adding the phases incrementally will ultimately have major improvements on the function of Kihei's transportation system. It will expand the roadway grid, thereby providing more travel options for people to reach their desired destinations, allowing for maneuvering around temporary road closures (work zones) and traffic incidents, and providing access to alternate routes for emergency egress. As shorter trips are diverted from Piilani Highway to the north-south collector, systemwide congestion should be mitigated. Extension of the greenway in association with the north-south collector will increase non-motorized capacity with a safe, attractive facility for pedestrians and bicyclists.

### 3.1.3 Piilani Highway

*Piilani Highway*

In addition to system preservation projects, stakeholders recommended improvements to Piilani Highway in the form of intersection upgrades, lighting enhancements, new bike facilities, signal operations, speed limit reviews, and a new upcountry connector road, to address capacity and safety concerns.

Construction of Kihei High School, on the *mauka* side of Piilani Highway and scheduled to open in 2021, will require coordination between HDOT and the Department of Education to accommodate ingress and egress from the highway, increased traffic volumes, and pedestrian access.

### 3.1.4 Mauka-Makai Streets

In addition to the north-south corridors that serve Kihei's linear urban form, a series of *mauka-makai* cross streets fill in the transportation grid. *Mauka-makai* streets run from the inland, upslope areas to the coast. Stakeholders identified the need for continuous sidewalks and critical emergency access (tsunami evacuation) routes in specific locations.

Some parts of the grid are experiencing high levels of congestion where local roads are interfaced inadequately with the highway. On Piikea Avenue and along Liloa Drive between Piikea and East Lipoa Street, there is a cluster of prominent, high-volume destinations: the Kihei Community Center, Kihei Elementary School, and Lokelani Intermediate School all lie within a 1-block radius that can become highly congested at certain times of the day, such as the end of the school day or when special events occur, when access to Piilani Highway can be difficult.

In addition, the County broke ground in 2017 on a new 34,000-square-foot recreation center located at the end of Liloa Drive, just south of Lokelani Intermediate School. The facility will have two basketball/volleyball courts laid out end to end, with combined seating for over 1,000 people. The facility will also include a commercial kitchen, meeting rooms, and outdoor community spaces that are able to accommodate food trucks. The recreation center is anticipated to be completed in 2019 and will become another high-volume destination in an already busy neighborhood.

This plan was intended to assess and address potential solutions to these major concerns.

## 3.2 Assessment of Conditions

To provide a comprehensive understanding of the context of these issues and potential solutions, this chapter describes the following for the Kihei area:

- Existing land use conditions
- Existing socioeconomic conditions
- Existing land transportation system conditions
- Existing drainage areas, gulches, and wetlands
- Existing sea level conditions and risks
- Existing historic and archaeological sites

### 3.2.1 Land Use Conditions

Transportation facilities support and are often driven by the adjacent land uses. Likewise, the availability and type of transportation services can affect the ways that land is developed. Transportation facilities such as the roadway network, sidewalks, or bicycle lanes should be developed to provide adequate mobility for all users while appropriately supporting existing and future land uses.

Exhibit 3-1 shows the zoning classifications within the study area. The majority of land in Kihei is designated as single-family and multi-family residential. While most of these lands are situated *makai* of Piilani Highway, a large area of single-family residential land exists *mauka* of Piilani Highway between Uwapo Road and Ohukai Road. Parks, open space, and public lands are interspersed among residential land uses throughout Kihei and along the coastline.

There are concentrated areas of land designated as commercial adjacent to Piikea Avenue, Lipoa Street, and Halekuai Street in Kihei's downtown core and along South Kihei Road between Kupuna Street and Auhana Road. Multiple shopping centers along these streets include supermarkets, restaurants, retail shops, government services, and services supporting the tourism industry.

Land use goals and objectives for South Maui are described in the 1998 *Kihei-Makena Community Plan*, which includes both specific recommendations to address anticipated future conditions and considerations to guide policy and decision-making.

The *Kihei-Makena Community Plan* envisions 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 Kihei and South Maui. This vision could be advanced through development of parks and open spaces, preservation of agricultural lands, and enhancements to an integrated system of motorized and non-motorized facilities to accommodate growth.

The County of Maui Planning Department will soon begin a process to update the *Kihei-Makena Community Plan.* The new community plan will incorporate updated land use designations recommended in a 2018 zoning code audit. The updated community plan designations include 14 land use categories that are defined in the *West Maui Community Plan Land Use Technical Resource Paper* (County of Maui 2019). The new designations are designed to do the following:

- Facilitate the development of unique places that offer a mix of uses and a broad range of housing choices for residents.
- Shift the focus from a separation of uses toward an emphasis on contextual form and function, leading to the creation of complete communities in Maui.
- Lessen the overlap and confusion between land use designations and zoning.

## 3.2.2 Socioeconomic Conditions

Socioeconomic characteristics influence the demand for transportation services and infrastructure and should be considered when planning for future transportation conditions. Socioeconomic data include information on population, households, employment, and the visitor industry, all of which can influence trip generation and patterns to destinations. Trips are typically generated from households. Trip destinations are related to activities such as employment, schools, shopping, and recreation.

### 3.2.2.1 Population

According to 2015 data from the U.S. Census Bureau (2016), just over 24,500 residents live within the study area boundaries. This is roughly 16 percent of the population of Maui Island. Exhibit 3-2 shows the population density in terms of people per square mile, by census block group. While residences are distributed throughout Kihei, the most densely populated areas are at the northern end of the study area, *mauka* of Piilani Highway at Ohukai Road, and at the southern end of the study area on South Kihei Road, just south of Keonekai Road. In general, the study area is more densely populated north of the downtown retail core than south of Lipoa Street.

Access to transportation can sometimes be influenced by a person's age. Children and young adults are unable to own and operate a motor vehicle, while older adults may choose not to drive a personal vehicle. Overall, Kihei has a relatively large population under the age of 20, but particularly in the northern part of the study area, where most schools are located. The percentage of the population over the age of 65 is higher in the southern part of the study area.

Exhibit 3-3 shows the percentage of the census block group population that is under the age of 20. *Mauka* of Piilani Highway at the northern end of the study area and in the downtown retail core (generally between Lipoa Street and Waipuilani Road), approximately 30 to 40 percent of the population is under the age of 20. In the remainder of the study area, people under the age of 20 make up approximately 10 to 30 percent of the population. Exhibit 3-4 depicts the percentage of the population over the age of 65. Between 30 and 40 percent of the population *makai* of South Kihei Road and north of Lipoa Street are over the age of 65; this area has the highest percentage of people over the age of 65 in the study area. In general, people over the age of 65 make up less than 20 percent of the population in the northern end of the study area, while they make up more than 20 percent at the southern end of the study area.

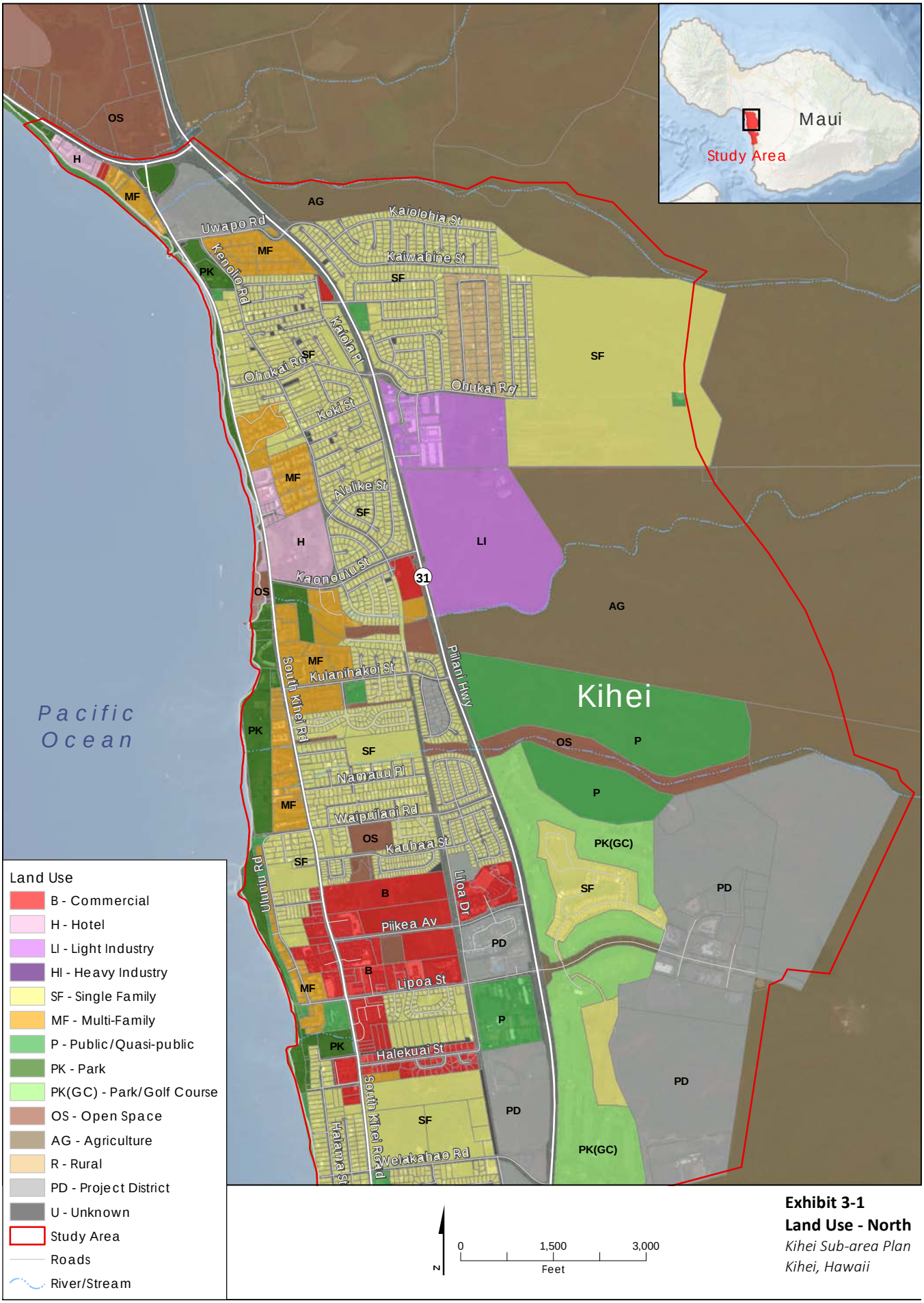



**Exhibit 3-1**
**Land Use - North**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

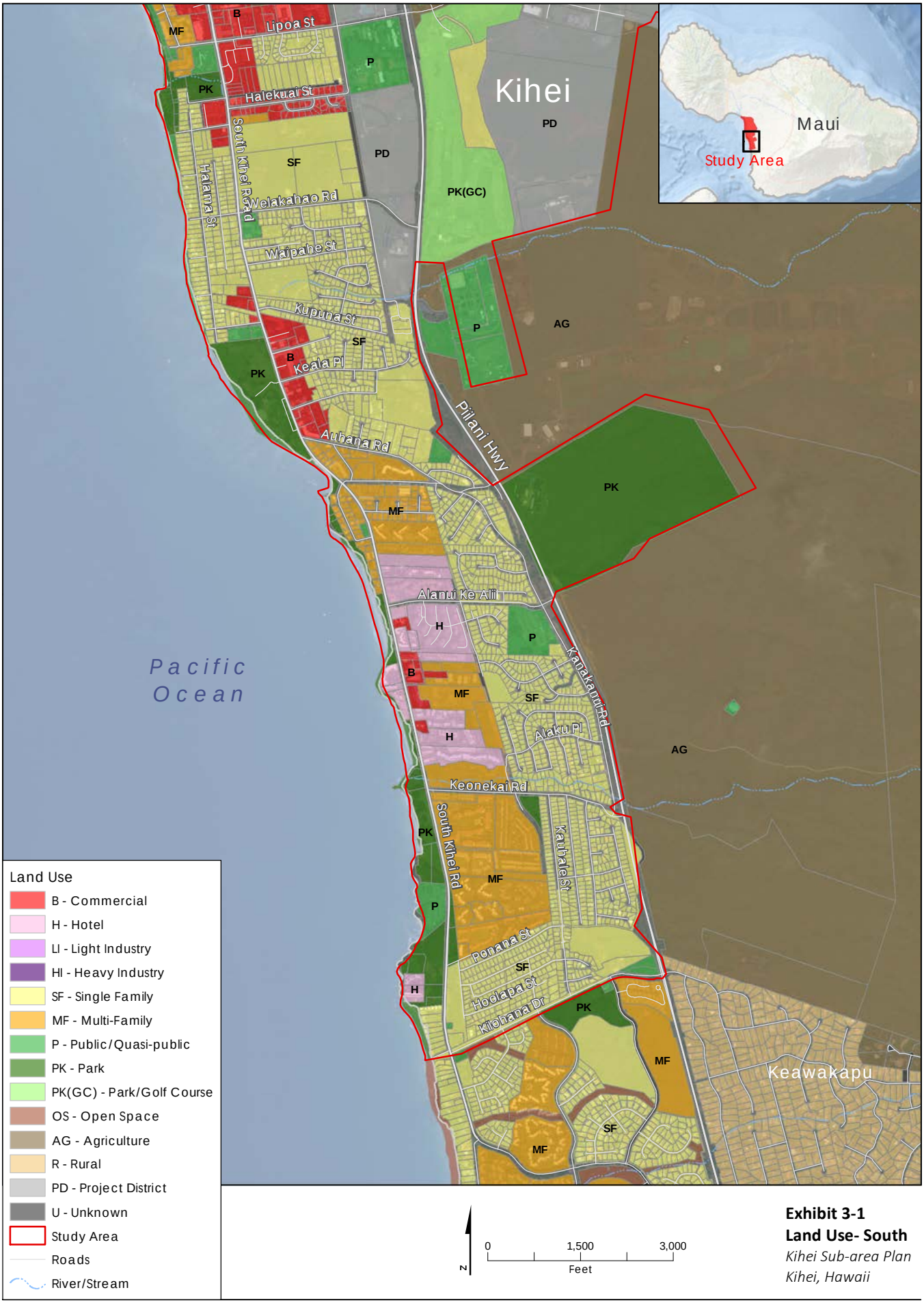



**Exhibit 3-1**
**Land Use- South**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

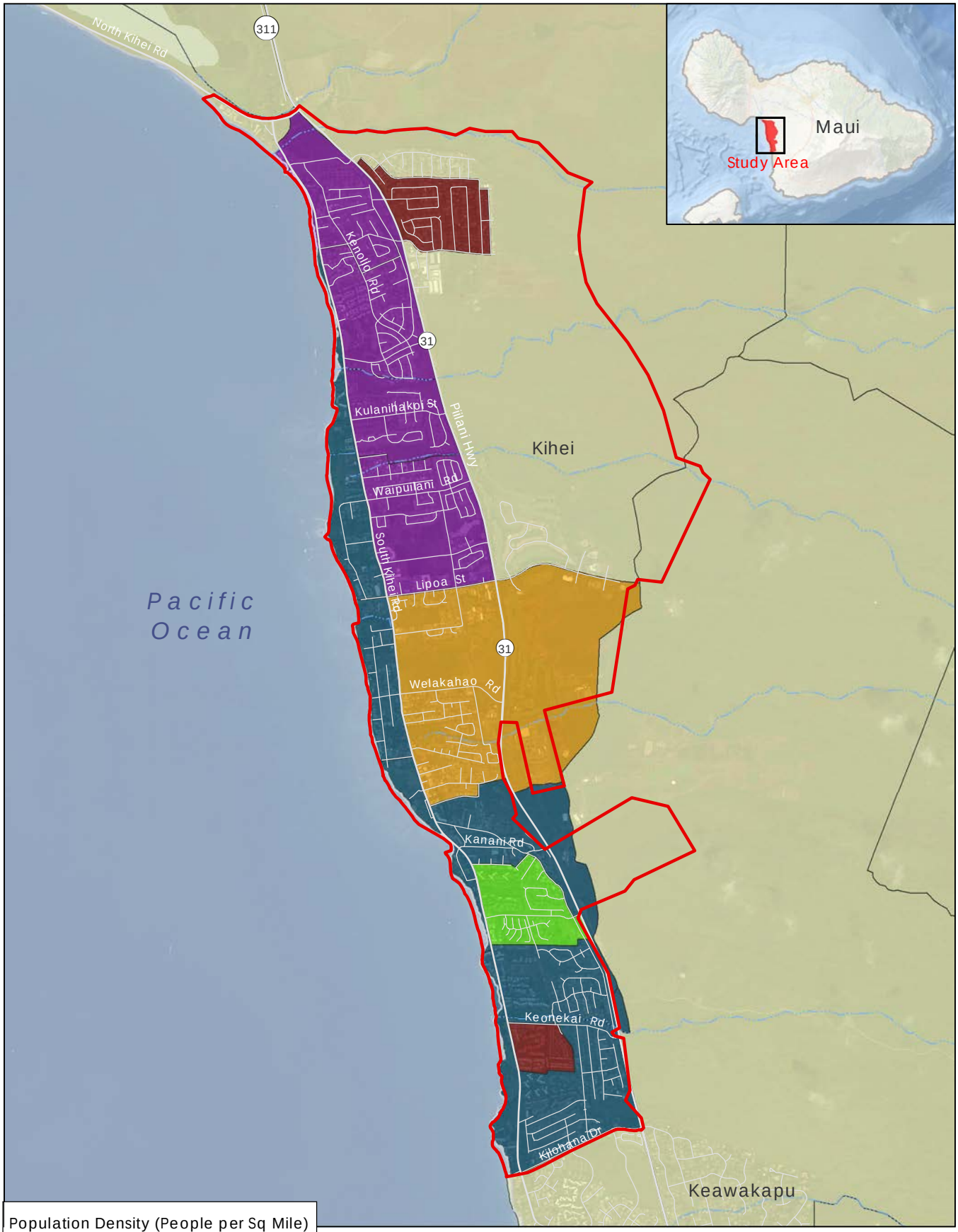



**Exhibit 3-2**
**Population Density**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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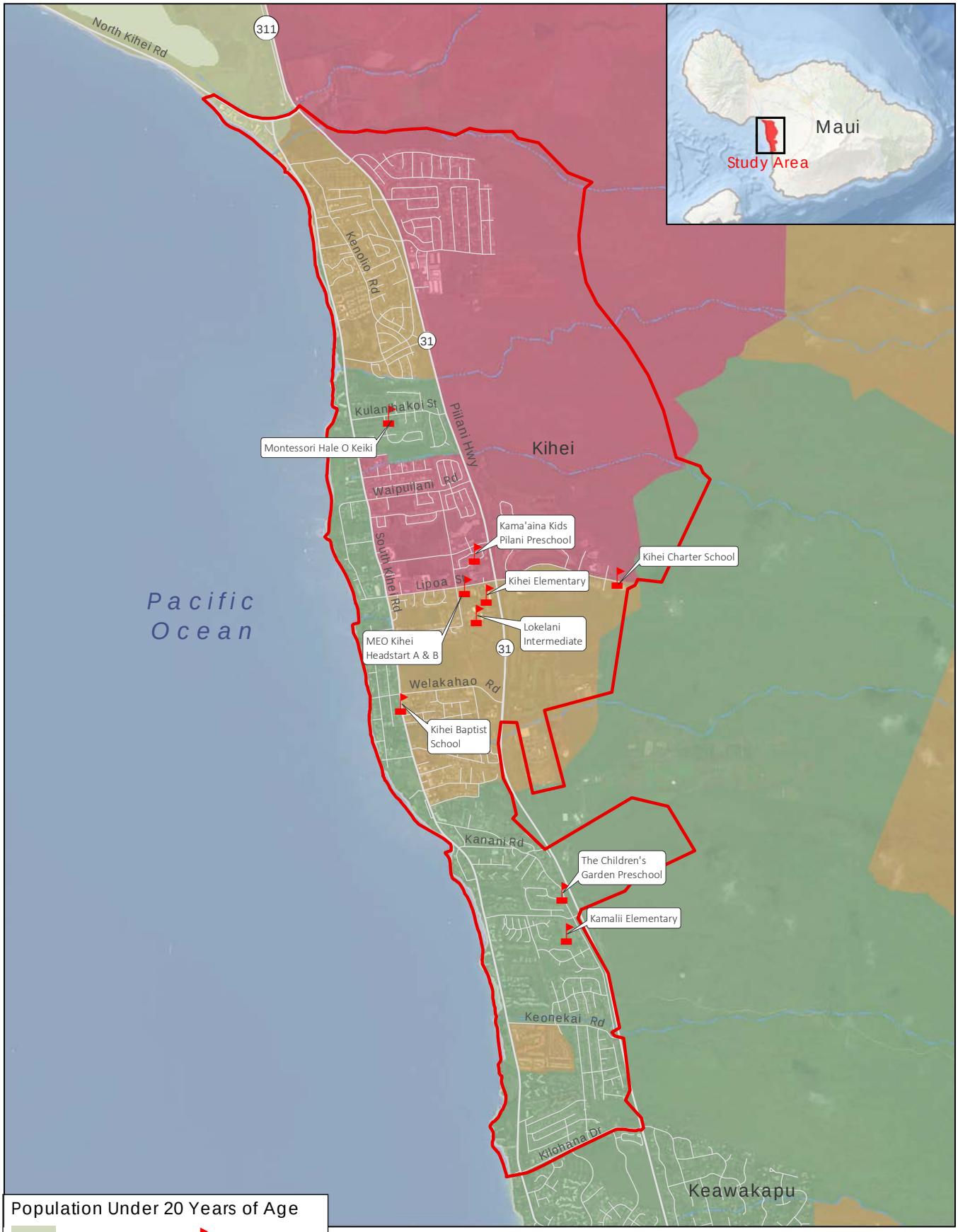


**Exhibit 3-3**
**Percent of Population Under 20 Years of Age**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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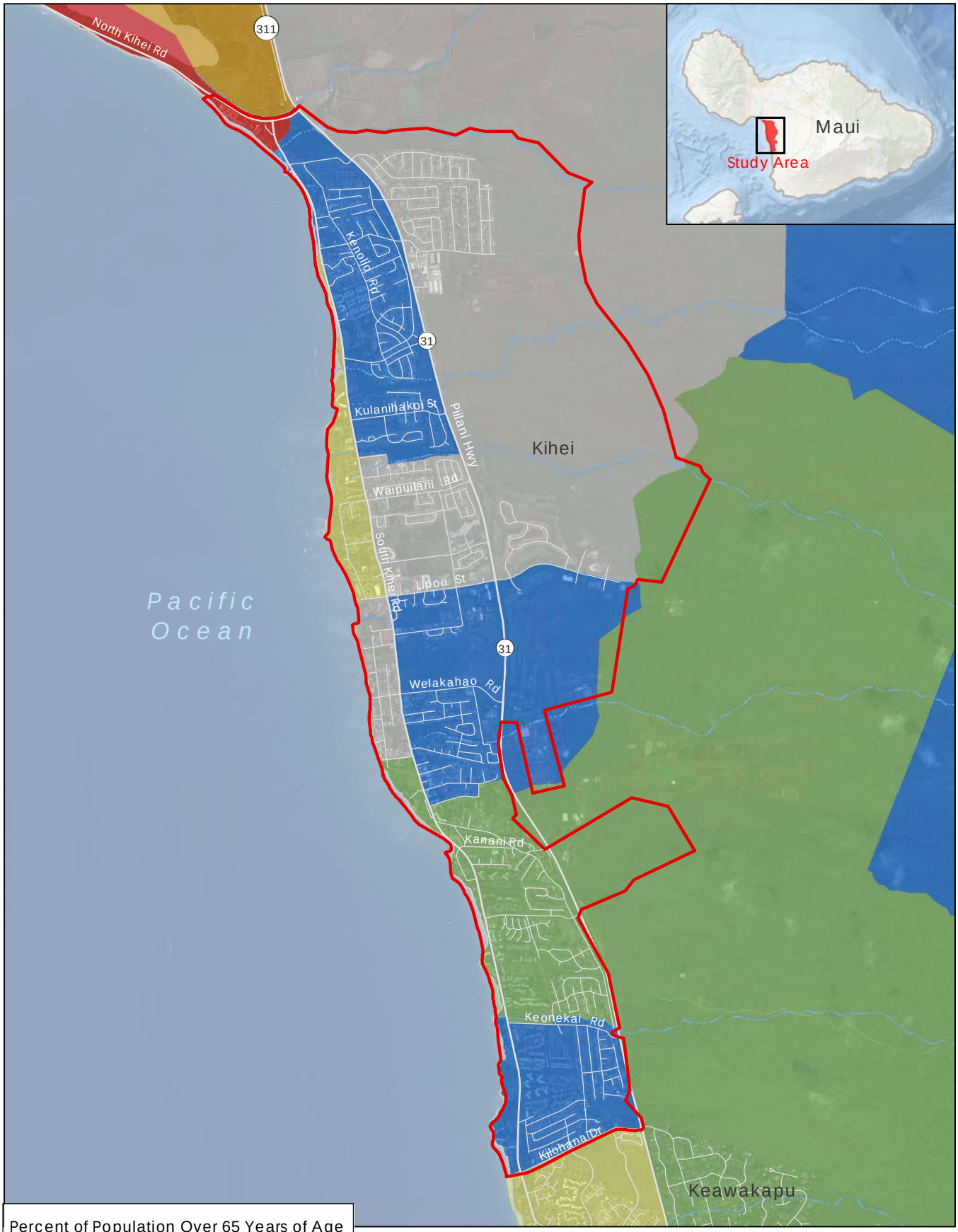


**Exhibit 3-4**
**Percent of Population Over 65 Years of Age**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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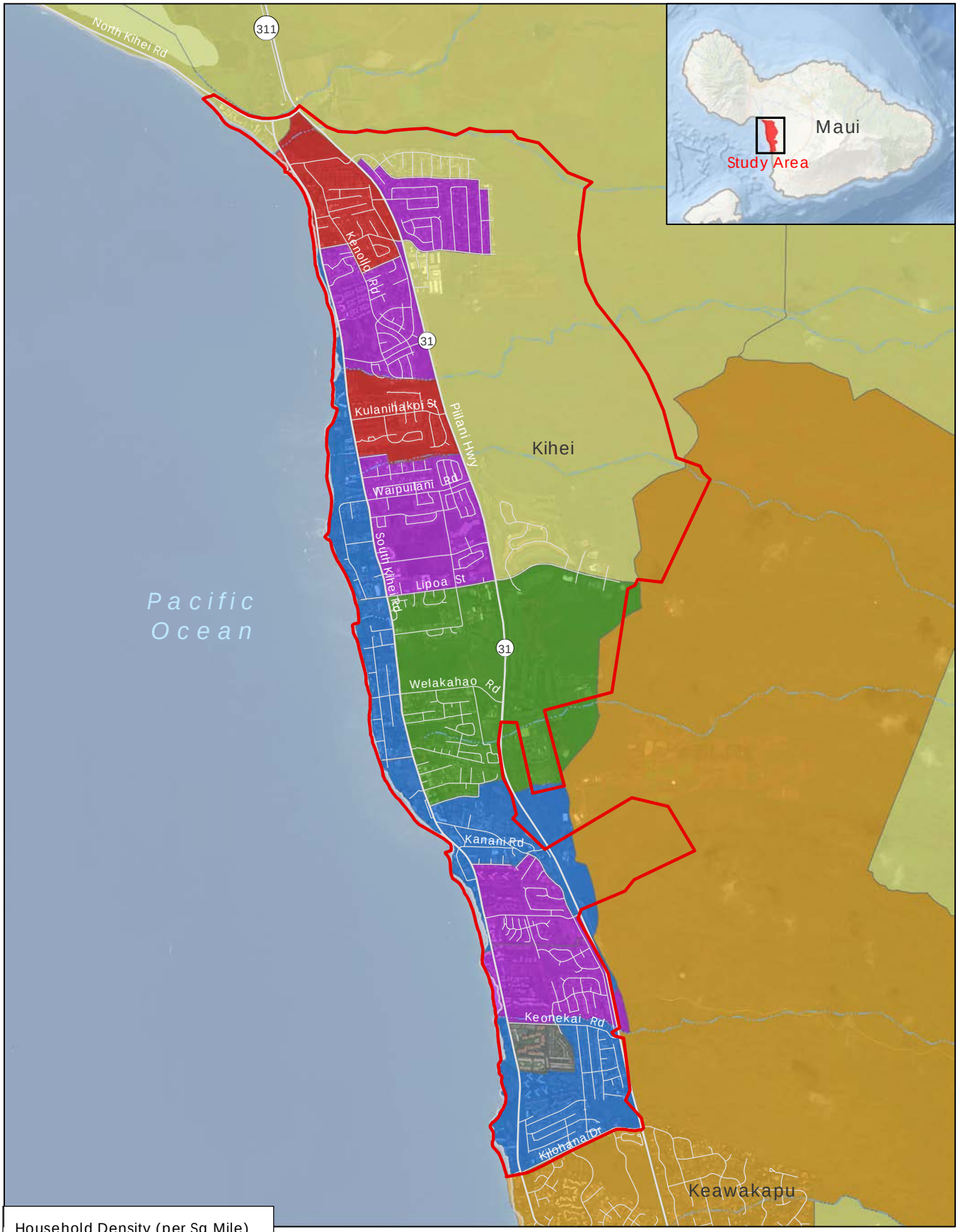


**Exhibit 3-5**
**Household Density**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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### 3.2.2.2 Households

Approximately 9,300 households are located within the study area, which represents approximately 19 percent of all households on Maui Island. The average number of persons per household in the study area is 2.6 persons, which is slightly less than the islandwide average of 3.0 persons per household. Exhibit 3-5 shows the household density in terms of households per square mile. While the distribution of household density is fairly uniform, isolated census block groups of densely spaced households (more than 3,000 households per square mile) are located at the northern end of the study area in zones designated for multi-family residential.

### 3.2.2.3 Projected Growth

Add discussion; coordinate with information being used by Planning Department for Kihei-Makena Plan update.

### 3.2.2.4 Employment

Census information for 2015 shows approximately 68,500 jobs on Maui Island; almost 7,400 of those jobs, or roughly 11 percent, were located in the Kihei study area (U.S. Census Bureau, 2016). Exhibit 3-6 shows the relative distribution of jobs within the study area, by traffic analysis zone (TAZ).

North of Lipoa Parkway within the Plan study area, there are approximately 4,100 total job positions. Roughly 2,200 of these positions are located *mauka* of Piilani Highway in areas zoned for light industrial, park/golf course, and project districts. There are multiple businesses along Ohukai Road, as well as recreational facilities and the Maui Research and Technology Park along Lipoa Parkway. *Makai* of Piilani Highway, there are nearly 1,900 job positions in areas zoned for hotel, commercial, and park land uses. Most of the jobs are located in the retail core between Waipuilani Road and Lipoa Street. This area includes land zoned for light industrial, park/golf course, and project districts and currently supports multiple businesses along Ohukai Road as well as recreational facilities and the Maui Research and Technology Park along Lipoa Parkway.

Other areas that support a relatively high number of jobs are the downtown retail core along Lipoa Street between South Kihei Road and Liloa Drive and the hotel and resort district along South Kihei Road between Kanani Road and Keonekai Road.

It should be noted that although it is not within the study area, the coastal TAZ within the Wailea resort area is adjacent to the study area, just south of Kilohana Drive, and contains almost double the total number of jobs than the highest total job TAZ in the study area. Wailea's residents, visitors, guests, freight handlers, and employees all heavily rely on the study area's transportation system.

### 3.2.2.5 Visitor Industry

The visitor industry is Maui's leading economic sector. Visitors to Kihei arrive on Maui Island via one of three airports or the commercial harbor. The island's primary airport, Kahului Airport, conveyed nearly 7 million air passengers in 2016. Other airports on Maui are located in Kapalua and Hana, which conveyed over 75,000 air passengers and approximately 4,000 air passengers, respectively, during 2016 (HDOT, 2016).

Kahului Commercial Harbor supports the visitor industry through cruise ship accommodations. The Hawaii Tourism Authority reported that nearly 220,000 cruise ship passengers were accommodated at Kahului Commercial Harbor in 2016 (Hawaii Tourism Authority, 2017a).

In 2016, there were approximately 300 properties in the Wailea/Kihei area, providing over 8,750 visitor accommodations (rooms or individual units). The majority of these were hotel rooms (where amenities include daily housekeeping services and onsite features such as pools and restaurants) and vacation rental units (which generally contain in-unit kitchens and laundry facilities but seldom offer housekeeping services) (Hawaii Tourism Authority, 2017b).

Within Kihei, visitors have access to recreational activities at multiple beaches, local and regional parks, and the Maui Nui Golf Course. Kihei also offers a network of walking and biking trails. Visitors to Maui Island often travel through Kihei to reach additional tourist attractions and visitor accommodations in Wailea and Makena.

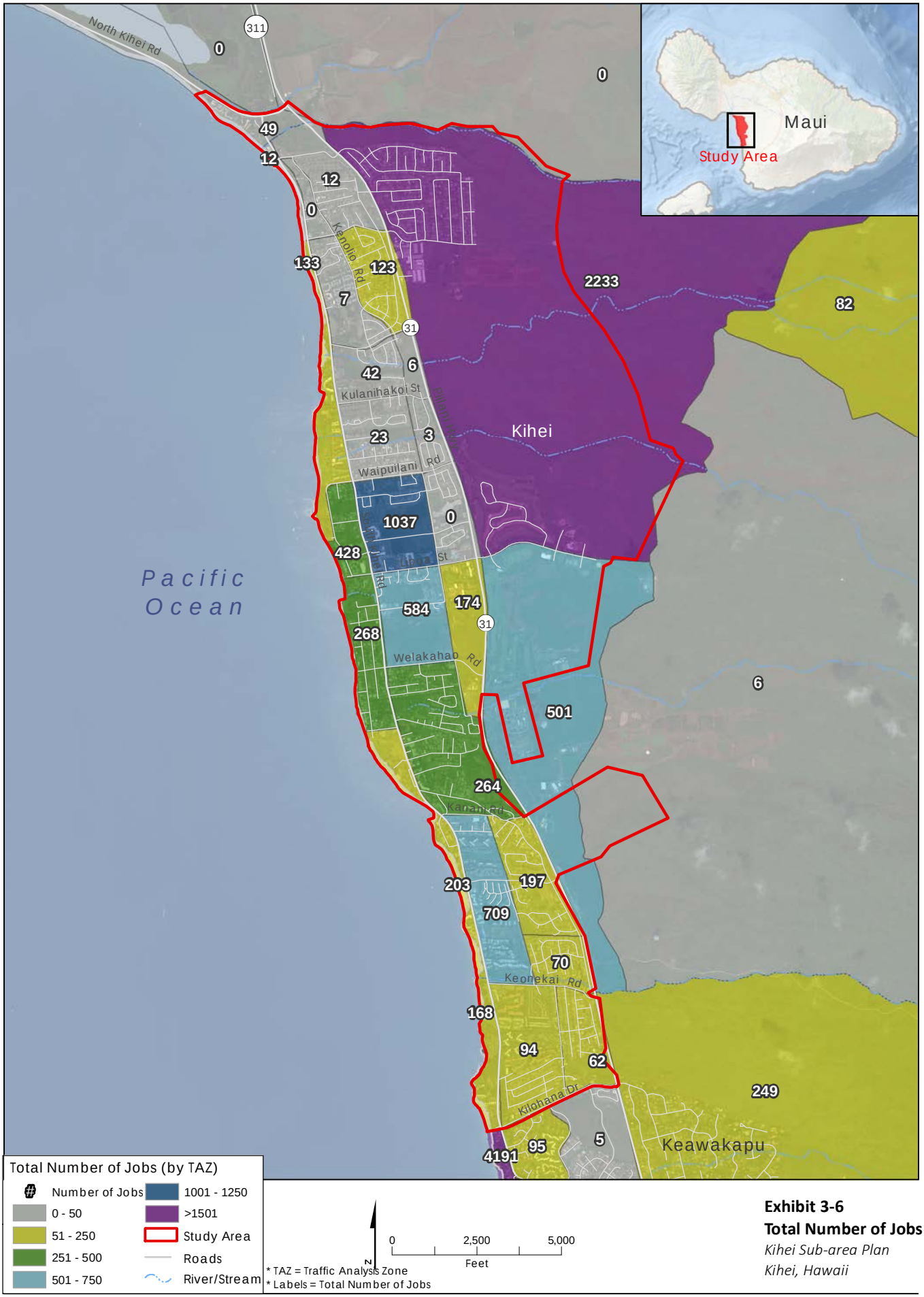



**Exhibit 3-6**
**Total Number of Jobs**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

## 3.2.3 Land Transportation System Conditions

The existing transportation system within the study area consists 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.

### 3.2.3.1 Roadway Network

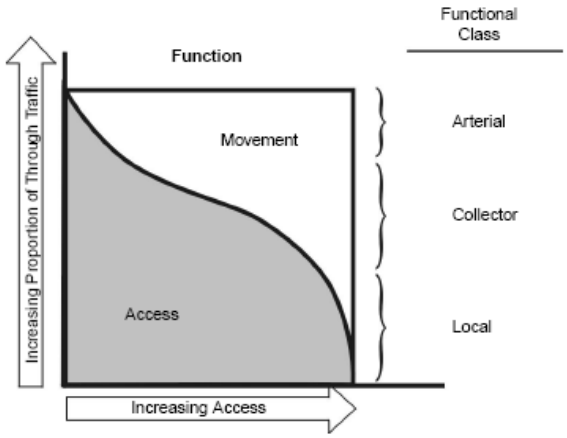
The existing roadway network supports the movement of people and goods in and around Kihei. All modes of land transportation, including vehicles, bicycles, pedestrians and transit, use the roadway system.

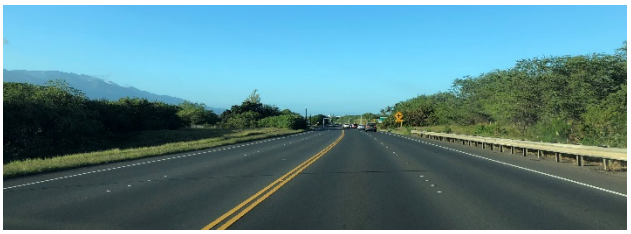
Within the study area, roadways can generally be categorized as one of the following:

- Arterial – roadways of regional importance that are intended to serve higher 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 adjacent properties.
- Local – roadways that are intended to provide access to adjacent properties. They tend to accommodate lower traffic volumes, serve trips over shorter distances, and provide connections to collector streets.

The Transportation Research Board *Access Management Manual* (2003) shows the relationship between movement and access for the three roadway types in Exhibit 3-7. Arterials are characterized with greater emphasis on movement of traffic, while local roadways have higher emphasis on property access.

Exhibit 3-7. Existing Roadway System Classifications, Transportation Research Board



*Piilani Highway is a principal arterial.*

Exhibit 3-8 shows the functional classification of roadways within the study area. Piilani Highway (Route 31) is a state-owned, north-south, limited access facility that connects Mokulele Highway (Route 311) and North Kihei Road (Route 310) to Makena and Wailea in South Maui.

Within the study area, Piilani Highway is a four-lane urban principal arterial (two general purpose travel lanes in each direction) with dedicated turn lanes at traffic signals and select cross streets. The posted speed limit is 40 miles per hour.

The roadway has paved shoulders, and as a designated signed shared road, bicycles are allowed to travel on the highway.

South Kihei Road is a county-owned, north-south roadway classified as an urban major collector. This collector road provides regional mobility along the South Maui coast as an alternative to Piilani Highway. It also provides a high level of local access to adjacent land uses via many driveways and intersections.

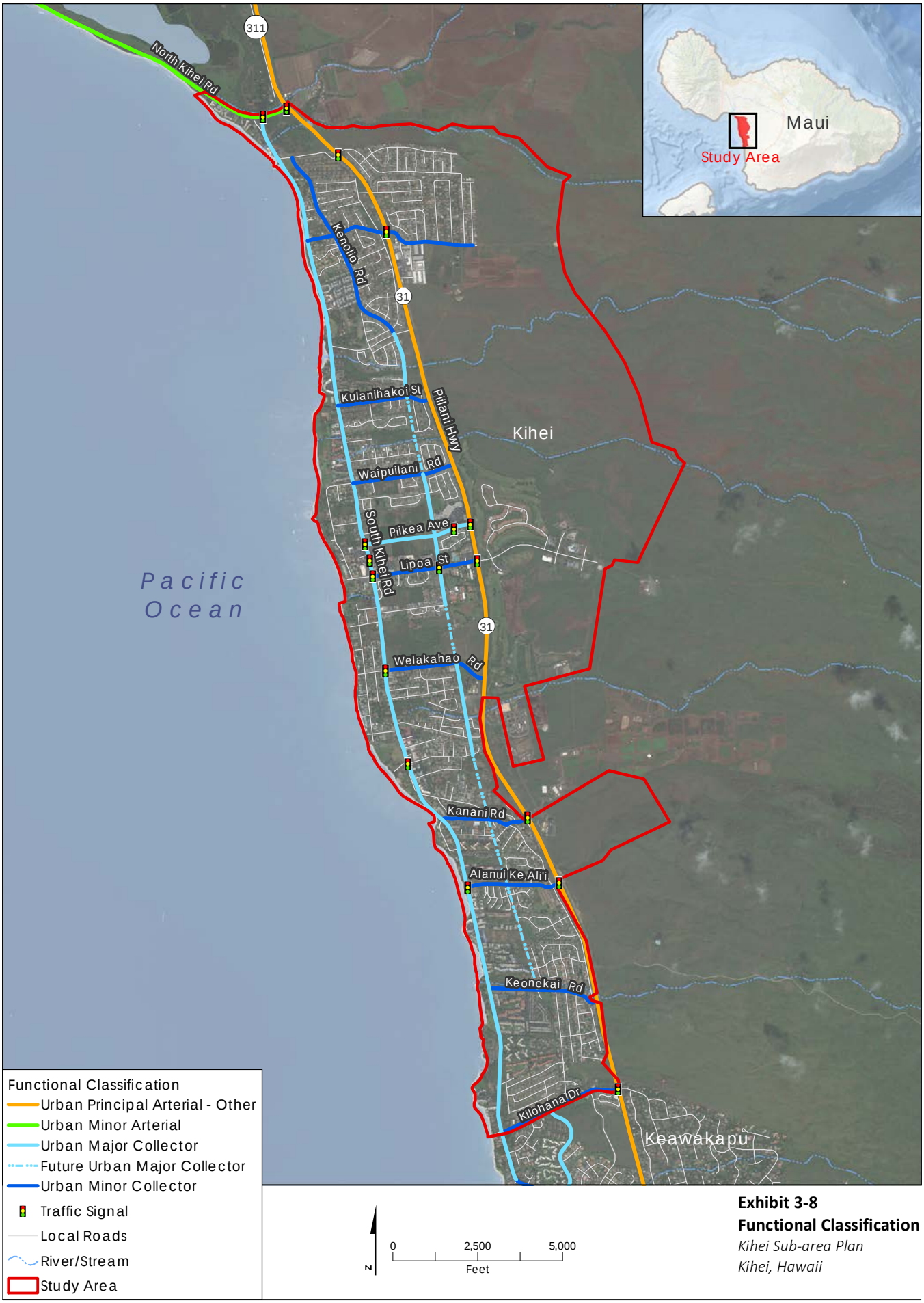



**Exhibit 3-8**
**Functional Classification**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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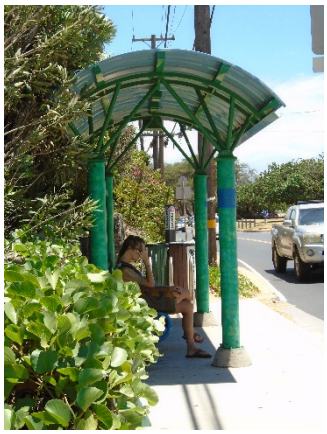


South Kihei Road has one lane in each direction for most of its length within the study area, with turn lanes at select intersections. For a short portion in the downtown core from just north of Piikea Avenue through Azeka Shopping Center, the roadway widens to two lanes in each direction, with turn lanes. The posted speed limit is 30 miles per hour for most of its length, except at the Kulanihakoi Gulch, where the posted speed limit is reduced to 10 miles per hour.

*Alanui Ke Alii Drive is a mauka-makai collector.*

### 3.2.3.2 Public Transit System

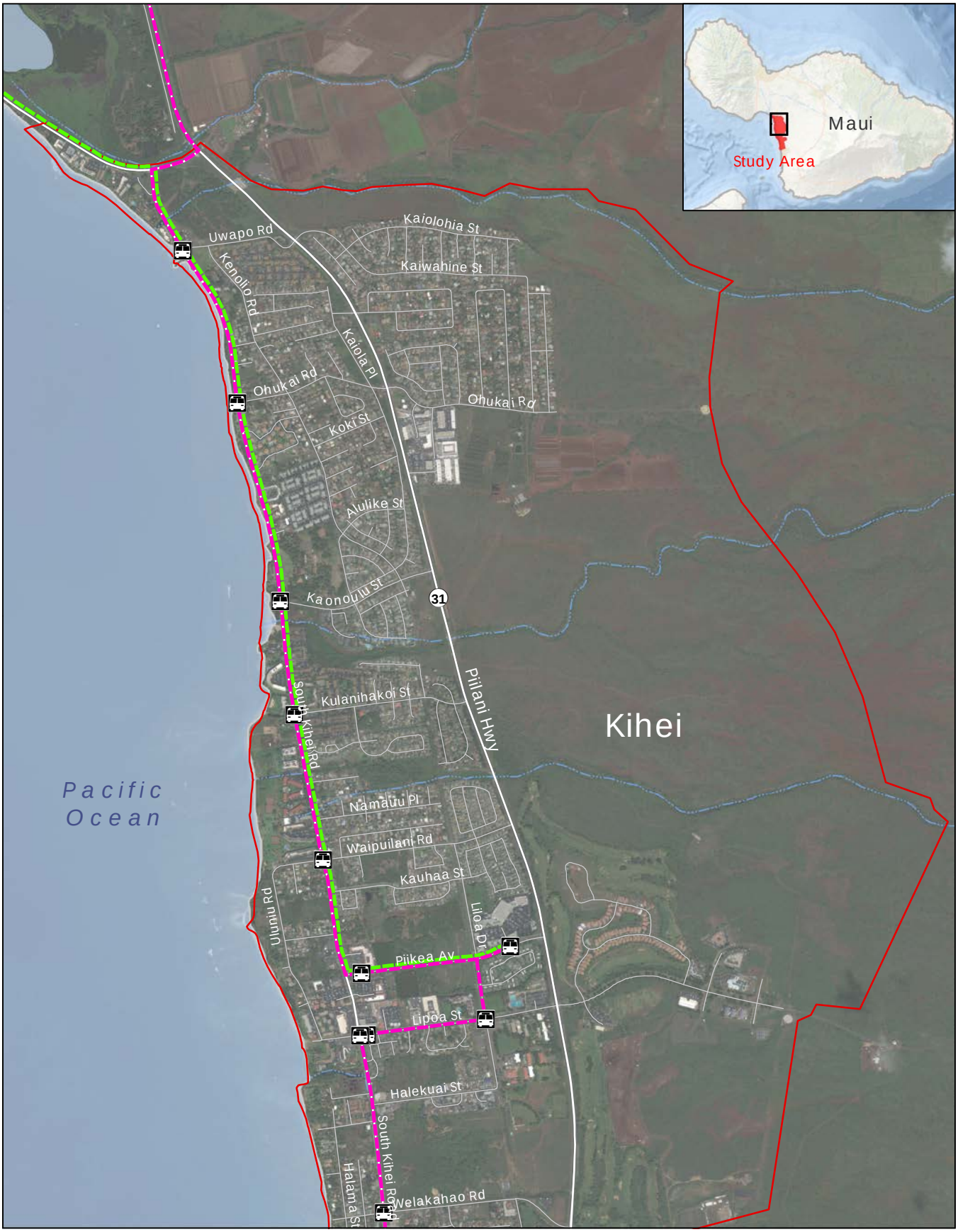
Public transit provides an option and opportunity for personal mobility, regardless of age, income, or social or physical status. It offers a modal alternative for those who are unable to or choose not to drive. Public transit also contributes to quality of life benefits through reduced traffic congestion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

On Maui Island, public transit services are provided by Maui Bus (operated by the County Department of Transportation) and include fixed-route transit service, commuter service, and advanced reservation curb-to-curb paratransit service. Exhibit 3-9 shows the existing transit system within the study area.

The Kihei Islander Route #10 provides round-trip transit service between Kahului and Wailea via Mokulele Highway and South Kihei Road. Routes run daily (including weekends and holidays), with hourly departures from Kahului between 5:30 a.m. and 7:30 p.m. and from Wailea between approximately 6:30 a.m. and 8:30 p.m. This route provides access to resorts, parks, and the downtown shopping/retail core along the entire length of South Kihei Road, with designated bus stops spaced approximately 0.5 mile apart. It also provides access to the Piilani Village Shopping Center, where transfers can be made to the Kihei Villager Route #15, and serves a limited number bus stops on Piikea Avenue and South Kihei Road.

The Kihei Villager Route #15 provides round-trip transit service between Maalaea Harbor Village and Piilani Village Shopping Center in Kihei. Service to Kihei runs hourly between 6 a.m. and 8 p.m.; return service from Kihei operates hourly between approximately 5:30 a.m. and 8:30 p.m. The route operates on this schedule each day of the week, including weekends and holidays. Because this route overlaps with a portion of the Kihei Islander Route #10, transit service on South Kihei Road between North Kihei Road and Piikea Avenue—in both directions—can be offered with approximately 30-minute headways.


Maui Bus commuter service operates during the morning and afternoon peak commute periods only, with limited transit trips in a single direction between residential areas and hotel and resort areas. The Kihei-Kapalua Commuter route includes one transit trip in the morning beginning at South Kihei Road at Kilohana Street. The route travels northbound, making pick-ups at all bus stops on South Kihei Road, before traveling on North Kihei Road and Honoapiilani Highway to various hotels and resorts in Kaanapali and Kapalua. One return trip is offered in the afternoon from Kapalua to Kihei.




Bus Transit Route
- Kihei Islander #10
- Kihei Villager #15
- Bus Stop

Roads
River/Stream
Study Area

N
0 1,500 3,000
Feet

**Exhibit 3-9**
**Transit Routes - North**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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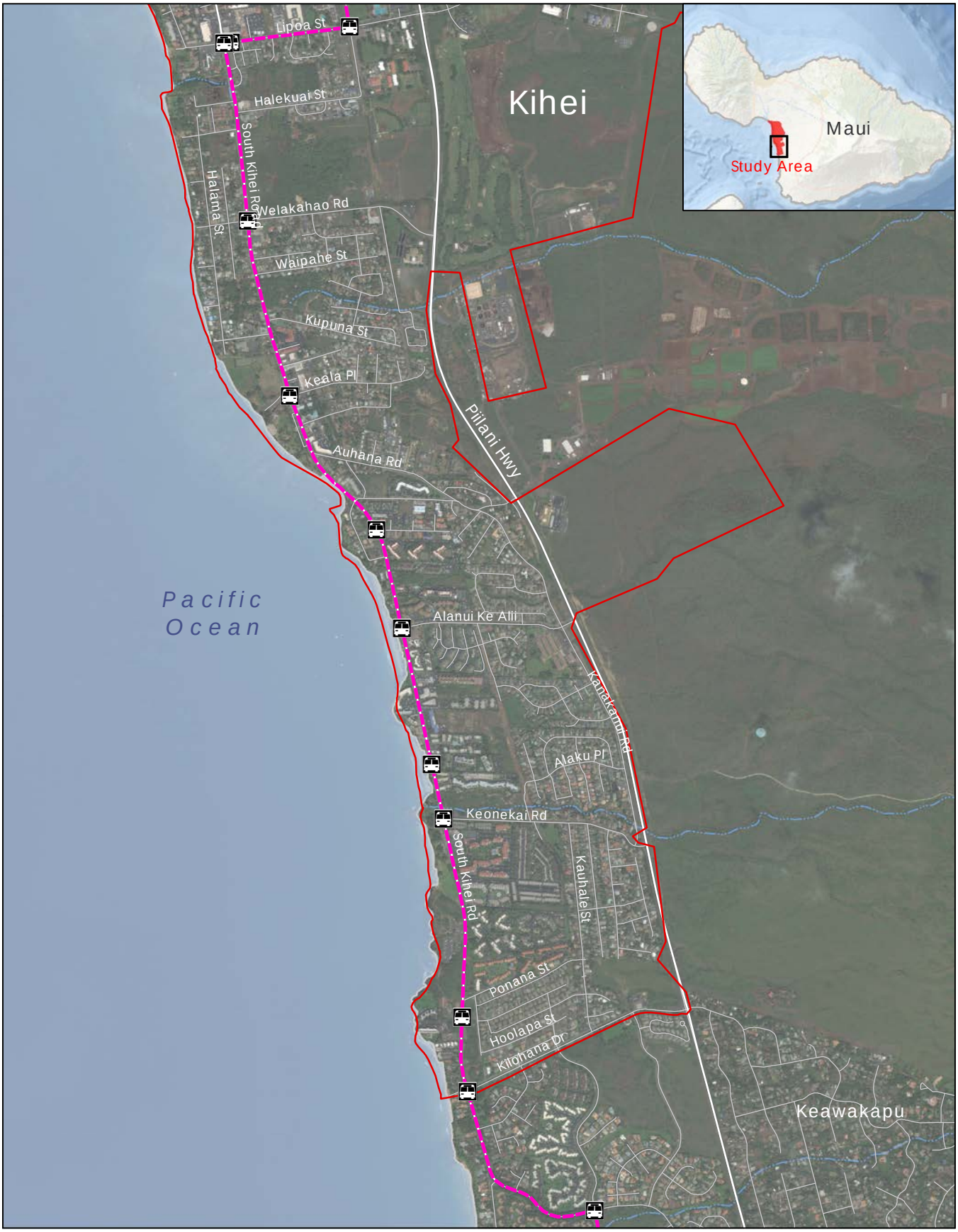



Bus Transit Route
Kihei Islander #10
Bus Stop

Roads
River/Stream
Study Area

N

0 1,500 3,000
Feet

**Exhibit 3-9**
**Transit Routes - South**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

The Haiku-Wailea Commuter route provides one transit trip in the morning from the Haiku Community Center to hotels and resorts in Wailea. This route travels on Piilani Highway through Kihei, making one stop at the Piilani Village Shopping Center, before reaching Wailea. One reverse transit trip is offered in the afternoon.

Transit service frequency and hours of service are summarized in Exhibit 3-10.

Exhibit 3-10. Transit Service Summary

| Route Name | Route Number | Route Description | Hours of Service | Service Frequency | Average Monthly Ridership[a] |
|---|---|---|---|---|---|
| Kihei Islander | 10 | Kahului to Wailea<br>Wailea to Kahului | 5:30 a.m. – 7:30 p.m.<br>6:30 a.m. – 8:30 p.m. | 60 minutes | 24,100 passengers |
| Kihei Villager | 15 | Maalaea to Kihei<br>Kihei to Maalaea | 6:00 a.m. – 8:00 p.m.<br>5:30 a.m. – 8:30 p.m. | 60 minutes | 5,500 passengers |
| Kihei-Kapalua Commuter | n/a | Kihei to Kapalua<br>Kapalua to Kihei | 6:15 a.m.<br>4:05 p.m. | One trip only | 660 passengers |
| Haiku-Wailea Commuter | n/a | Haiku to Wailea<br>Wailea to Haiku | 5:30 a.m.<br>4:15 p.m. | One trip only | 890 passengers |

Source: County of Maui, 2017

[a] Ridership reported for fiscal year 2017 (July 2016 through June 2017).

n/a = not applicable

Paratransit service is available to qualified individuals (including seniors and persons with disabilities) who are unable to use fixed-route Maui Bus public transit. Advanced reservations for curb-to-curb paratransit service is required. Multiple pick-ups and drop-offs can be scheduled on the same day for individuals with several trip purposes. This service operates during the same days and hours as fixed-route service and is limited to areas within 0.75 mile of a transit route.

Maui Economic Opportunity, Inc. (MEO) is a nonprofit organization that provides transportation services to qualified participants on Maui with the aim of improving their economic stability. MEO provides service to the doctor, work, school, and adult daycare and access to a rural shopping shuttle through a variety of grant-funded programs. Services are generally provided for low-income individuals and families, seniors, youth, and people with disabilities or those with medical needs.

### 3.2.3.3 Bikeway System

Bike Plan Hawaii (2003) lists and illustrates three types of bike facilities (excluding unsigned shared roadway): signed shared roadway, bike lane, and shared-use path. These bike facilities are defined as follows and illustrated in Exhibits 3-11 through 3-13:

- Signed Shared Roadway (Exhibit 3-11) – a street or highway that is specifically designated by signs as a preferred route for bicycle use. This type of facility typically features curb lanes that are at least 14 feet

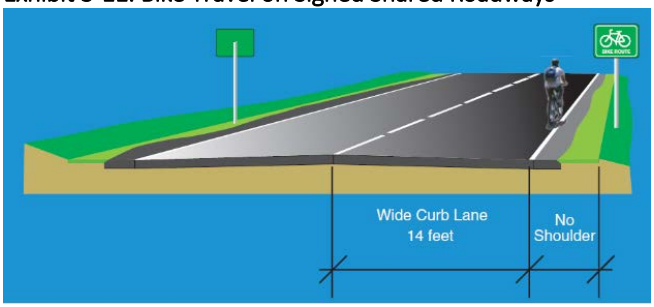
wide with no shoulder, or lanes with standard widths and a minimum 4-foot paved shoulder.

- Bike Lane (Exhibit 3-12) – a section of roadway that has been designated by striping, signing, and/or pavement markings for the preferential or exclusive use by bicyclists. This type of facility features dedicated bike lanes, with minimum 4-foot width, adjacent to a motor vehicle travel lane with or without on-street parking.
- Shared-use Path (Exhibit 3-13) – a bikeway that is physically separated from motorized vehicular traffic by an open space or barrier and is either within the highway right-of-way or has an independent right-of-way. This type of facility features, under most conditions, a paved bikeway with 10-foot width for two-directional shared use.

As shown in **Exhibit 3-14**, the existing bikeway system within the study area consists of all three of these types of bike facilities, owned by different agencies. A state-owned signed shared roadway exists along the entire segment of Piilani Highway (Route 31) within the study area.

Multiple county-owned bike lanes exist at different locations: South Kihei Road from Ohukai Road to north of Kilohana Drive, portions of Kenolio Road, Kanounolu Street from Alulike Street to Piilani Highway, and three west-east streets connecting South Kihei Road and Piilani Highway (Kulanihakoi Street, Lipoa Street, and Alanui Ke Alii Drive). A shared-use path providing access to Kihei Regional Park exists along Liloa Drive between Waipuilani Road and Halekuai Street just south of Lokelani Intermediate School.

Exhibit 3-11. Bike Travel on Signed Shared Roadways



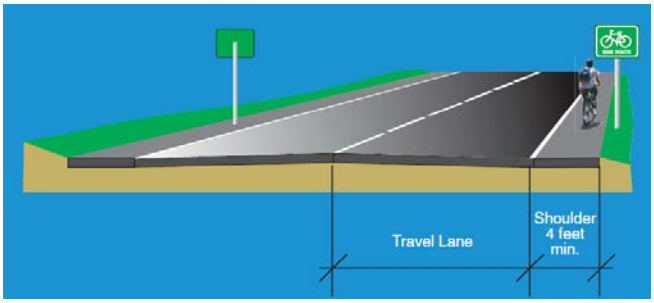
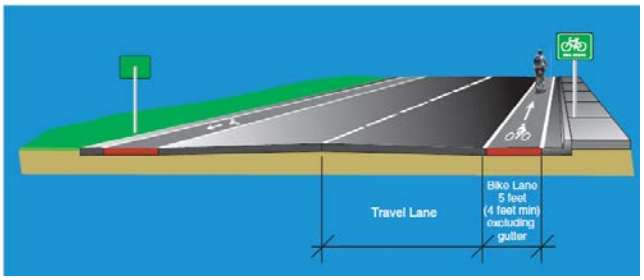
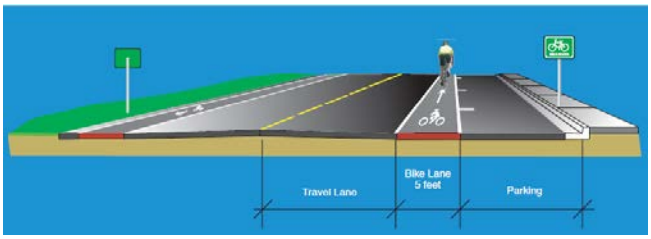




Exhibit 3-12. Bike Travel via Bike Lane




*Bike lane on South Kihei Road.*

Exhibit 3-13. Bike Travel on Shared-use Path


SOURCE: HDOT, 2003

*Portion of the greenway along Liloa Drive.*

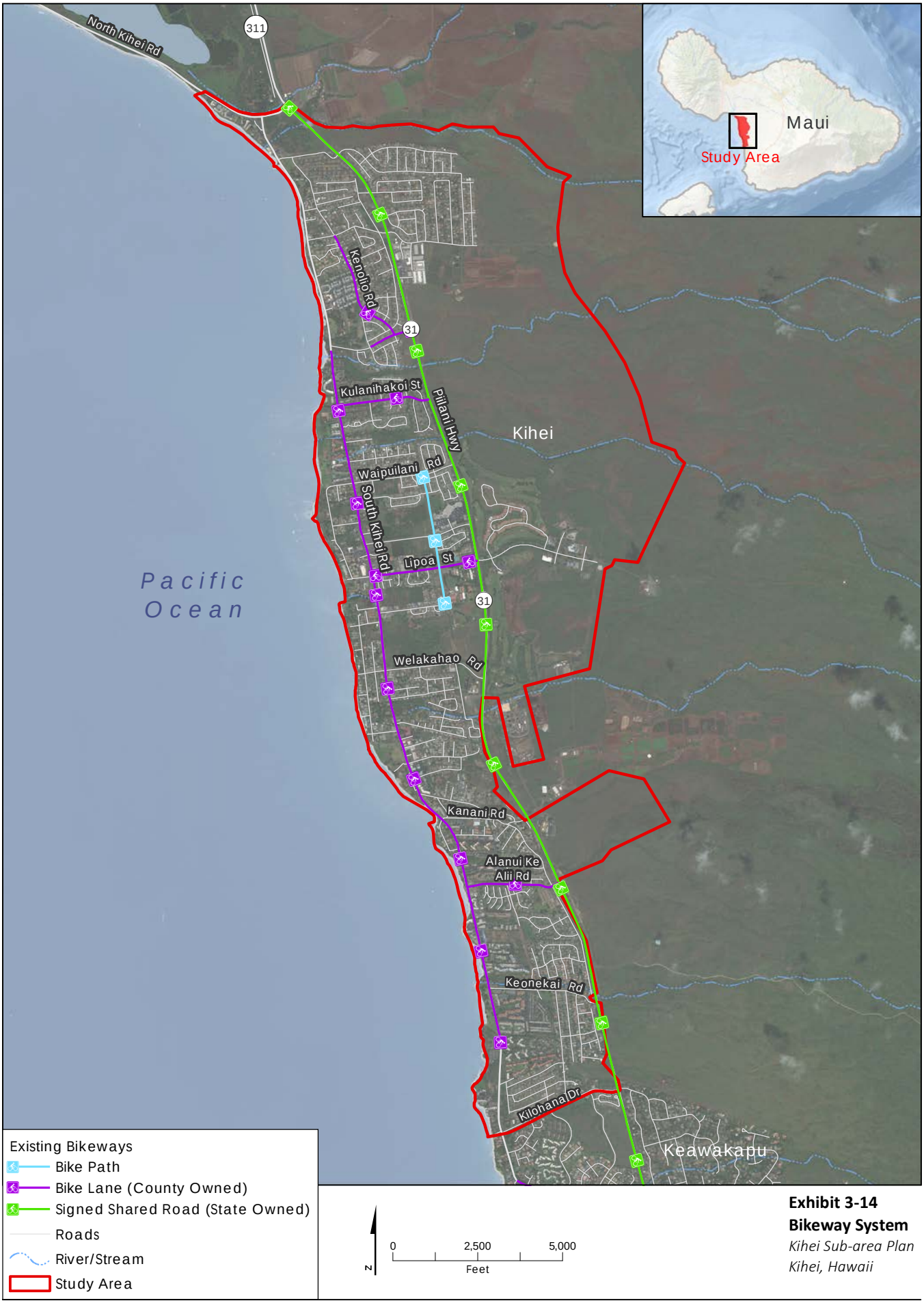



**Exhibit 3-14**
**Bikeway System**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

UNK \\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\M\MAUI_COUNTY\KIHEI_SUBAREA_PLAN\MAPS\REPORT\KIHEISUBAREAPLAN_BIKEWAY_SYSTEM.MXD SJ063666 11/25/2019 10:50:18 AM

### 3.2.3.4 Pedestrian System

As described in the Statewide Pedestrian Master Plan (HDOT, 2013), sidewalks serve as important connectors for pedestrian trip generators. Every trip typically begins and ends with a pedestrian trip. In areas with dense pedestrian movements, sidewalks on both sides of the street are often desired to ensure safety as well as high level of service. Occasionally, sidewalks are present on one side of the street only: when streets have higher origin-destination trips on one side compared to the other, when physical limitations within the right-of-way prevent sidewalks on both sides, and when safety can be improved at locations with no sidewalk previously. In some rural areas with less pedestrian density, shoulders, though not formally recognized as a pedestrian facility, are often used by pedestrians.

As shown in **Exhibit 3-15**, existing pedestrian facilities in the study area are mostly provided by sidewalks on one side of the street in residential areas. Many streets have sidewalks that only exist for short distances rather than throughout the length of the road. Along the major north-south routes throughout the study area, Piilani Highway has no sidewalks.

*Pedestrians on South Kihei Road, where there is sidewalk on both sides of the street.*

Sidewalks are provided on one or both sides of the roads on certain segments of South Kihei Road but are not continuous for the length of the study area. South Kihei Road has sidewalks on one side of the street periodically in the following places: between Ohukai Road and Nohokai Street, between Kaonoulu Street and Namauu Place, between East Lipoa Street and Halekuai Street, and south of Keonekai Road to approximately Ala Koa Street. There are sidewalks on both sides of South Kihei Road between north of Piikea Avenue and Lipoa Street in the downtown retail core and from north of Halekuai Street to just south of Keonekai Road. As noted, there are multiple sidewalk gaps along South Kihei Road.

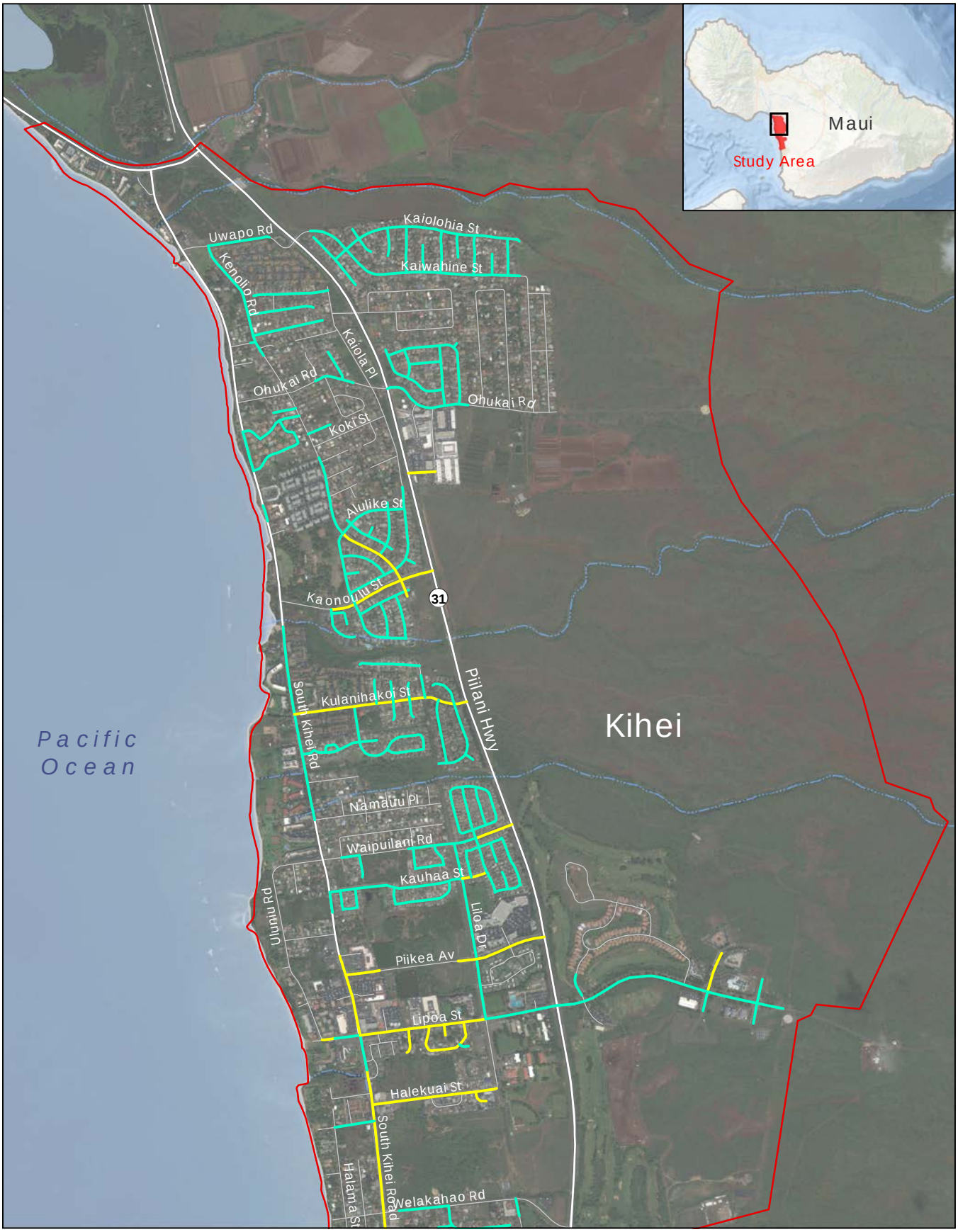
*Pedestrian walking along South Kihei Road, where there are no sidewalks.*

Only two *mauka-makai* streets connecting Piilani Highway with South Kihei Road – Kulanihakoi Street and Alanui Ke Alii Drive – have sidewalks on both sides of the street, continuously, for the length of the roadway. Kanani Road, which connects Auhana Road and Kanakakui Road, also provides *mauka-makai* access and has sidewalks on at least one side of the street continuously to Alaku Place.

On Uwapo Road, Ohukai Road, and Welakahao Road, there are portions of sidewalk on one side of the street. Kaonoulu Street, Piikea Avenue, and Kilohana Drive each have sections of the street with sidewalks on both sides. Waipuilani Road, Lipoa Street, and Auhana Road have various sections with a mix of sidewalk configurations; some sections have sidewalks on both sides while other sections have sidewalk on just one side of the street.

### 3.2.3.5 Freight System

Freight mobility is critical to the economic vitality of Maui. Although there are no specified freight routes on the island, freight activities are concentrated around the commercial harbor (that is, Kahului Harbor) and use many of the arterial roadways to transport goods to markets throughout the islands. From the harbor, freight vehicles transporting goods to Kihei and Makena primarily use Mokulele Highway to reach the study area. Freight vehicles could also use Kuihelani Highway to North Kihei Road as an alternative route to the study area.




Pedestrian System
- Sidewalk Both Sides
- Sidewalk One Side

Roads
River/Stream
Study Area

N

0 1,500 3,000
Feet

**Exhibit 3-15**
**Pedestrian System - North**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

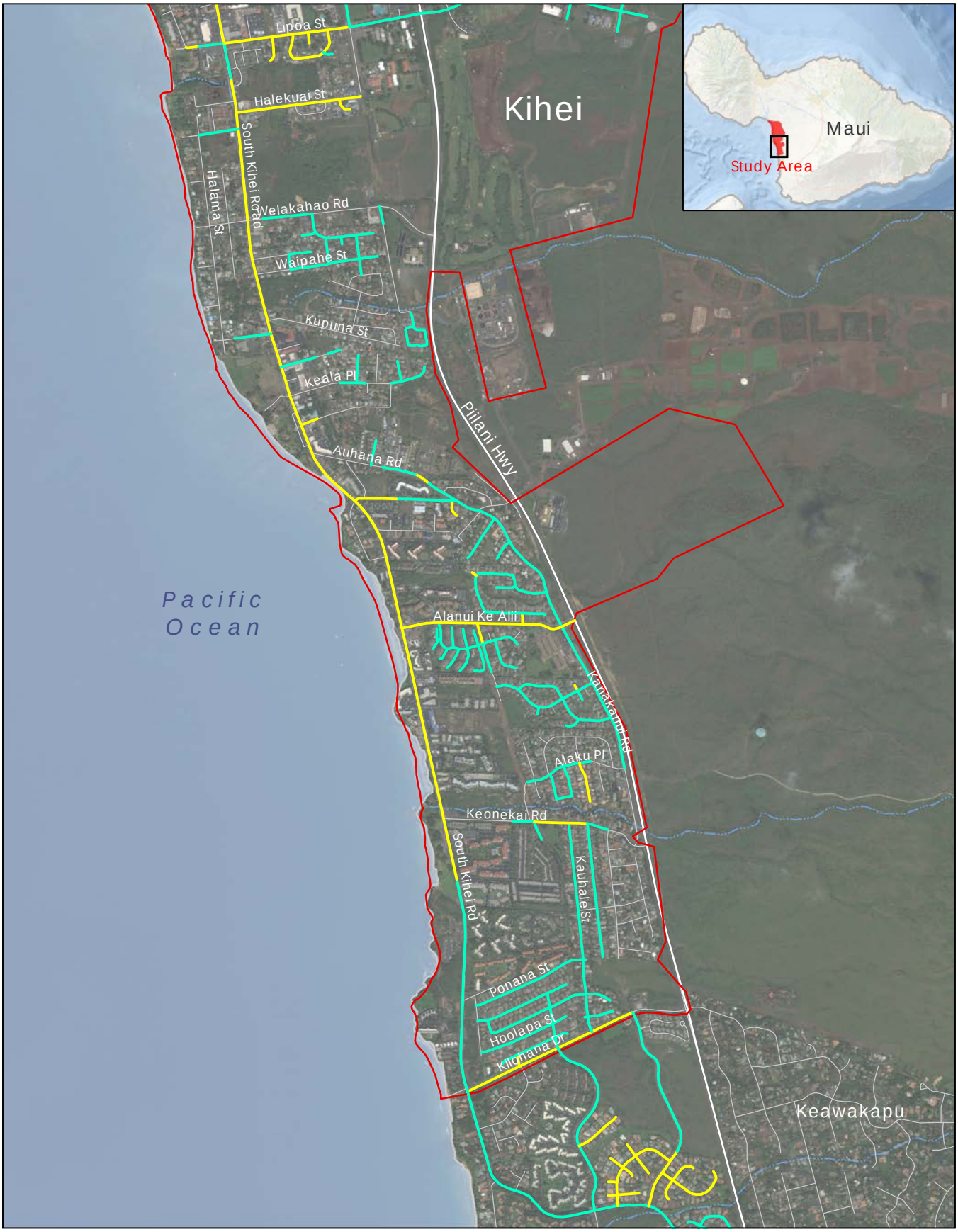



**Exhibit 3-15**
**Pedestrian System - South**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

### 3.2.3.6 Traffic Operations and Performance

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

### 3.2.3.7 Vehicular Travel Patterns and Volumes

The most recent traffic volumes available from the HDOT were collected in 2014 and 2015 along state and local roadways within Kihei. Average daily traffic volumes on Piilani Highway between Kaonoulu Street and Kulanihakoi Road are in the range of approximately 19,000 vehicles per day in each direction. During the morning commute, volumes in the southbound direction peak at approximately 1,650 vehicles per hour (at 7:15 a.m. to 8:15 a.m.). Northbound vehicles peak at approximately 1,250 vehicles per hour. Afternoon traffic volumes on Piilani Highway are highest between approximately 3:15 p.m. to 4:15 p.m., with roughly 1,500 vehicles per hour traveling northbound and 1,600 vehicles per hour traveling southbound.

Within Kihei, South Kihei Road at Piikea Avenue carries approximately 11,000 vehicles per day, combined in both directions. Peak hour volumes in the morning are generally in the range of approximately 200 vehicles per hour (both directions combined); in the evening traffic volumes peak at just over 700 vehicles per hour. Volumes on South Kihei Road gradually decrease further south towards Kilohana Drive. Traffic volumes on study area roadways are summarized in Exhibit 3-16.

Exhibit 3-16. Existing Daily Vehicle Volumes by Direction

| Roadway Location | Count Year | Southbound/ Westbound Vehicle Volume | Northbound/ Eastbound Vehicle Volume |
|---|---|---|---|
| Piilani Highway, Between Kaonoulu Street and Kulanihakoi Road | 2015 | 19,450 | 19,000 |
| South Kihei Road, Between Nohokai Street and Piikea Avenue | 2015 | 5,900 | 5,100 |
| South Kihei Road, Between Kilohana Drive and Waikai Street | 2014 | 4,100 | 4,050 |
| Kenolio Road, Between Koki Place and Kuilima Place | 2014 | 1,200 | 1,200 |
| Kilohana Drive, Between Kauhale Street and Wailea Alanui Drive | 2015 | 1,700 | 1,650 |
| Keonekai Road, Between Alaku Place and South Kihei Road | 2015 | 1,750 | 1,650 |
| Alanui Ke Alii Drive, Between South Kihei Road and Kenolio Road | 2015 | 2,400 | 3,200 |
| Kanani Road, Between Halona Street and Auhana Road | 2015 | 2,000 | 1,850 |
| Kanani Road, Between Auhana Road and Kanoe Street | 2015 | 1,050 | 1,000 |
| E Welakahao Road, Between Akai Street and Liloa Drive | 2015 | 2,600 | 2,450 |
| Lipoa Street, Between Kupalaiki Loop and Kauhale Nani Place | 2014 | 3,750 | 4,250 |
| Piikea Avenue, Between South Kihei Road and Liloa Drive | 2015 | 4,100 | 4,000 |
| Waipuilani Road, Between Hou Street and Kaikane Place | 2015 | 650 | 1,300 |
| Kulanihakoi Street, Between Oluea Street and South Kihei Road | 2015 | 1,100 | 1,100 |
| Ohukai Road, Between Piilani Highway and Kaiola Place | 2015 | 1,700 | 1,800 |

Source: HDOT

### 3.2.3.8 Volume to Capacity Ratio and Level of Service

Traffic operations and the performance of a roadway can be described in terms of level of service (LOS) and volume to capacity (V/C) ratio. The six LOS classifications, each given a letter designation from A to F, describe operating conditions on a roadway based on a variety of measures, such as delay, speed, and density. The classifications are defined by the Transportation Research Board's 2010 Highway Capacity Manual. LOS A generally represents ideal operating conditions with little to no delay, where movements are not influenced by other vehicles on the roadway. LOS F represents poor operating conditions, including high delays and extreme congestion.

#### Level of Service (LOS) Definitions

- LOS A: Free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream.
- LOS B: Reasonably unimpeded operations. Freedom to maneuver within the traffic stream is only slightly restricted.
- LOS C: Stable operations. Freedom to maneuver within the traffic stream is more restricted.
- LOS D: Freedom to maneuver within the traffic stream is noticeably limited. Drivers may experience reduced comfort.
- LOS E: Vehicles are closely spaced, leaving little room to maneuver within the traffic stream. Significant delays occur.
- LOS F: Breakdowns in traffic flow. Vehicles experience high delays and low speeds.

Source: Transportation Research Board, 2010

Traffic operations can also be described by V/C ratios, which quantify 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 generally correlates to LOS F conditions.

### 3.2.3.9 Roadway Operations and Congested Areas

Exhibit 3-17 depicts the estimated V/C ratios on the study area roadways during the p.m. peak hour. The majority of local roadways operate at LOS C, or at a V/C ratio of 0.80 or better, during the typical afternoon commute peak.

Piilani Highway, north of Alanui Ke Alii Drive, operates at a V/C ratio of 0.80 or worse and is generally congested during the afternoon in both directions of travel. Piilani Highway serves as both a regional connection between central and south Maui, and a local north-south access facility within Kihei.

Between Kulanihakoi Street and Waipuilani Road or between Lipoa Street and Welakahao Road for example, vehicles must use either Piilani Highway or South Kihei Road to reach their destinations because no other parallel or alternative north-south routes are available. When vehicles making short, local trips on the highway are combined with regional trips traveling through Kihei, the capacity on Piilani Highway is affected.

South Kihei Road, between Piikea Avenue and Welakahao Road, operates at LOS F or a V/C ratio of at least 1.0. Capacity on South Kihei Road is reduced when vehicles turn onto or off of the road at business access driveways. When these accesses are closely spaced, such as in the area between Piikea Avenue and Welakahao Road, vehicles may need to reduce their speed multiple times, which causes short delays, reduces the overall capacity, and increases congestion on South Kihei Road.

### 3.2.3.10 Intersection Operations

Intersections facilitate vehicle turning movements and provide access between different roadways. Roadway intersections also provide crossing opportunities for pedestrians and bicycles. Major intersections within the study area are primarily controlled by either a traffic signal or a series of stop signs in one or more directions of travel. The intersection of Piikea Avenue and Liloa Drive is controlled by a single-lane roundabout.

Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. Per the Kihei Traffic Master Plan (County of Maui, 1996) a number of stop-controlled intersections on Piilani Highway and on South Kihei Road were identified for potential improvements to address future growth and congestion. Improvements included improving the existing traffic signal timing and installing roundabouts or traffic signals at select stop-controlled intersections and limiting vehicle access to right-turns only at locations that allow full access today.


**FIGURE 3-17**
**PM Volume to Capacity Ratio 2015**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

Exhibit 3-18 summarizes the existing control type of major intersections within the study area, by location, as well as the identified potential operational improvement.

Exhibit 3-18. Plan Area Intersection Control

| Intersection Location | Existing Condition | Planned Improvement[1] |
|---|---|---|
| Piilani Highway at North Kihei Road | Signalized | n/a |
| Piilani Highway at Uwapo Road | Signalized | n/a |
| Piilani Highway at Ohukai Road | Signalized | n/a |
| Piilani Highway at Kaonoulu Street | Stop Controlled, Full Access | Signalized |
| Piilani Highway at Kulanihakoi Street | Stop Controlled, Full Access | Stop Controlled, Right-In/Right-Out |
| Piilani Highway at Waipuilani Road | Stop Controlled, Right-In/Right-Out | Signalized |
| Piilani Highway at Piikea Avenue | Signalized | n/a |
| Piilani Highway at Lipoa Street | Signalized | n/a |
| Piilani Highway at Welakahao Road | Stop Controlled, Full Access | Signalized |
| Piilani Highway at Kanani Road | Signalized | n/a |
| Piilani Highway at Alanui Ke Alii Drive | Signalized | n/a |
| Piilani Highway at Keonekai Road | Stop Controlled, Full Access | Stop Controlled, Right-In/Right-Out |
| Piilani Highway at Kilohana Drive | Signalized | n/a |
| South Kihei Road at North Kihei Road | Signalized | n/a |
| South Kihei Road at Uwapo Road | Stop Controlled, Full Access | Roundabout or Signalized |
| South Kihei Road at Ohukai Road | Stop Controlled, Full Access | Roundabout or Signalized |
| South Kihei Road at Kaonoulu Street | Stop Controlled, Full Access | Roundabout or Signalized |
| South Kihei Road at Kulanihakoi Street | Stop Controlled, Full Access | Roundabout or Signalized |
| South Kihei Road at Waipuilani Road | Stop Controlled, Full Access | n/a |
| South Kihei Road at Piikea Avenue | Signalized | n/a |
| South Kihei Road at Azeka Shopping Center | Signalized | n/a |
| South Kihei Road at Lipoa Street | Signalized | n/a |
| South Kihei Road at Welakahao Road | Signalized | n/a |
| South Kihei Road at Keala Place | Signalized | n/a |
| South Kihei Road at Kanani Road | Stop Controlled, Full Access | Roundabout or Signalized |
| South Kihei Road at Alanui Ke Alii Drive | Signalized | n/a |
| South Kihei Road at Keonekai Road | Stop Controlled, Full Access | Roundabout or Signalized |
| South Kihei Road at Kilohana Drive | Stop Controlled, Full Access | n/a |
| Lipoa Street at Liloa Drive | Signalized | n/a |
| Lipoa Street at Kihei Community Center | Signalized | n/a |
| Piikea Avenue at Liloa Drive | Roundabout | n/a |

[1] County of Maui, 1996

n/a = No planned improvement at this location was documented in the Kihei Traffic Master Plan (County of Maui, 1996).

Full Access = Vehicle turning movements are allowed to and from all directions of travel.

Right-In/Right-Out = To and from Piilani Highway, vehicles are allowed to make right-turns only to access cross streets. Left-turns to and from the highway are restricted.

### 3.2.3.11 Areas of Safety Concern

Crash data for state and county roadways and intersections within the study area were compiled by the Highway Safety Improvement Program. This data is provided under the protection of Title 23 United States Code 402(k) and 409, and is intended for highway safety and educational purposes only.

Historical crash data on Piilani Highway between North Kihei Road and Kilohana Drive was provided by the State of Hawaii Department of Transportation and summarized to identify locations with potential safety concerns. The most recent data available includes crashes reported from January 1, 2012, through December 31, 2014. Within this 3-year period, 141 total crashes were reported along the highway. The majority of crashes (110 crashes, or 78 percent of incidents) resulted in injuries to one or more people, while 26 crashes (approximately 18 percent of incidents) resulted in property damage only. Five crashes (approximately 4 percent of incidents) resulted in a fatality, described as follows:

- Vehicle-Pedestrian crash, 2013. The pedestrian-fatality incident occurred near the intersection of Piilani Highway and Waipuilani Road under cloudy, dry conditions. It involved one motor vehicle and one impaired pedestrian in the roadway illegally.
- Motorcycle crash, 2014. The incident occurred on Piilani Highway between North Kihei Road and Uwapo Road at night. It involved an individual on a motorcycle colliding with the guardrail.
- Vehicle-Pedestrian crash, 2014. The pedestrian-fatality incident occurred on Piilani Highway between North Kihei Road and Uwapo Road at night and involved a motor vehicle and a pedestrian who was in the roadway.
- Vehicle crash, 2014. The incident occurred between Lipoa Street and Welakahao Road and involved an impaired driver (recorded as drug or alcohol-related) rolling their vehicle over off the highway.
- Vehicle-Bicycle crash, 2014. The bicycle-fatality incident occurred just south of Welakahao Road and involved an impaired driver (recorded as drug or alcohol-related) running a bicyclist off the road.

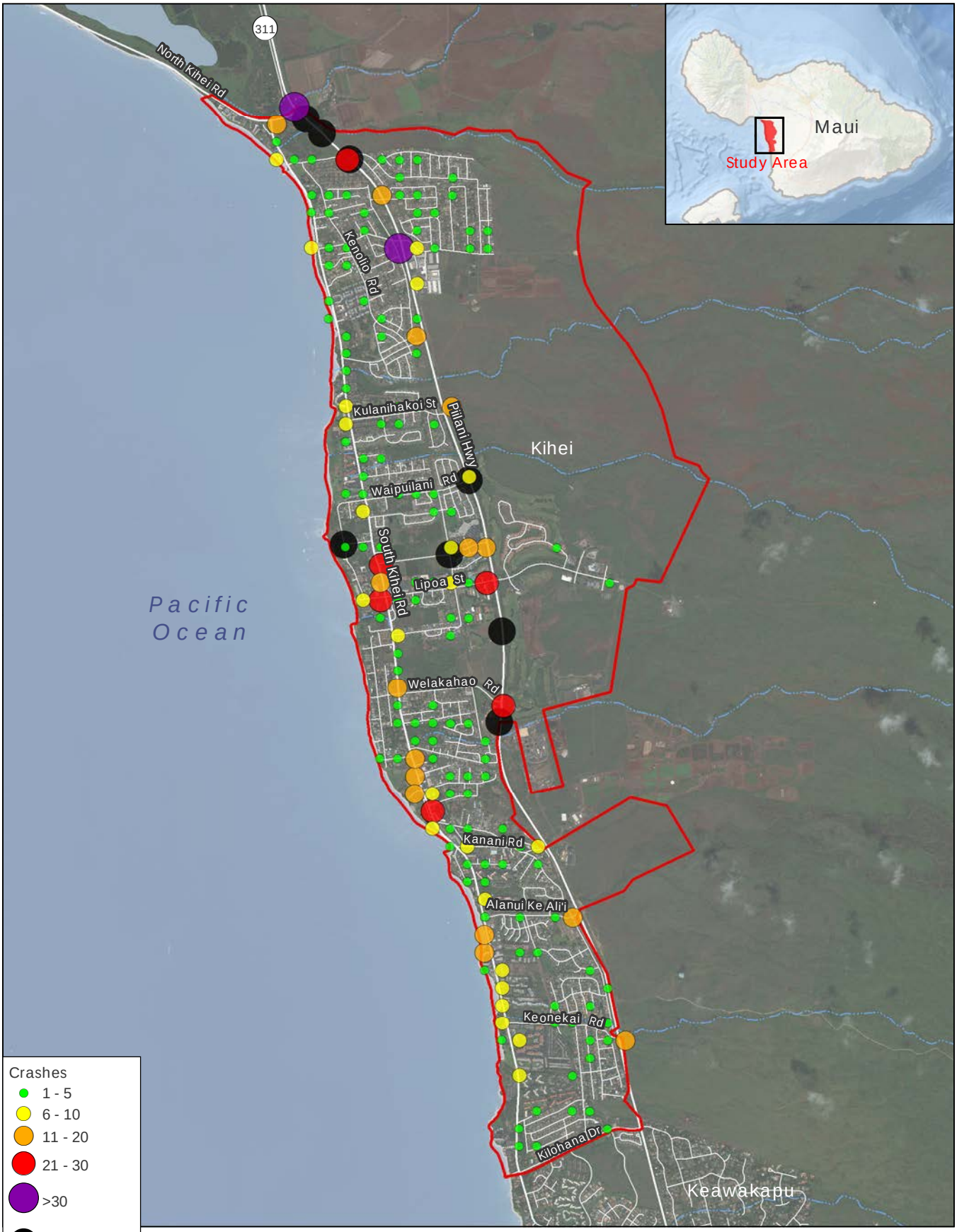
The most common types of non-fatal crashes on Piilani Highway involved one motor vehicle rear-ending another vehicle (33 percent of all incidents) or one motor vehicle broadsiding another (approximately 16 percent of incidents) at an intersection.

Crash data on local county roadways was provided by the Maui Police Department for the time period between January 1, 2012, through December 31, 2017. Within this 7-year period, over 600 total crashes involving an injury or major property damage were reported. Three crashes on local county roadways resulted in a fatality, as follows:

- Vehicle-Pedestrian crash, 2014. The pedestrian-fatality incident occurred near the intersection of Piikea Avenue and Liloa Drive. A motor vehicle travelling eastbound on Piikea Avenue collided with a pedestrian in the roadway.
- Vehicle-Pedestrian crash, 2015. The incident occurred on Ulunui Road near the Veterans of Foreign Wars (VFW) Hall. It involved one motor vehicle colliding with a pedestrian as it was reversing.
- Vehicle-Pedestrian crash, 2016. The pedestrian-fatality incident occurred on Piilani Highway at Uwapo Road. A motor vehicle making a left turn from Kaiwahine Street to southbound Piilani Highway collided with a pedestrian heading eastbound across the highway. The pedestrian was in the marked crosswalk.

Exhibit 3-19 shows the geographical distribution of clusters of crashes within the study area. In general, crashed mainly occurred at or near intersections on Piilani Highway or on South Kihei road. The intersection of Piilani Highway and Ohukai Road experienced the highest number of crashes (40 total crashes) within the time period, while Piilani Highway at North Kihei Road experienced 32 crashes.

Crashes involving pedestrians or bicycles are shown on Exhibit 3-20. Locations where higher concentrations of crashes between motorized vehicles and non-motorized modes occur are on South Kihei Road near Piikea Avenue and on South Kihei Road near Keala Place and Alahele Place. Both areas are hubs for residents and visitors, with multiple shops, dining, and recreation that are easily accessible by walking or biking from nearby rentals or hotels.




*Data Source: HDOT/MVA*

**FIGURE 13-9**
**2012-2017 Vehicle Crash Locations**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

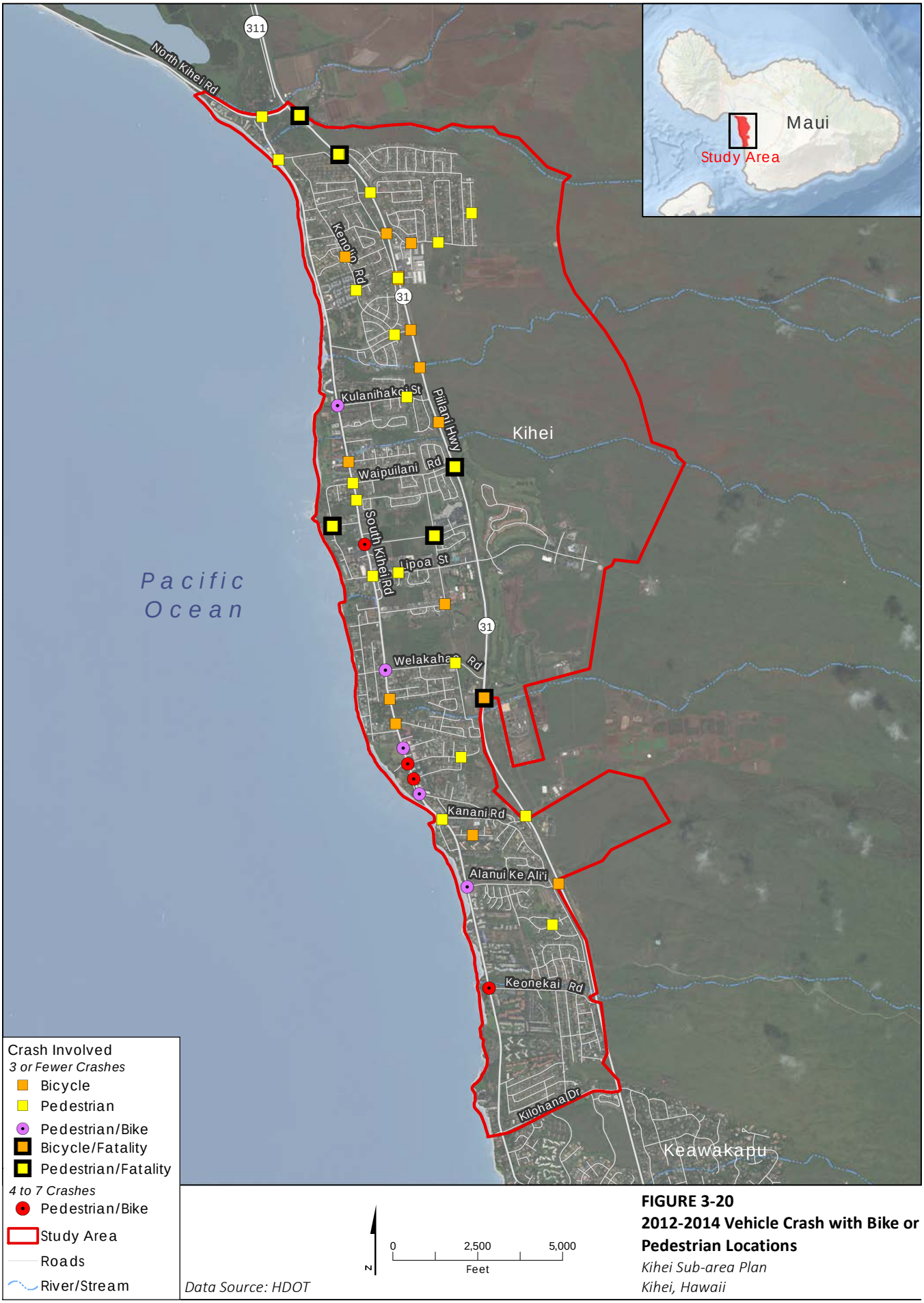



**FIGURE 3-20**
**2012-2014 Vehicle Crash with Bike or Pedestrian Locations**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

## 3.2.4 Drainage Areas, Gulches, and Wetlands

The topography of the Kihei study area varies from heavily developed flat coastal areas to steeper slopes *mauka* of Piilani Highway that form the foothills on the leeward side of Haleakala. Because of its leeward location, Kihei is relatively dry, with a mean annual rainfall of approximately 10 inches. During periods of heavy rain, however, significant volumes of storm water can flow from upper watershed areas, draining through well-defined gulches to ocean outlets along the Kihei coast. In March 2017, heavy rains and thunderstorms sent floodwaters over South Kihei Road between Kaonoulu Road and Kulanikahai Street. South Kihei Road was closed, severely limiting travel in the area (The Maui News, 2017).

The November 2016 *Kihei Drainage Master Plan* identified eight drainage districts. Each district is described below, starting from the north and moving south. The Drainage Master Plan identified natural drainage features and assessed the ability of existing drainage infrastructure to convey expected flows. This section focuses on flooding issues that potentially impact Kihei roadways. Exhibit 3-21 shows the major gulches and roadway crossings.

### 3.2.4.1 Waiakoa District

A major drainage feature in this district is Waiakoa Gulch. Piilani Highway crosses Waiakoa Gulch at the Waiakoa Uka Bridge (northbound) and Waiakoa Bridge (southbound). *Makai* of Piilani Highway, water flows overland through a flat and shallow earth channel toward South Kihei Road. Of the two highway bridges, Waiakoa Bridge is the physical constraint with capacity to barely pass the 100-year flow.

The ground cover between Piilani Highway and South Kihei Road consists of dense vegetation of kiawe trees and brush. Sand deposits and debris accumulate along the gulch. There are two culverts at the South Kihei Road crossing that do not have sufficient capacities to handle large flows. The channel outlet *makai* of South Kihei Road is normally blocked by sand dunes, contributing to roadway flooding.

At the southern end of Waiakoa District, storm runoff crosses Piilani Highway through arch pipes and a culvert north of Ohukai Road. Ohukai Road functions as a flood channel carrying the majority of flows toward the ocean. Sand dunes and vegetation *makai* of South Kihei Road are higher than the road such that flow will pond along South Kihei Road until it overtops and breaks the sand dunes, causing flooding problems around the Ohukai Road intersection during heavy rainfall.

### 3.2.4.2 Kulanihakoi District

Kulanihakoi Gulch is the major drainageway in the district and has the largest drainage area in the Kihei area. Storm runoff crosses Piilani Highway through Kulanihakoi Bridge and continues to a natural earth channel between Piilani Highway and Kenolio Road, then enters a channel with boulder-lined side slopes. Sand dunes accumulating at the gulch mouth contribute to flooding problems. During heavy rainfall, the runoff will overtop South Kihei Road. Flooding has been observed along a segment of South Kihei Road from Kaonoulu Street (Kulanihakoi District) to Hoonani Street (Waipuilani District). The intersection of South Kihei Road and Kulanihakoi Street is a low spot where surface runoff accumulates before flowing through the ocean outlet.

### 3.2.4.3 Waipuilani District

Waipuilani Gulch is another major drainageway in the district. Piilani Highway crosses the gulch at Waipuilani Bridge. Continuing *makai*, runoff passes through a natural earth channel, and the terrain flattens out as the gulch approaches South Kihei Road. Insufficient culvert capacity and sand berms located at the mouth aggravate flooding problems. Backwater effects have been observed at a dirt road (future Kenolio Road extension) between Piilani Highway and South Kihei Road.

### 3.2.4.4 Keokea District

Storm runoff flows cross Piilani Highway through a series of culverts and Keokea Bridge over Keokea Gulch. Some of the overflow is discharged to wetlands located *mauka* of South Kihei Road on both sides of Piikea Avenue and Halekuai Street. These wetlands, both natural and manmade, serve as detention basins.

Flooding during heavy rainfall has been observed on South Kihei Road at the intersection with East Waipuilani Road (a low spot), between West Waipuilani Road and West Lipoa Street (a stretch that is almost level), and *mauka* of the Keokea Gulch Outlet (a regulation reservoir located south of Saint Theresa's Church).

On the *makai* side of South Kihei Road, the area bounded by South Kihei Road, West Lipoa Street, Uluniu Road, and West Waipuilani Road lacks a drainage system and is subject to shallow flooding from ponding.

### 3.2.4.5 Charlie Young District

Major drainage features in this district include Waimahaihai Gulch, Kihei Gulch, and Kaluaihakoko Stream. According to the Drainage Master Plan, the Kihei Channel fades out and runoff sheets flow to South Kihei Road, which can result in flooding. Also reported were storm water flows crossing Auhana Road and runoff overtopping the intersection of Kanoe Street and Kanani Road.

### 3.2.4.6 Kamaole District

Kamaole Gulch is the major drainage way in the district. The well-defined gulch crosses Piilani Highway through two 96-inch culverts. During past storm events, floodwater from Kamaole Gulch has overtopped South Kihei Road and damaged nearby Kamaole Beach Park.

Further south, storm runoff passes Piilani Highway through two 78-inch culverts. As part of the drainage system, the North-South Collector Extension (Walua Place to Keonekai Road) was designed to form a sag curve (or concrete ford) to allow large runoff to overflow at the crossing. Bollards placed at the ford instruct motorists to avoid crossing when water reaches the hazard level indicated on the bollard.


*Ford crossing on Liloa Hema Drive just north of Keonekai Road.*

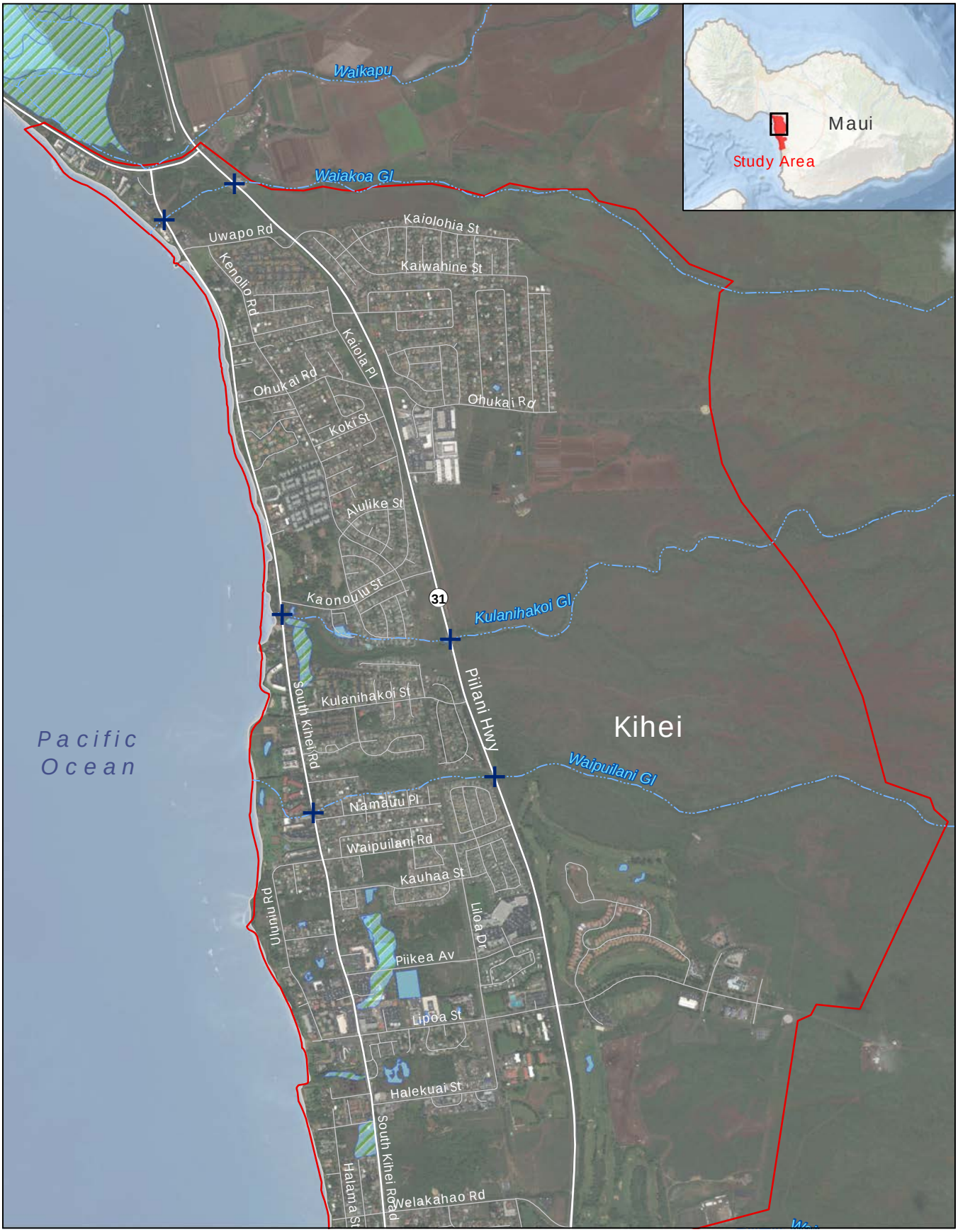
### 3.2.4.7 Liholiho District

Liholiho Gulch is the major drainage way in the district. The Liholiho Gulch floodplain is contained with a natural channel except at South Kihei Road, where insufficient capacity can cause flow to overtop the road. The drainage infrastructure in this district also includes a ford crossing on Kanakanui Road.

Further south, where the terrain is steeper, no flooding problems have been observed on South Kihei Road, although surface runoff sheet flows across the roadway.

### 3.2.4.8 Kilohana Drive District

The Kilohana District includes drainage flows on the northern and southern sides of Kilohana Drive. No observed flooding has been reported at the South Kihei Road crossing.




LEGEND

- Roadway Crossing
- Streams
- Roads
- Study Area
- Wetlands (NWI)
- Waterbody

N

0 1,500 3,000

Feet

**FIGURE 3-21**

**Wetlands and Waterways - North**

*Kihei Sub-area Plan*

*Kihei, Hawaii*

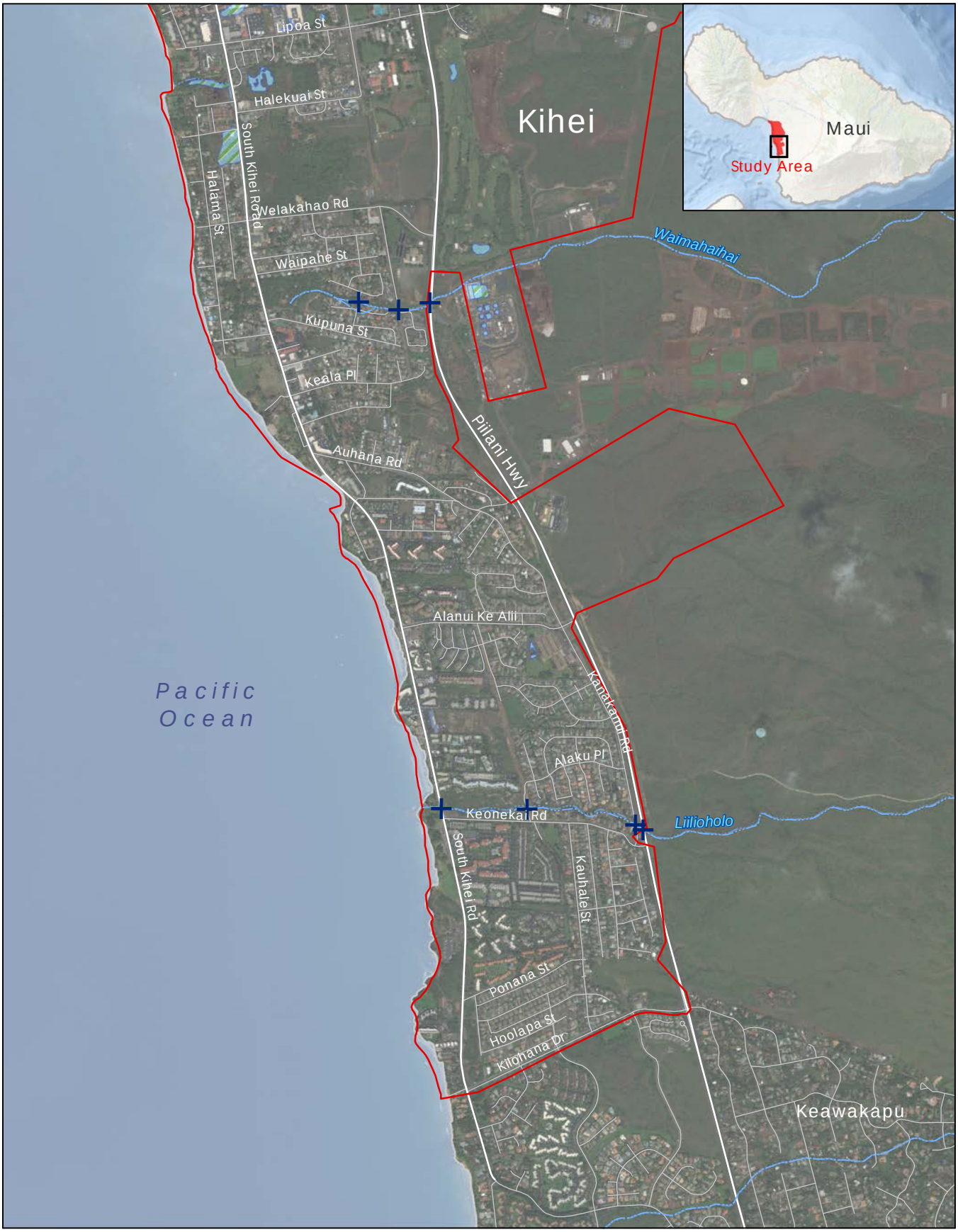



**FIGURE 3-21**
**Wetlands and Waterways - South**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

## 3.2.5 Coastal Hazards

As a coastal community, Kihei is subject to risks associated with extreme weather and ocean conditions. Seasonal high waves push sand onto South Kihei Road (for example, in the stretch near Ohukai Road), which accumulates in the shoulder and interferes with roadway use by pedestrians and bicyclists. Tsunami evacuation signs are also readily evident on South Kihei Road. Roadways are essential for egress and access during emergencies and for disaster relief and recovery. Understanding potential vulnerabilities to infrastructure will help to plan resiliency of lifeline transportation routes.

Exhibit 3-22 shows the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA). Large areas of land on the *makai* side of South Kihei Road and the roadway itself are classified as Zone VE, which is a coastal high hazard area (that is, has a 1 percent or greater chance of experiencing an annual flooding event associated with storm waves three feet in height or greater).[1] The base elevation of flooding ranges from 11 to 12 feet above mean sea level. The impact of the coastal flood hazard area on South Kihei Road is pronounced in the northern portion of the study area to about Ohukai Road. Southward to approximately Kanani Road, South Kihei Road is impacted by floodways (Zones AE and AH). Ground elevation rises in the southern portion of the study area, south of Kanani Road, where South Kihei Road is less susceptible to flooding.

Flooding refers to a condition where dry areas become wet temporarily, either periodically or episodically. A related, but separate phenomenon, is coastal inundation, which is a process where a dry area becomes permanently drowned or submerged. The factors contributing to inundation are sea-level rise, extreme tides, waves, storm surge, groundwater inundation, and poor drainage. Exhibit 3-23 shows areas that have the potential to be inundated as sea-level rises based on projections and modeling by the University of Hawaii School of Ocean and Earth Science and Technology. When sea level rises by 3 feet, inundation is projected to occur along the shoreline and at drainage outlets to the ocean, notably at the County's registered reservoir near Saint Theresa's Church. If sea level rises by 4 feet or more, South Kihei Road is expected to experience inundation impacts between approximately Kaonoulu Street and Auhana Road.

[1] FEMA FIRM for Kihei include Maps 1500030559F, 1500030567F, 1500030580F, 1500030586G, 1500030588G, and 1500030676F. Maps in the F series were revised September 19, 2012. Maps in the G series were revised November 4, 2015.

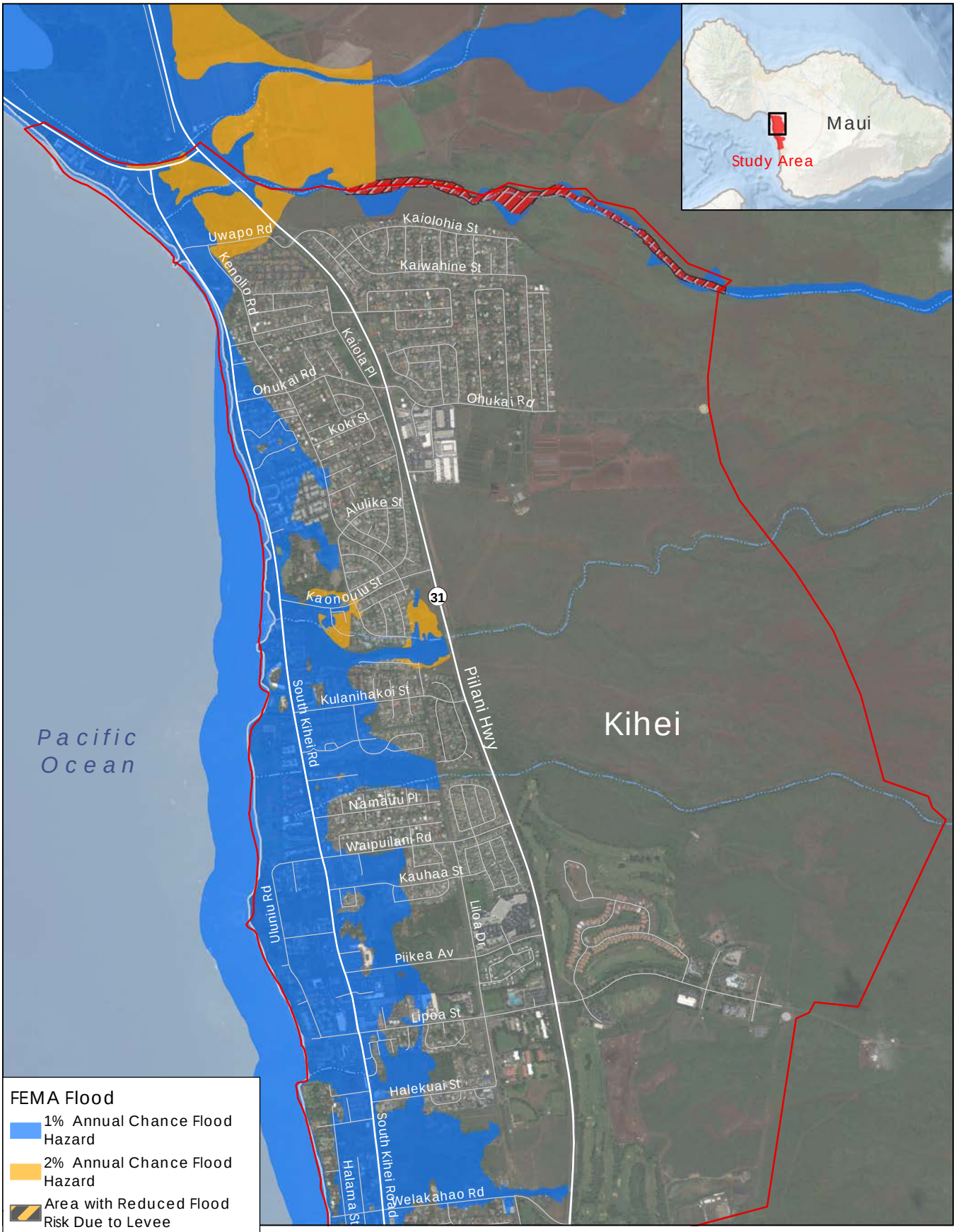



**FIGURE 3-22**
**FEMA Flood Zones - North**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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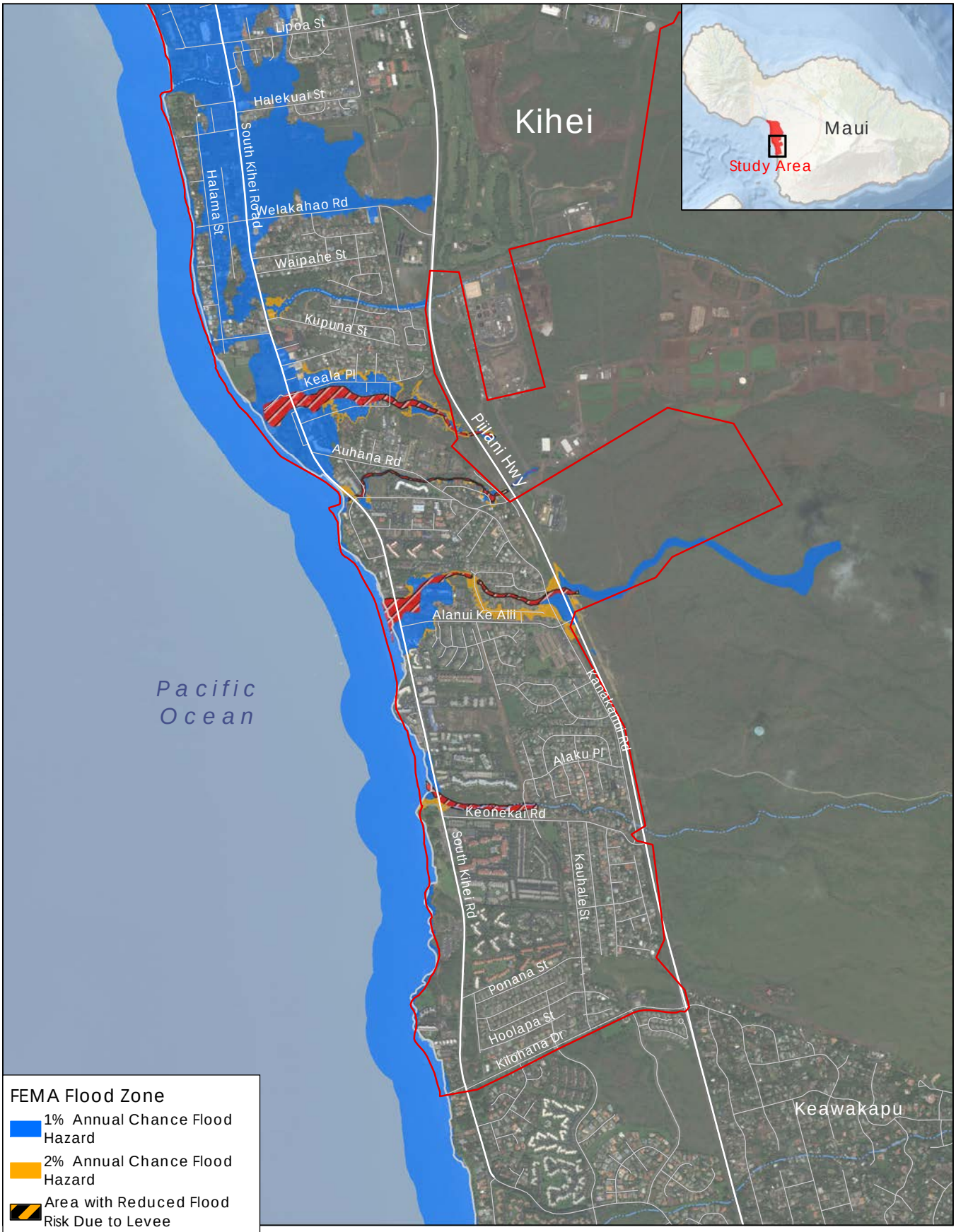


**FIGURE 3-22**
**FEMA Flod Zones - South**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

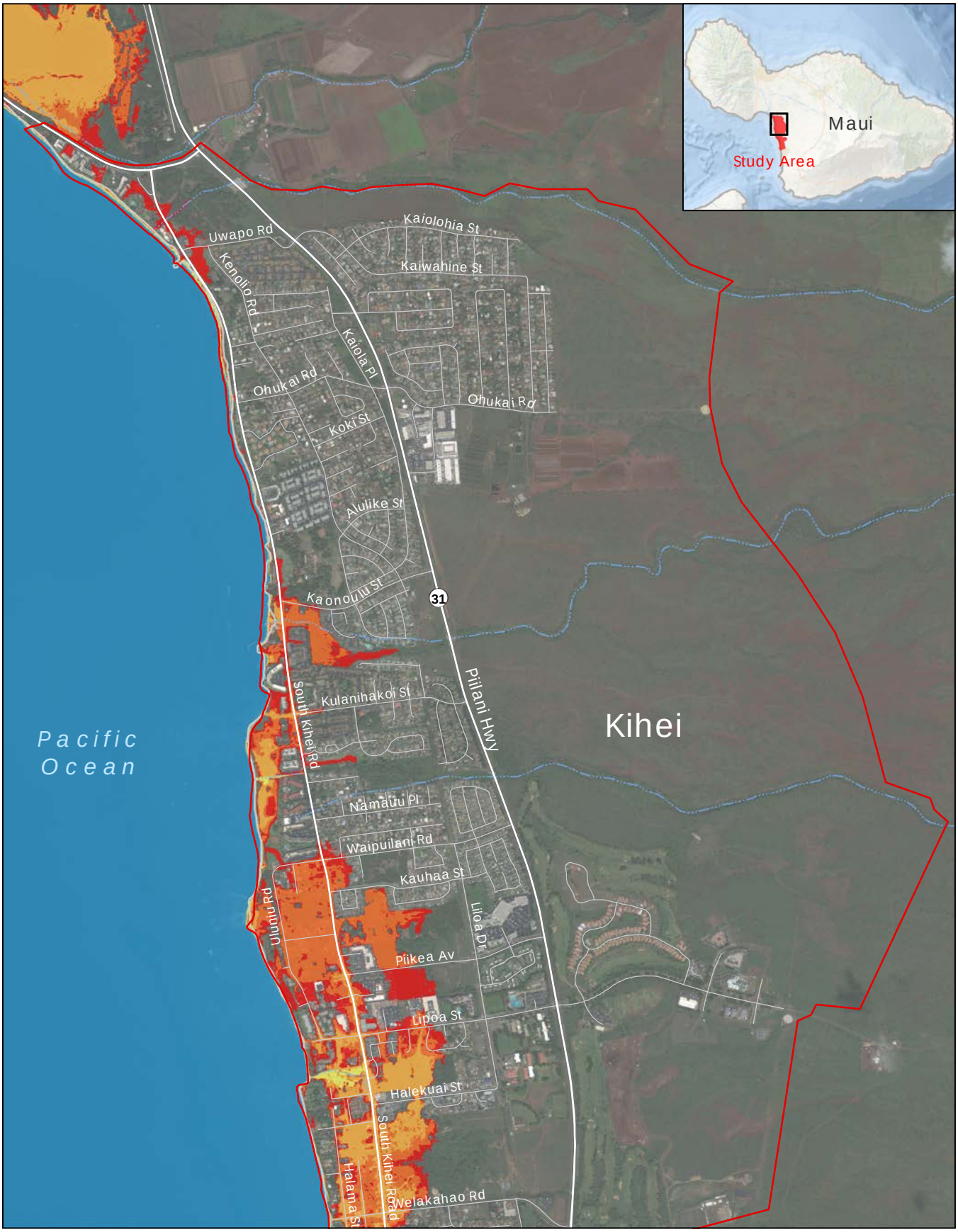


**FIGURE 3-23**
**Sea Level Rise Inundation - North**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

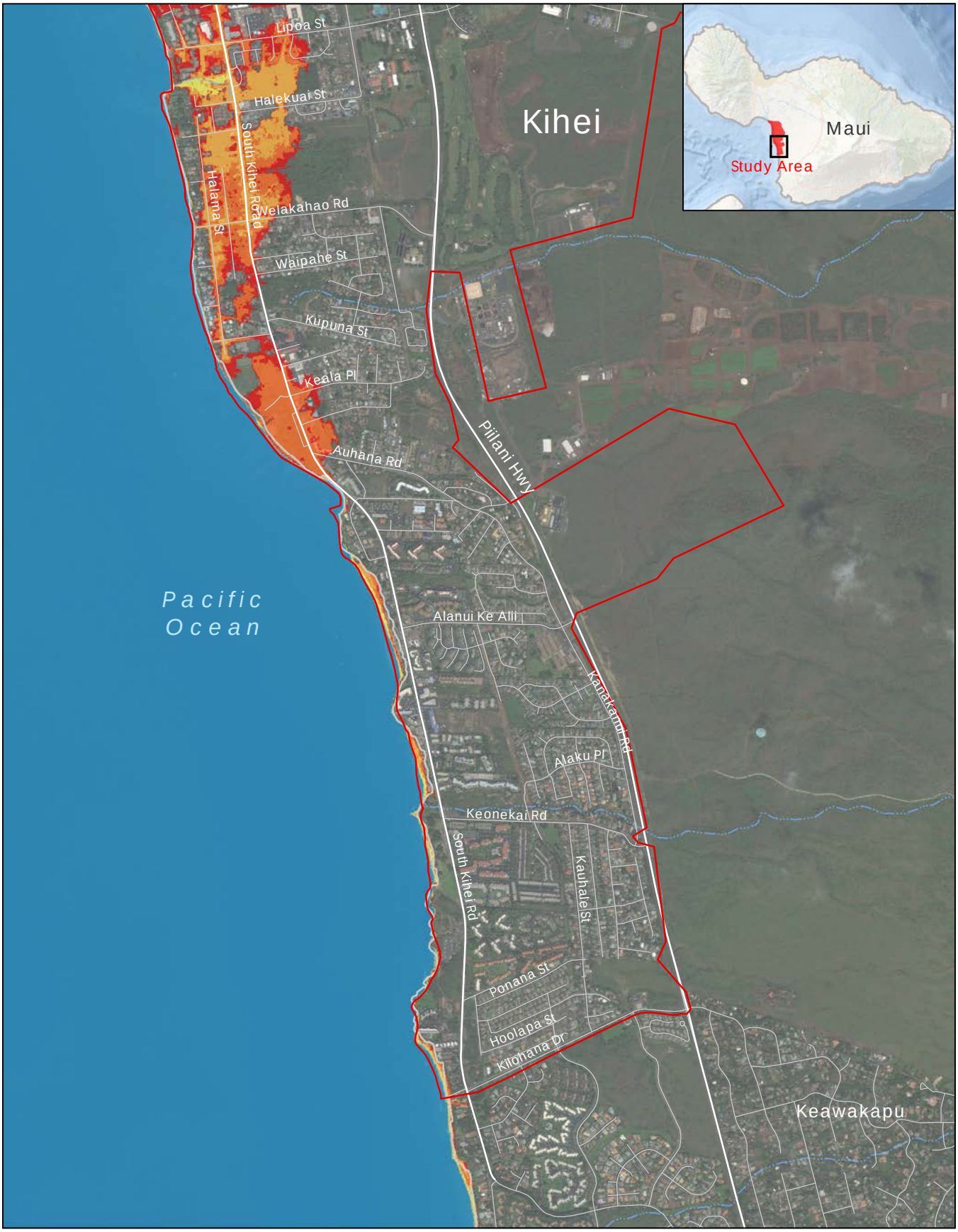


**FIGURE 3-23**
**Sea Level Rise Inundation - South**
*Kihei Sub-area Plan*
*Kihei, Hawaii*

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### 3.2.6 Historic and Archaeological Sites

There is a cluster of historic sites in the northern portion of the study area. Koieie Fishpond, also known as Kalepolepo Fishpond, is an ancient Hawaiian fishpond estimated to have been built between 1,400 and 1,500 AD. The fishpond, located near the Humpback Whale National Marine Sanctuary offices and visitor facility on South Kihei Road, is listed in the National Register of Historic Places. There is an ongoing effort to restore the fishpond.

In the mid-1800s, the area of Kalepolepo contained a bustling community of whalers who traded for potatoes brought down from the slopes of Haleakala. Kihei Wharf was the heart of Old Kihei Town, in the vicinity of South Kihei Road and Uwapo Road. What remains of the wharf today is a rocky pier-like structure with interpretive signage.

There was also a small religious community at Kalepolepo that was led by David Malo, a scholar who became one of the first Christian ministers. Malo moved to Kalepolepo from Lahainaluna in 1843 and began preaching under the trees at Kalepolepo, calling the congregation together using a conch shell. He organized the construction of Kilolani Church, located along Waipuilani Gulch just inland from Kalepolepo Fishpond. The ruins of the stone church are now part of the grounds of the Trinity Episcopal Church by-the-Sea. A small cemetery is also located on the south side of the church (Pepalis and Kolb, 2002). The church is listed in the National Register of Historic Places.

Further south along the coastline are the remnants of the 14th century Koai Kamaole fishing shrine, located near the Kihei Public Library and Kihei Fire Station.

Potential solutions address recognized needs in Kihei's transportation system and propose actions that will meet Plan goals, objectives, and desired outcomes.

# Potential Solutions and Evaluation

Chapter 4

The potential solutions were identified through a technical analysis of existing conditions and from input and validation from the project team, TAC, CAC, and the general public. This chapter begins by describing the methodology for identifying the location of the potential solutions. The potential solutions described in this chapter form the basis for recommendations in Chapter 5.

## 4.1 Methodology

The development process used to identify the potential solutions was based on specific technical factors. The project team worked closely with the TAC and CAC to ensure that the potential solutions identified met the goals and objectives of the Plan and represented community concerns.

To identify the potential solutions, evaluation criteria were defined at the beginning of potential solution development process.

Stakeholders and the project team identified potential solutions to address the recognized needs and issues in Kihei. The potential solutions are based on technical knowledge of best practices and previous plans and studies, and reflect the information gathered as part of the inventory of existing conditions. The project team then evaluated the potential solutions against the Plan evaluation criteria and worked with stakeholders to prioritize the potential solutions.

## 4.2 Solution Development

The project team drew upon a number of sources to develop the list of potential solutions.

- Previous plans and studies recommended potential solutions to addressed identified deficiencies.
- Stakeholders validated pre-identified potential solutions and identified additional ones.
- Data collected on crash locations and traffic counts were used to identify safety concerns and locations of congestion.
- Traffic simulations and models identified the location of capacity and congestion issues.

As part of this effort, the project team reviewed relevant previous plans and studies and compiled a list of potential solutions that had been identified. The following previous studies were examined:

- Kihei-Makena
  - ✓ *Kihei-Makena Community Plan* (County of Maui, 1998)
  - ✓ *Pre-Final Kihei Drainage Master Plan, Waiakoa Gulch to Kilohana Drive* (County of Maui, 2016b)

- ✓ *Kihei/Makena District Roadway and Drainage Concerns* (Kihei Community Association, 2017)
- ✓ *Kihei Community Association Position Statement Addressing Road and Transportation Standards* (Kihei Community Association, 2014 [revised August 2018])
- ✓ *Kihei Traffic Master Plan* (County of Maui, 1989)
- ✓ *Kihei Traffic Master Plan* (County of Maui, 1996)

- Maui Island and Maui County
  - ✓ *South Maui Region Parks and Open Space Master Plan* (County of Maui, 2003)
  - ✓ *County of Maui Traffic Impact Fee Study, Draft Technical Report 1—Background Information and Data Gathering* (Wilbur Smith Associates and Belt Collins, 2010)
  - ✓ *Hazard Mitigation Plan Update* (County of Maui, 2015)
  - ✓ *Maui Short Range Transit Plan* (County of Maui, 2016a)
  - ✓ Maui Transportation Improvement Program (TIP) FY2019-2022 (Maui MPO, 2018)
  - ✓ *Federal-Aid Highways 2035 Transportation Plan for The District of Maui* (HDOT, 2014)
  - ✓ *Maui Island General Plan 2030* (County of Maui, 2012b)
- State of Hawaii
  - ✓ Statewide Transportation Improvement Program (TIP) FY 2015-2018 (Approved by HDOT October 27, 2014)
  - ✓ *Climate Change Impacts in Hawai'i* (University of Hawaii Sea Grant College Program, 2014)
  - ✓ *Statewide Pedestrian Master Plan* (HDOT, 2013)
  - ✓ *Bike Plan Hawaii* (HDOT, 2003)

In addition, numerous environmental assessments and environmental impact statements were reviewed and analyzed for potential solutions. Documents reviewed included the following:

- *Final Environmental Assessment, Wailea Ike Drive and Wailea Alanui Drive Intersection Improvements* (Munekiyo & Hiraga, Inc., 2010)
- *Final Environmental Assessment, Pi'ilani Highway Widening Project (Kilohana Drive to Wailea Ike Drive)* (Volumes I and II) (Munekiyo & Hiraga, Inc., 2012)
- *Final Environmental Assessment, Proposed Downtown Kihei Project* (Volumes I and II) (Munekiyo & Hiraga, Inc., 2013)
- *Environmental Impact Statement Preparation Notice for Piilani Promenade* (Chris Hart & Partners, Inc., 2013)


Because many of the studies had been conducted many years ago, it was important to re-evaluate their recommendations and to also look at them holistically. The project team reviewed the previously identified potential solutions with the TAC and CAC and learned from them—the background, concerns, and benefits, and whether the potential solutions were still valid. The TAC and CAC also provided additional input and helped to identify new potential solutions.

Based on the background and understanding the transportation issues and needs unique to Kihei, the project team refined the potential solutions. In addition, based on the existing traffic patterns, crash data, vehicular volumes, and intersection operations, the project team developed additional potential solutions to provide additional capacity and improve congestion and safety.

## 4.3 Pass/Fail Assessment

It was necessary to cull the preliminary list of potential solutions to focus on solutions likely to be pursued because they are consistent with the Project goals and Maui Island vision. The pass/fail assessment provided the first level of screening.

The project team performed the pass/fail assessment once solutions were developed. If a solution failed **any** of the assessment criteria, it was not advanced forward to the prioritization process. The results were shared with the TAC and CAC for validation. **Exhibit 4-1** shows the pass/fail criteria used in the assessment.

## 4.4 Cost Estimates

Costing was a key component of the solution evaluation process. The project team developed a basic cost estimating template and tool to ensure consistency across the costing of all potential solutions. The resultant cost estimates are consistent with Class 5 of the Association for the Advancement of Cost Engineering (AACE) International Classification System. **Exhibit 4-2** shows the primary and secondary characteristics of each of the five classes of the AACE International Classification System. Class 5 estimates are routinely used for concept screening, as they require far lower ranges of project definition and preparation efforts than other classes and therefore have the largest variability in accuracy.

Costs for each potential solution were estimated across four major cost categories:

- Project development (such as environmental documentation, traffic studies, and design)
- Right-of-way
- Construction
- Construction management

Each of these categories contained multiple subcategories of costs, a majority of which were priced based on unit costs. For example, square feet of new sidewalk or lane miles of new roadway or greenway were estimated where applicable to the particular solution and multiplied by industry standard costs. Adjustments for Maui-specific pricing were made when information was available.

Exhibit 4-1. Pass/Fail Assessment Evaluation Criteria

| Criteria | Pass/Fail |
|---|---|
| **Maui Island Vision**: Is the solution in alignment with the Maui Island Vision?<br>Maui Island will be environmentally, economically, and culturally sustainable with clean, safe, and livable communities and small towns that will protect and perpetuate a *pono* lifestyle for the future. | |
| **Plan Goals**: Does the solution support one or more of the plan goals of the Kihei Sub-area Transportation Plan? | |
| **Jurisdiction:** Is the solution within the physical and/or operational jurisdiction of the County of Maui or the State Department of Transportation? | |
| **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? | |

Exhibit 4-2. AACE International Classification System

| Estimate Class | Primary Characteristic | Secondary Characteristic | | | |
|---|---|---|---|---|---|
| | ***Level of Project Definition*** ***Expressed as % of complete definition*** | ***End Usage*** ***Typical purpose of estimate*** | ***Methodology*** ***Typical estimating method*** | ***Expected Accuracy Range*** ***Typical variation in low and high ranges[a]*** | ***Preparation Effort*** ***Typical degree of effort relative to least cost index of 1[b]*** |
| Class 5 | 0% to 2% | Concept Screening | Capacity Factored, Parametric Models, Judgment or Analogy | L: -20% to -50%<br>H: +30% to +100% | 1 |
| Class 4 | 1% to 15% | Study or Feasibility | Equipment Factored or Parametric Models | L: -15% to -30%<br>H: +20% to +50% | 2 to 4 |
| Class 3 | 10% to 40% | Budget, Authorization, or Control | Semi-Detailed Unit Costs with Assembly Level Line Items | L: -10% 10-20%<br>H: +10% to +30% | 3 to 10 |
| Class 2 | 30% to 70% | Control or Bid/ Tender | Detailed Unit Cost with Forced Detailed Take-Off | L: -5% to -15%<br>H: +5% to +20% | 4 to 20 |
| Class 1 | 50% to 100% | Check Estimate or Bid/Tender | Detailed Unit Cost with Detailed Take-Off | L: -3% to -10%<br>H: +3% to +15% | 5 to 100 |

Notes:

[a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence} for given scope.

[b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of a project and the quality of estimating data and tools.

# 4.5 Evaluation Criteria

The purpose of the evaluation process is to assess the potential solutions by measuring how well they address the Plan's goals and objectives and the different stakeholder values. The evaluation criteria are tied to the Plan's goals and objectives and weighted according to their importance related to the Plan purpose, in coordination with the TAC and CAC. The evaluation criteria were developed before identifying the potential solutions to ensure that they are not biased or tailored toward a specific solution.

Evaluation criteria are measurable and are used to evaluate potential solutions by measuring how well they address the goals and objectives. For the Kihei Sub-area Transportation Plan, the Project team used evaluation criteria to assess the ability of projects to best meet the goals and objectives. In coordination with input from the TAC and CAC, the evaluation criteria were assigned weights indicating importance related to the Plan purpose. The results of the evaluation were shared with the TAC and CAC for review and comment. The

## Setting Evaluation Criteria

The evaluation criteria were established across the following 14 different categories:

- Safety
- Complete Streets
- System Preservation and Resiliency
- Regional Capacity and Mobility
- Local Capacity and Congestion
- Transit
- Economic Vitality
- Cost
- Right-of-way
- Land Use
- Natural Environment
- Cultural Resources
- Accessibility
- Equity

application of evaluation criteria to the projects is a tool to assist with decision-making for project prioritization and programming. Chapter 4 discusses the Kihei Sub-area Transportation Plan evaluation process in greater detail.

Exhibit 4-3 shows when in the Plan process the evaluation criteria were established (early in the process), as well as when they were applied to the solutions (later in the process). Early establishment of evaluation criteria helps ensure consistency with Plan goals and objectives, and independence from potential project biases.

Exhibit 4-4 shows the evaluation criteria and scoring framework for the Kihei Sub-area Transportation Plan.

Exhibit 4-3. Evaluation Criteria Development and Application

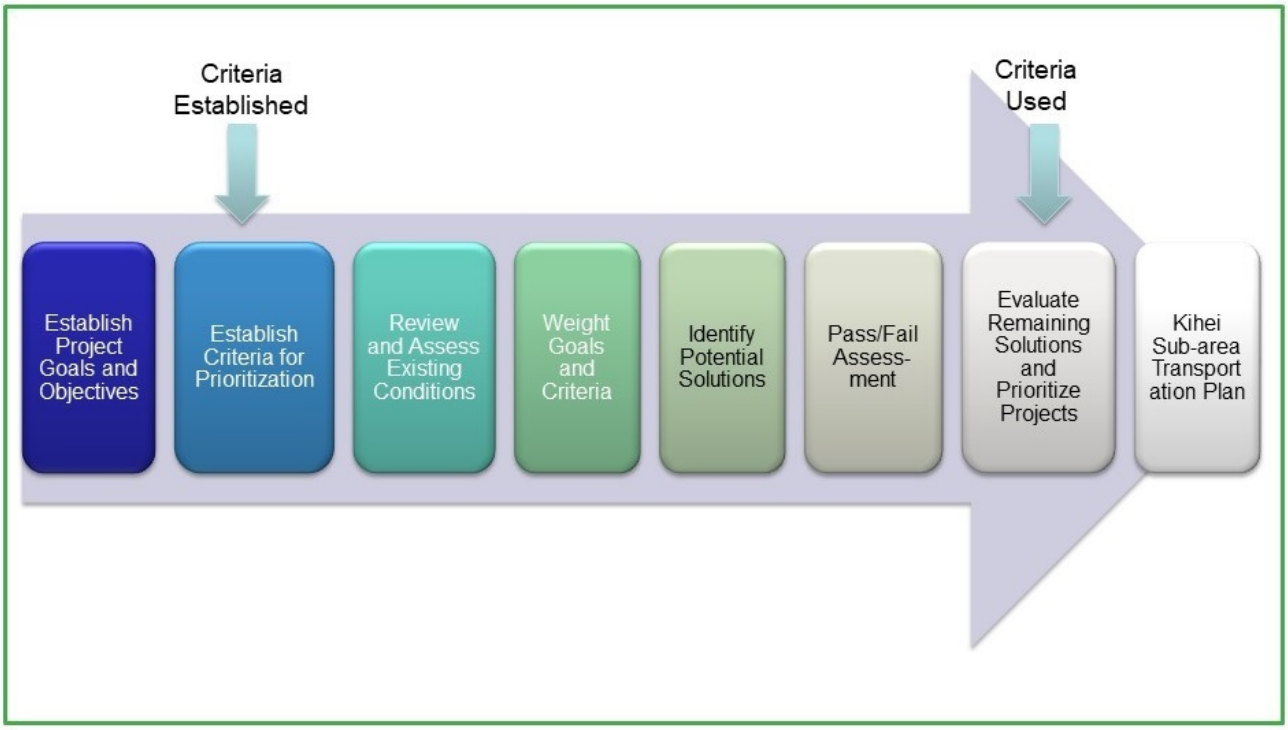



Exhibit 4-4. Kihei Sub-Area Transportation Plan Evaluation Criteria

| Goals | Evaluation Criteria Category and Description | Evaluation Criteria Scoring |
|---|---|---|
| 1. ***Safety***<br>Maintain a safe transportation system for users of all modes of travel and improve safety of the community | **Does the solution:**<br>▪ Manage access to and from major roadways (specify functional category) through signalized intersections, turn lanes, or restricted movements?<br>▪ Reduce or minimize the potential for conflicts between vehicles and non-motorized modes?<br>▪ Remove or relocate fixed objects, steep grades, or ditches from critical locations alongside roadways?<br>▪ Address concerns at a hot spot location?<br>▪ Include educational and enforcement strategies?<br>▪ Provide an alternate route during an emergency? | 1: Does not meet any of the criteria<br>2: --<br>3: Meets at least two criteria<br>4: --<br>5: Meets five or more criteria |

Exhibit 4-4. Kihei Sub-Area Transportation Plan Evaluation Criteria

| Goals | Evaluation Criteria Category and Description | Evaluation Criteria Scoring |
|---|---|---|
| | **Evaluation Method:** Review existing conditions and/or prepare conceptual project exhibit. | |
| **2.** ***Complete Streets*** Create a balanced, multimodal Complete Streets transportation network that provides options and access for motorized and non-motorized modes of travel | **Does the solution** support the following Maui County and HDOT Complete Streets policies?<br>▪ Accessibility and mobility for all – Transportation facilities planned and designed for ease of use and access to destinations by appropriate path of travel for all users, that enhance the ability to move people and goods<br>▪ Use and comfort for all – A system in which users of all abilities (whether bicyclists, pedestrians, transit riders, or drivers) feel safe<br>▪ Balanced solution, equitable in accommodating all modes of travel<br>**Evaluation Method:** Identify changes in travel choices or options afforded to users along a particular route or location. | -3: Inhibits the development of other modes of transportation<br>1: Limited to single mode of travel<br>2: --<br>3: No impact to the multimodal transportation system<br>4: --<br>5: Supports two or more modes of travel, or accommodates additional mode(s) within an existing travel corridor |
| **3.** ***System Preservation and Resiliency*** Maintain an efficient, complete, resilient transportation system for the long term | **Does the solution:**<br>▪ Include system preservation work and strategies to extend the life of the facility?<br>▪ Meet current storm drainage design standards?<br>▪ Consider the effects of sea level rise and extreme weather changes?<br>**Evaluation Method:** Review existing conditions and/or prepare conceptual project exhibit. | 1: Does not meet any of the criteria<br>2: --<br>3: Meets at least one criterion<br>4: --<br>5: Meets multiple criteria |
| **4.** **Regional Capacity and Mobility** Improve regional vehicular capacity and reduce congestion on roadways entering and exiting Kihei | **Does the solution:**<br>▪ Improve capacity and increase throughput (number of users) by reducing delay and travel times?<br>**Evaluation Method:** Review results of the travel demand model or operations/simulation model. | -5: Significantly decreases traffic efficiency through or within the study area by worsening vehicle delay by 10% or more<br>-3: Decreases traffic efficiency through or within the study area by worsening vehicle delay by 1 to 9%<br>1: No impact to traffic efficiency<br>3: Increases traffic efficiency through or within the study area by improving vehicle delay 1 to 9%<br>5: Significantly increases traffic efficiency through or within the study area by improving vehicle delay by 10% or more |
| **5.** ***Local Capacity and Congestion*** Improve local vehicular capacity and reduce congestion within Kihei | **Does the solution:**<br>▪ Improve capacity and increase throughput (number of users) by reducing delay and travel times?<br>**Evaluation Method:** Review results of the travel demand model or operations/simulation model. | -5: Significantly decreases traffic efficiency through or within the study area by worsening vehicle delay by 10% or more<br>-3: Decreases traffic efficiency through or within the study area by worsening vehicle delay by 1 to 9%<br>1: No impact to traffic efficiency |

Exhibit 4-4. Kihei Sub-Area Transportation Plan Evaluation Criteria

| Goals | Evaluation Criteria Category and Description | Evaluation Criteria Scoring |
|---|---|---|
| | | 3: Increases traffic efficiency through or within the study area by improving vehicle delay 1 to 9%<br>5: Significantly increases traffic efficiency through or within the study area by improving vehicle delay by 10% or more |
| **6. Transit**<br>Develop a transit system that addresses the needs of residents and visitors and contributes to sustainable and livable communities | **Does the solution:**<br>▪ Promote increased transit ridership?<br>▪ Improve transit frequency?<br>▪ Improve public transit facilities, such as park-and-rides, bike racks, or bus shelters?<br>**Evaluation Method:** Review existing conditions (transit facilities) and existing transit service. | 1: Does not meet any of the criteria<br>2: --<br>3: Meets at least one criterion<br>4: --<br>5: Meets all three criteria |
| **7. Economic Vitality**<br>Promote the expansion and diversification of Kihei's economy through the efficient and effective use of transportation facilities and amenities | **Does the solution:**<br>▪ Increase access for all modes within Kihei retail districts and employment centers?<br>▪ Improve mobility for residents and visitors along the South Kihei Road commercial corridor?<br>▪ Increase the connections between local and regional roads?<br>▪ Improve movement of service vehicles in congested business districts?<br>**Evaluation Method:** Review existing conditions and/or prepare conceptual project exhibit. | 1: Does not meet any of the criteria<br>2: --<br>3: Meets at least one criterion<br>4: --<br>5: Meets two or more criteria |
| ***8. Cost***<br>Obtain sufficient transportation funding | ▪ What is the estimated cost of the solution?<br>**Considerations*:***<br>▪ Does the project have relatively low project costs or are project costs minimized by building upon previous plans (e.g., through sequenced actions)?<br>▪ Are funding and resources available for implementation within the 5- to 20-year timeframe of the Kihei Sub-area Transportation Plan?<br>▪ Is funding available by non-transportation agencies (e.g. Parks, DLNR, or DOE) or private partners?<br>**Evaluation Method:** Rough order of magnitude cost estimate. | 1: Project is over $1.5 million<br>2: --<br>3: Project is $0.5 to $1.5 million<br>4: --<br>5: Project is under $500 thousand |
| **9. Right-of-way**<br>Minimize impacts to right-of-way | **Does the solution:**<br>▪ Minimize the need for right-of-way acquisition from private property owners?<br>**Evaluation Method:** Consult existing right-of-way maps with parcel lines. Estimate square footage of right-of-way necessary for solution. | 1: Solution requires right-of-way acquisition of developed land or land entitled for future development that is privately owned<br>2: -- |

Exhibit 4-4. Kihei Sub-Area Transportation Plan Evaluation Criteria

| Goals | Evaluation Criteria Category and Description | Evaluation Criteria Scoring |
|---|---|---|
| | | 3: Solution requires right-of-way acquisition from a willing private property owner or undeveloped land<br>4: --<br>5: Solution does not require right-of-way acquisition from private property owner |
| ***10. Land Use***<br>Develop transportation system projects that support the land uses in the study area | **Is the solution:**<br>▪ Consistent with the Maui Island Plan?<br>▪ Consistent with the Kihei Community Plan?<br>▪ Consistent with the HDOT Functional Classification?<br>▪ Applies appropriate access management strategies<br>**Evaluation Method:** Plan and Policy Review and Functional Classification maps | 1: Does not meet any of the criteria<br>2: --<br>3: Meets at least one criterion<br>4: --<br>5: Meets three or more criteria |
| **11. Natural Environment**<br>Preserve and enhance the natural environment | **Does the solution:**<br>▪ Preserve the natural environment and avoid or minimize impacts to natural resources (such as wetlands, streams, and coastal resources)?<br>**Evaluation Method:** Assess known resources identified in State Office of Planning and County GIS – Natural Resource/ Environmental Layers and Physical Features Layers. | 1: Expected to have significant environmental impact requiring EIS-level documentation and review<br>2: --<br>3: Expected to have no significant adverse impact or impacts that can be mitigated to less than significant levels requiring an EA-level of documentation and review.<br>4: --<br>5: Exempt from requirements regarding preparation of an environmental assessment (per HAR §11-200-8) and/or enhances the natural environment. |
| **12. Cultural Resources**<br>Preserve cultural resources | **Does the solution:**<br>▪ Preserve cultural and historic resources and avoid or minimize impacts to them?<br>**Evaluation Method:** Assess known resources identified in State Office of Planning GIS and SHPD Hawaii Register of Historic Places. | 1: Expected to have significant cultural impact requiring EIS-level documentation and review<br>2: --<br>3: Expected to have no significant adverse impact or impacts that can be mitigated to less than significant levels requiring an EA-level of documentation and review.<br>4: --<br>5: Exempt from requirements regarding preparation of an environmental assessment (per HAR §11-200-8) and/or enhances the resources. |
| ***13. Accessibility***<br>Improve the transportation system for people of varying abilities | **Does the solution:**<br>▪ Include accommodations for use by persons with disabilities? | 1: Unrelated to accessibility<br>2: --<br>3: -- |

Exhibit 4-4. Kihei Sub-Area Transportation Plan Evaluation Criteria

| Goals | Evaluation Criteria Category and Description | Evaluation Criteria Scoring |
|---|---|---|
| | ▪ Increase travel options for persons with disabilities?<br>**Evaluation Method:** Review existing conditions and/or prepare conceptual project exhibit. | 4: --<br>5: Includes a component for disability access and/or use |
| **14. Equity**<br>Ensure the fair treatment and meaningful involvement of all populations | **Does the solution:**<br>▪ Provide transportation infrastructure and services to underserved areas of the community?<br>**Evaluation Method:** Review map showing population distribution by socio-economic indicators. | 1. Does not change transportation or transit services to underserved populations.<br>2: --<br>3: --<br>4: --<br>5: Improves transportation or transit services to underserved populations |

Notes:

Group A goals are ***bolded and italicized***, with their rows shaded; Group B goals are **bolded** and are unshaded.

% = percent

EA = environmental assessment

EIS = environmental impact statement

HAR = Hawaii Administrative Rules

SHPD = State Historic Preservation Division

# 4.6 Solution Evaluation and Prioritization

Each potential solution was evaluated against each of the Plan goals, using these measures. A score of 1, 3, or 5 was given, as follows:

- 1: The potential solution does not support the goal.
- 3: The potential solution is not directly related or does not have a significant impact to the goal.
- 5: The potential solution supports the goal.

Scores for the Group A goals were weighted twice as heavily as the scores for the Group B goals.

Three of the goal categories—Complete Streets, Regional Capacity & Mobility, and Local Capacity and Congestion—also contained negative evaluation criteria scoring measures, to reflect the potential of certain projects to negatively impact progress toward achieving those respective goals. Exhibit 2-3, Goals 1, 4, and 5 provide examples of negative scoring criteria.

Once a potential solution had been evaluated against all of the Plan's goals, its scores were summed into a total final grade.

The scores for all of the solutions were compared. It was recognized that assigned numerical scores are a helpful decision-making tool but not the final determination in prioritization. The scores help to reflect the relative advantages and disadvantages of the proposed solutions and provided a common scale so that different types of projects can be compared. In such an evaluation system, the relative positioning of solutions (according to their respective scores) was more important than the value of the scores themselves.

It was also recognized that a plan cannot be developed in a solely mechanical way, and the qualitative attributes of individual solutions were considered and assessed as well. The cost and timeframe to implement a potential solution were important factors.

Exhibit 4-5 reflects the list of solutions based on the scores and cost category. These results were shared with the TAC and CAC and further refined based on their input.

Solution locations are shown in the following maps:

Exhibit 4-6. Safety Projects

Exhibit 4-7. Capacity Projects

Exhibit 4-8. Operations Projects

Exhibit 4-9. Transit Projects

Exhibit 4-10. Drainage and Other Projects

Exhibit 4-5. Complete List of Rankings

| Project Number | Potential Solutions Name | Potential Solutions Description | Planning Level Cost |
|---|---|---|---|
| **Cost Estimate less than $0.5 Million** | | | |
| 83 | Kihei Community Center Right Turn | Right turn only for Kihei Community Center exit. | $97,000 |
| 80 | Piilani Highway and North Kihei Road Left Turn | Modified traffic signal. | $383,000 |
| 78 | Kai Makani and South Kihei Road Crossing | Add a flashing beacon to the existing crosswalk near Kai Makani. | $31,000 |
| 86 | Keawakapu at Kilohana Pedestrian Light | Crosswalk improvement. | $31,000 |
| 15 | Kenolio Road Bike Facility | Build a bike facility along Kenolio Road between Uwapo Road and Ohukai Road. | $44,000 |
| 20 | Pedestrian Crossing at Mai Poina Beach Park | Improve pedestrian facility near Mai Poina Beach Park. | $44,000 |
| 30 | South Kihei Road Shared Roadway (Ohukai Road to Mokulele Highway) | Signed shared roadway. | $78,000 |
| 60 | Auhana Road, Charlie Young Drainage District | Replace the existing 60-inch culvert at Auhana Road. | $158,000 |
| 59 | East Welakahao Road Sign Shared Roadway (South Kihei Road to Piilani Highway) | Provide sign shared roadway for bicycle use. | $179,000 |
| 73 | Kihei Islander #10 Improvements (South Kihei Bus Stop) | New bus stops should be added on South Kihei Road at Leilani Road, which is the midpoint between current stops located 0.5 mile apart at Uwapo Road and Ohukai Road. | $250,000 |
| 10 | Pedestrian Crossing at Kihei Youth Center | Crosswalk on South Kihei Road can be considered; study to verify. | $282,000 |
| 41 | South Kihei Road and Alanui Ke Alii Intersection Improvements | Improve intersection operation at South Kihei Road and Alanui Ke Alii. | $54,000 |
| 67 | Parking for Waipuilani Park | Provide additional street parking for park users. | $18,000 |
| 84 | South Kihei Crosswalk Repavement | Crosswalk repavement on South Kihei Road near Foodland. | $9,000 |
| 9 | Kenolio Road Speed Control | Speed bumps or speed tables are recommended to be placed in front of the Kihei Youth Center to reduce speeds of vehicles. | $11,000 |
| 82 | Kulanihakoi Speed Humps | Speed humps. | $11,000 |
| 81 | E Lipoa Official Bus Stop near Kupalaiki Loop | Official furnished bus stop at East Lipoa Road. | $250,000 |
| **Cost Estimate between $0.5 and $1.5 Million** | | | |
| 2 | Piilani Highway and Uwapo Road | Intersection improvements, connecting existing sidewalks from Uwapo Road to Kaiwahine Street. | $743,000 |
| 19 | Ohukai Sidewalks | Sidewalk connectivity through the corridor. | $809,000 |

Exhibit 4-5. Complete List of Rankings

| Project Number | Potential Solutions Name | Potential Solutions Description | Planning Level Cost |
|---|---|---|---|
| 72 | Kihei Islander #10 Improvements (Piikea Bus Stops) | New bus stops on both sides of Piikea Avenue. These new stops will be provided by the developer of the adjacent property *makai* of Liloa Drive.<br>New bus stops added to Piikea Avenue *mauk*a of Liloa Drive, to serve the Piilani Shopping Center. These stops need to accommodate two buses at a time. This will require a minor route alignment change. The route would continue on Piikea Avenue to right onto Piilani Highway to right onto East Lipoa Street to continue its alignment. | $641,000 |
| 62 | North-South Road, Liilioholo Drainage District | Construct box culverts at the existing North-South Collector Extension concrete ford crossing. | $644,000 |
| 61 | Kanakanui Road, Liilioholo Drainage District | Construct box culverts at the existing Kanakanui Road concrete ford crossing. | $733,000 |
| 79 | Keala Place Sidewalk | Connect existing sidewalks on both sides of Keala Place. | $855,000 |
| 75 | North Kihei Villager Route 15A | North Kihei Villager Route 15A: The North Kihei Villager will operate from Maalaea Harbor as the current Kihei Villager does today. The route will serve the residential area *mauka* of Piilani Highway. The route would turn right onto Ohukai Road and left onto Kenolio Road. From Kenolio Road, the route turns left onto Kaonoulu Street to Piilani Highway, where the route turns right onto Kulanihakoi Street to South Kihei Road, then continues onto Piikea Avenue. The route returns to Maalaea Harbor via Liloa to return to Piikea Avenue, serving the Piilani Shopping Center from an on-street bus stop. | $500,000 |
| 76 | South Kihei Villager Route 15B | South Kihei Villager Route 15B: South Kihei Villager is designed to connect with the North Kihei Villager and the Islander along Piikea Avenue<br>Initially, route would turn around via East Lipoa Street, Liloa Drive, and Piikea Avenue. When demand warrants, the South Kihei Villager will continue on Piikea to Piilani Highway to Lipoa to serve the Industrial Park (segment is shown in the dashed line on the map).<br>This new route provides new service to residential areas along East and West Welakahao Road, Auhana Road, Alanui Ke Alii, Kauhale Street, and Akala Drive. The route would terminate at the current end point of the Kihei Islander at Wailea Iki Drive. | $500,000 |
| 77 | *Mauka-makai* Bus Route on Lipoa Street/Lipoa Parkway | New *mauka-makai* bus route between South Kihei Road and the Maui Research and Technology Park. | $500,000 |
| 69 | Piilani Highway Sidewalk between Piikea Avenue and Lipoa Street | New sidewalk on *makai* side of Piilani Highway between Piikea Avenue and Lipoa Street. | $687,000 |
| 38 | South Kihei Road at Piikea Avenue, Intersection Improvements | Examine potential improvements to non-motorized access and mobility. | $1,151,000 |
| 31 | South Kihei Road Shoreline Erosion (near Kaonoulu Street) | Address shoreline erosion study and protection. | $1,241,000 |

Exhibit 4-5. Complete List of Rankings

| Project Number | Potential Solutions Name | Potential Solutions Description | Planning Level Cost |
|---|---|---|---|
| 66 | Pedestrian Facility on Old Kapu Road | Connection along the old Kapu Road, *mauka* of South Kihei Road, that connects Lokelani School and Kihei Elementary via the two wetlands in the area to the state reservoir (next to St. Theresa's church). | $1,268,000 |
| 63 | Kihei Entryways | Provide an aesthetic landscaped entryway and park at the north end of Kihei, north of the future commercial area. Provide similar Kihei entryway at Piikea Avenue. | $558,000 |
| **Cost Estimate greater than $1.5 Million** | | | |
| 3 | North-South Collector Road - Phase 1B (Kaonoulu Street to Kulanihakoi Street) | Construct new 2-lane road with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, street lighting. | $20,000,000 |
| 4 | North-South Collector Road - Phase 1A (Kulanihakoi Street to E Waipuilani Road) | Construct new 2-lane road with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, street lighting. | $23,000,000 |
| 5 | North-South Collector Road - Liloa Drive (Halekuai Street to E Welakahao Road) - Phase 3 | Construct new 2-lane road with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, street lighting. | $18,204,000 |
| 42 | Piilani Highway - Kihei High School crossing | High School students from Kihei High School need a safe way to cross Piilani Highway. A pedestrian overpass was assumed for this cost estimate. | $8,985,000 |
| 7 | North-South Collector Road - Keala Place to Auhana Road | Construct new 2-lane road with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, street lighting. | $12,081,000 |
| 6 | North-South Collector Road - Liloa Drive (E Welakahao Road to Keala Place) | Construct new 2-lane road with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, street lighting. | $27,111,000 |
| 8 | North-South Collector Road - Auhana Road to Alanui Ke Alii | Construct new 2-lane road with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, street lighting. | $38,409,000 |
| 44 | Old Welakahao Road Extension to Piilani Highway | Residential connections are needed for the area between Welakahao Road and Kanani Road for emergency evacuations. Connect Kupuna Street to Liloa Drive to Piilani Highway. | $6,223,000 |
| 12 | Kihei Greenway | Construct a shared-use path along the North-South Collector route: Kulanihakoi Street to E Waipuilani Road. | $4,355,000 |
| 37 | South Kihei Road Widening (from Piikea Avenue to Lipoa Street) | Widen roadway from two lanes to four lanes with continuous left-turn lane. | $7,024,000 |
| 13 | Kihei Greenway Phase 2 | Construct a shared-use path along the North-South Collector from Halekuai Street to Kilohana Drive. | $9,225,000 |
| 40 | South Kihei Road Bus Turnouts | Build bus turnouts along South Kihei Road, multiple locations along Uwapo Road to Kilohana Drive. | $2,869,000 |

Exhibit 4-5. Complete List of Rankings

| Project Number | Potential Solutions Name | Potential Solutions Description | Planning Level Cost |
|---|---|---|---|
| 36 | South Kihei Road Intersection Improvements (between Piikea Avenue and Lipoa Street) | Roundabout or other intersection operation improvements. | $4,494,000 |
| 28 | South Kihei Road, Kulanihakoi Drainage District | Construct a new bridge at the South Kihei Road crossing and reconstruct the private driveways in the vicinity. | $42,941,000 |
| 35 | Waipuilani Gulch Bridge Replacement | Rebuild bridge across gulch - near East Waipuilani Road. | $55,903,000 |
| 58 | South Kihei and Waiohuli Street Intersection Improvements | Traffic signal, roundabout or other intersection improvement. | $1,798,000 [a] |
| 17 | South Kihei Road and Leilani Road Intersection Improvements | Improve pedestrian facility at the intersection of South Kihei Road and Leilani Road. | $1,799,000 [a] |
| 74 | Kihei Islander #10 Improvements (Bus Services) | Revised Service - Characteristics include the following:<br>Span of Service: 5:30 a.m. to 11 p.m.<br>Headways: 30-minute AM Peak, mid-day, PM Peak, and evening; 90 minute later evening<br>Number of Trips: 17<br>Number of Vehicles: 2<br>Express Services: 6 trips operated with 1 additional vehicle – 3 trips in the AM peak period and 3 trips in the PM peak period will provide additional capacity. | $2,000,000 |
| 29 | South Kihei Road Sidewalks (Uwapo Road to Piikea Avenue) | Sidewalk connectivity through the corridor. | $3,101,000 |
| 85 | South Kihei Road and Kanani Road Intersection Improvements | Intersection improvements. | $4,494,000 |
| 46 | Piilani Highway Bike Path | Provide bikepath on both sides of Piilani Highway. | $12,015,000 |
| 11 | Kihei *Mauka* Bypass - Mokulele Highway to Kanani Road | Build a *mauka* bypass of Piilani Highway from Mokulele Highway to approximately Kanani Road and realign North Kihei Road to the new intersection. | $75,945,000 |
| 41 | South Kihei Road and Alanui Ke Alii Intersection Improvements | Improve intersection operation at South Kihei Road and Alanui Ke Alii. | $54,000 |
| 39 | Pedestrian Facility on Piikea Avenue | Sidewalk connectivity on both sides along the corridor of Piikea Avenue. | $1,618,000 |
| 48 | Piilani Highway and Kaonoulu Street Intersection Improvements | Traffic signal or other intersection improvements. | $1,798,000 |
| 49 | Piilani Highway and Waipuilani Road Intersection Improvements | Traffic signal or other intersection improvements. | $1,798,000 |

Exhibit 4-5. Complete List of Rankings

| Project Number | Potential Solutions Name | Potential Solutions Description | Planning Level Cost |
|---|---|---|---|
| 50 | Piilani Highway and Welakahao Road Intersection Improvements | Traffic signal or other intersection improvements. | $1,798,000 |
| 52 | Piilani Highway and Keonekai Intersection Improvements | Traffic signal or other intersection improvements. | $1,798,000 |
| 23 | South Kihei Road and Kulanihakoi Street Intersection Improvements | Traffic signal, roundabout, or other intersection improvement. | $1,798,000 [a] |
| 24 | South Kihei Road and Kanani Road Intersection Improvements | Traffic signal, roundabout, or other intersection improvement. | $1,798,000 [a] |
| 25 | South Kihei Road and Keonekai Road Intersection Improvements | Traffic signal, roundabout, or other intersection improvement for all modes. | $1,798,000 [a] |
| 26 | South Kihei Road and Namauu Place Intersection Improvements | Traffic signal, roundabout, or other intersection improvement. | $1,798,000 [a] |
| 27 | South Kihei Road and Hoonani Street Intersection Improvements | Traffic signal, roundabout, or other intersection improvement. | $1,798,000 [a] |
| 16 | South Kihei Road and Uwapo Road Intersection Improvements | Traffic signal, roundabout, or other intersection improvement. | $1,799,000 [a] |
| 18 | South Kihei Road and Ohukai Road Intersection Improvements | Traffic signal, roundabout, or other intersection improvement. | $1,799,000 [a] |
| 32 | South Kihei Road Couplet | Create two one-way streets on South Kihei Road and Kenolio between Uwapo and Kaonoulu; South Kihei Road stretch could be one-way northbound and Kenolio one-way southbound. | $3,159,000 |
| 54 | Piilani Highway (pinch location at gulch bridge north of E Welakahao Road) | Widen shoulders for bicycle use at the gulch bridge. | $4,317,000 |
| 70 | South Kihei Road at Keala Place, Intersection Improvements | Examine potential improvements to non-motorized access and mobility. | $4,494,000 |
| 71 | South Kihei Road at Alahele Place, Intersection improvements | Examine potential improvements to non-motorized access and mobility. | $4,494,000 |
| 34 | Kulanihakoi Gulch Bridge Replacement | Rebuild bridges across gulches near Kulanihakoi Street. | $39,034,000 |
| 55 | Piilani Highway (pinch location at gulch bridge north of E Waipuilani Road) | Widen shoulders for bicycle use at the gulch bridges or build a separate bike bridge. | $9,353,000 |
| 56 | Piilani Highway (pinch location at gulch bridge north of Kulanihakoi Street) | Widen shoulders for bicycle use at the gulch bridges or build a separate bike bridge. | $10,790,000 |

Exhibit 4-5. Complete List of Rankings

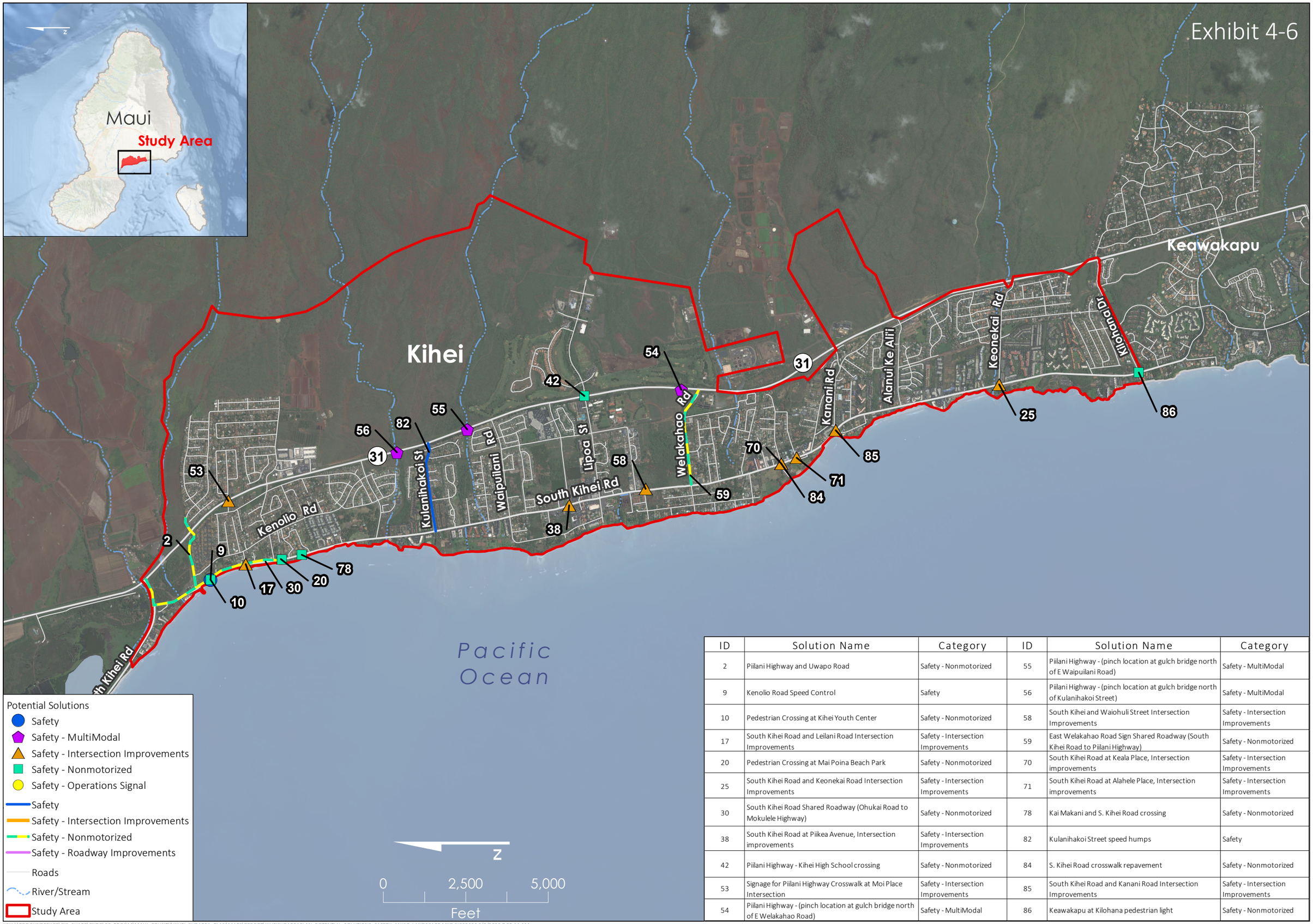
| Project Number | Potential Solutions Name | Potential Solutions Description | Planning Level Cost |
|---|---|---|---|
| 14 | Bike Facility along South Kihei Road | Establish a continuous trail/greenway/ bikeway system from Kealia Pond to Kilohana Road to provide pedestrian lateral accesses to the Kihei-Makena shoreline and to protect and maintain traditional shoreline access. | $71,061,000 |
| 1 | Upcountry Connector | New 2-lane Kihei/Upcountry connection, from Piilani Highway (vicinity of Kaonoulu Street to Haleakala Highway/Haliimaile Road intersection). | $109,645,000 |
| 43 | Aukahi Road Extension | Extend Aukahi Road to South Kihei Road (near Hale Kamaole Co-op) with new sidewalks and traffic signals at new intersections. | $32,667,000 |
| 64 | Multi-use Path on the *Makai* Side of the North-South Collector (Liloa Street) | Multi-use path on the *makai* side of the North-South Collector (Liloa Street) from east Lipoa Street to Welakahao Street. | $2,022,000 |
| 65 | Multi-use Path in Southern Section of Kihei | Multi-use path across the top of Maui Kamaole, Maui Hill, Keawekapu Views, and Kilohana Mauka subdivisions. The easement making these linkages needs to be as direct as possible and at least 15 feet wide. | $3,676,000 |
| 47 | Piilani Highway Landscaped Buffer | Provide a landscape buffer on both sides of Piilani Highway to reduce noise in residential areas. | $1,698,000 |
| **Not Included in the Prioritized List** | | | |
| 33 | South Kihei Pavement Rehabilitation | Locations on South Kihei Road where the pavement condition is poor. | --- |
| 88 | Piilani Pavement Rehabilitation | Locations on Piilani Highway where the pavement condition is poor. | --- |
| 22 | Pedestrian Crossing at Kaonoulu Street | Improve pedestrian facility at the intersection of South Kihei Road and Kaonoulu Street. | $37,000 |
| 45 | Piilani Highway Lighting | Provide clear signage with adequate lighting along Piilani Highway to indicate Kihei access points. | $13,735,000 |
| 21 | South Kihei Road and Kaonoulu Street Intersection Improvements | Traffic signal, roundabout or other intersection improvements. | $1,798,000 |
| **Currently in Progress** | | | |
| 87 | Lipoa Street and Piilani Highway Traffic Signal Modification | Modify traffic signal at Lipoa and Piilani for a longer left-turn signal. | $383,000 |
| 57 | Piilani Highway and Piikea Intersection Improvements | Piilani and Piikea intersection improvement (signal optimization). | $759,000 |
| 53 | Piilani Highway at Moi Place Intersection | Install advance signing and advance stop bars to warn drivers of the potential presence of pedestrians. | $12,000 |
| 51 | Piilani Highway and Kulanihakoi Intersection Improvements | Traffic signal or other intersection improvements. | $1,798,000 |

[a] Estimate cost for signalization. Estimate cost for roundabout is $4,494,000.

# Safety Projects

Exhibit 4-6

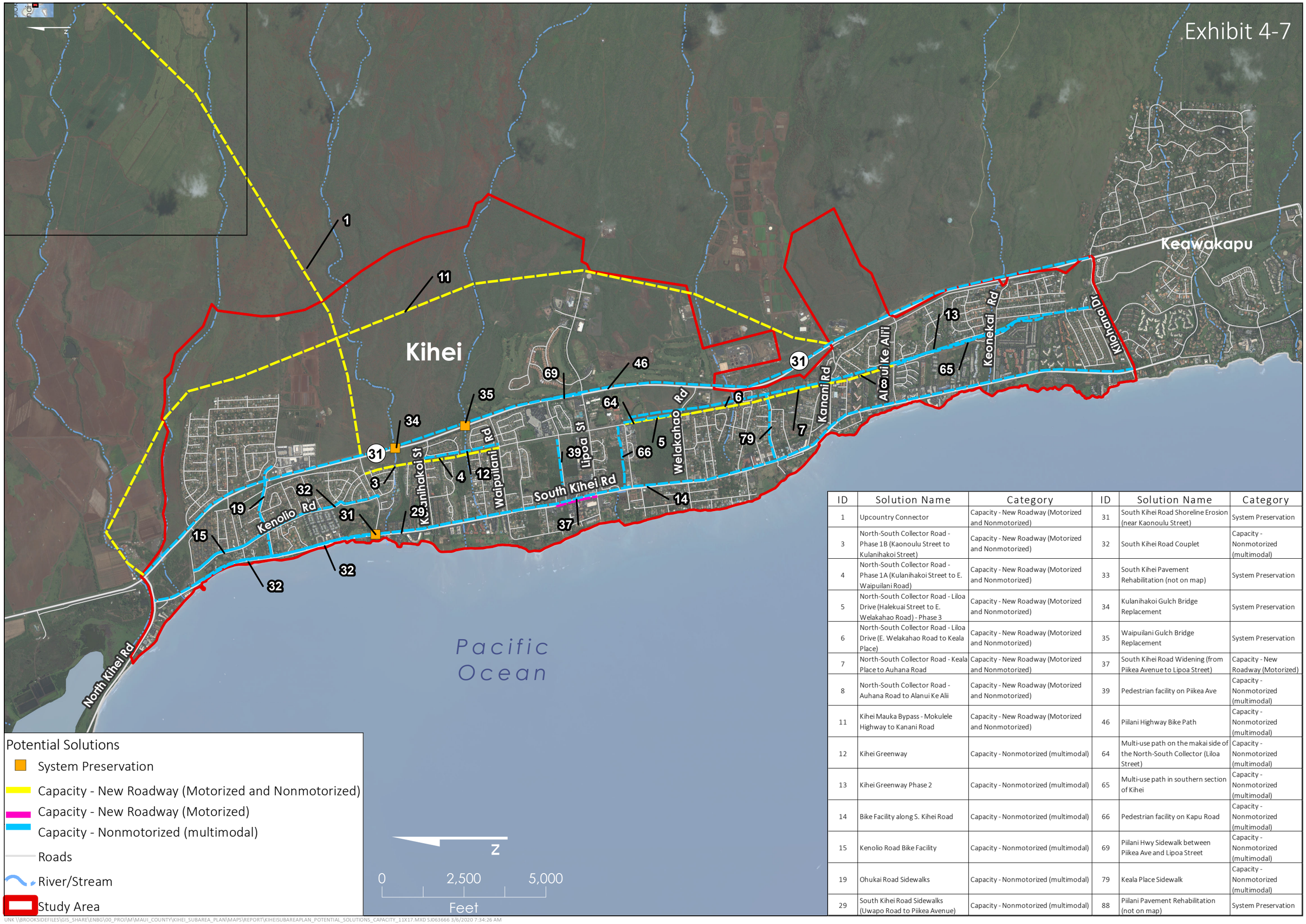



| ID | Solution Name | Category | ID | Solution Name | Category |
|---|---|---|---|---|---|
| 2 | Piilani Highway and Uwapo Road | Safety - Nonmotorized | 55 | Piilani Highway - (pinch location at gulch bridge north of E Waipuilani Road) | Safety - MultiModal |
| 9 | Kenolio Road Speed Control | Safety | 56 | Piilani Highway - (pinch location at gulch bridge north of Kulanihakoi Street) | Safety - MultiModal |
| 10 | Pedestrian Crossing at Kihei Youth Center | Safety - Nonmotorized | 58 | South Kihei and Waiohuli Street Intersection Improvements | Safety - Intersection Improvements |
| 17 | South Kihei Road and Leilani Road Intersection Improvements | Safety - Intersection Improvements | 59 | East Welakahao Road Sign Shared Roadway (South Kihei Road to Piilani Highway) | Safety - Nonmotorized |
| 20 | Pedestrian Crossing at Mai Poina Beach Park | Safety - Nonmotorized | 70 | South Kihei Road at Keala Place, Intersection improvements | Safety - Intersection Improvements |
| 25 | South Kihei Road and Keonekai Road Intersection Improvements | Safety - Intersection Improvements | 71 | South Kihei Road at Alahele Place, Intersection improvements | Safety - Intersection Improvements |
| 30 | South Kihei Road Shared Roadway (Ohukai Road to Mokulele Highway) | Safety - Nonmotorized | 78 | Kai Makani and S. Kihei Road crossing | Safety - Nonmotorized |
| 38 | South Kihei Road at Piikea Avenue, Intersection improvements | Safety - Intersection Improvements | 82 | Kulanihakoi Street speed humps | Safety |
| 42 | Piilani Highway - Kihei High School crossing | Safety - Nonmotorized | 84 | S. Kihei Road crosswalk repavement | Safety - Nonmotorized |
| 53 | Signage for Piilani Highway Crosswalk at Moi Place Intersection | Safety - Intersection Improvements | 85 | South Kihei Road and Kanani Road Intersection Improvements | Safety - Intersection Improvements |
| 54 | Piilani Highway - (pinch location at gulch bridge north of E Welakahao Road) | Safety - MultiModal | 86 | Keawakapu at Kilohana pedestrian light | Safety - Nonmotorized |

# Capacity Projects

Exhibit 4-7




| ID | Solution Name | Category | ID | Solution Name | Category |
|---|---|---|---|---|---|
| 1 | Upcountry Connector | Capacity - New Roadway (Motorized and Nonmotorized) | 31 | South Kihei Road Shoreline Erosion (near Kaonoulu Street) | System Preservation |
| 3 | North-South Collector Road - Phase 1B (Kaonoulu Street to Kulanihakoi Street) | Capacity - New Roadway (Motorized and Nonmotorized) | 32 | South Kihei Road Couplet | Capacity - Nonmotorized (multimodal) |
| 4 | North-South Collector Road - Phase 1A (Kulanihakoi Street to E. Waipuilani Road) | Capacity - New Roadway (Motorized and Nonmotorized) | 33 | South Kihei Pavement Rehabilitation (not on map) | System Preservation |
| 5 | North-South Collector Road - Liloa Drive (Halekuai Street to E. Welakahao Road) - Phase 3 | Capacity - New Roadway (Motorized and Nonmotorized) | 34 | Kulanihakoi Gulch Bridge Replacement | System Preservation |
| 6 | North-South Collector Road - Liloa Drive (E. Welakahao Road to Keala Place) | Capacity - New Roadway (Motorized and Nonmotorized) | 35 | Waipuilani Gulch Bridge Replacement | System Preservation |
| 7 | North-South Collector Road - Keala Place to Auhana Road | Capacity - New Roadway (Motorized and Nonmotorized) | 37 | South Kihei Road Widening (from Piikea Avenue to Lipoa Street) | Capacity - New Roadway (Motorized) |
| 8 | North-South Collector Road - Auhana Road to Alanui Ke Alii | Capacity - New Roadway (Motorized and Nonmotorized) | 39 | Pedestrian facility on Piikea Ave | Capacity - Nonmotorized (multimodal) |
| 11 | Kihei Mauka Bypass - Mokulele Highway to Kanani Road | Capacity - New Roadway (Motorized and Nonmotorized) | 46 | Piilani Highway Bike Path | Capacity - Nonmotorized (multimodal) |
| 12 | Kihei Greenway | Capacity - Nonmotorized (multimodal) | 64 | Multi-use path on the makai side of the North-South Collector (Liloa Street) | Capacity - Nonmotorized (multimodal) |
| 13 | Kihei Greenway Phase 2 | Capacity - Nonmotorized (multimodal) | 65 | Multi-use path in southern section of Kihei | Capacity - Nonmotorized (multimodal) |
| 14 | Bike Facility along S. Kihei Road | Capacity - Nonmotorized (multimodal) | 66 | Pedestrian facility on Kapu Road | Capacity - Nonmotorized (multimodal) |
| 15 | Kenolio Road Bike Facility | Capacity - Nonmotorized (multimodal) | 69 | Piilani Hwy Sidewalk between Piikea Ave and Lipoa Street | Capacity - Nonmotorized (multimodal) |
| 19 | Ohukai Road Sidewalks | Capacity - Nonmotorized (multimodal) | 79 | Keala Place Sidewalk | Capacity - Nonmotorized (multimodal) |
| 29 | South Kihei Road Sidewalks (Uwapo Road to Piikea Avenue) | Capacity - Nonmotorized (multimodal) | 88 | Piilani Pavement Rehabilitation (not on map) | System Preservation |

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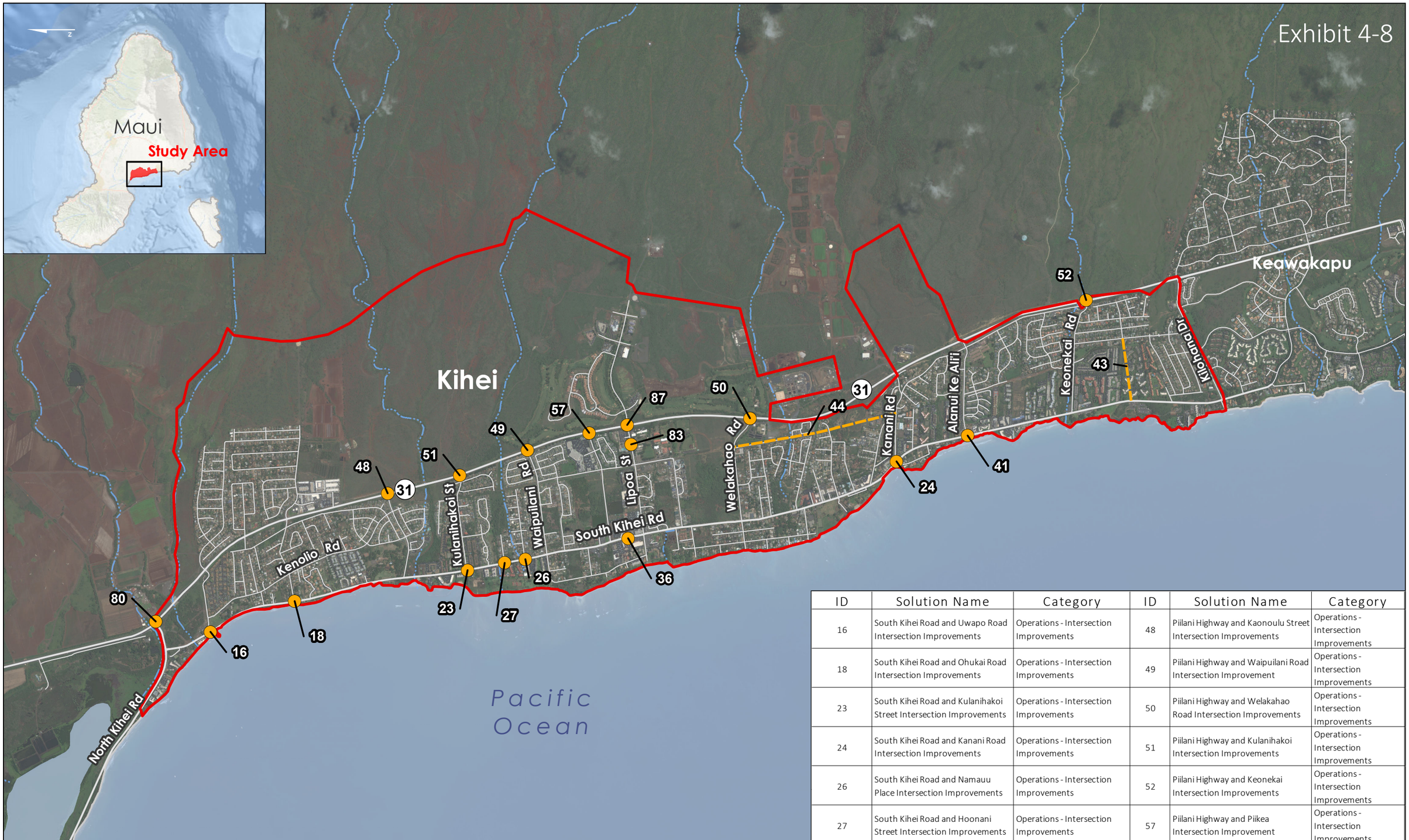
# Operations Projects

Exhibit 4-8




| ID | Solution Name | Category | ID | Solution Name | Category |
|---|---|---|---|---|---|
| 16 | South Kihei Road and Uwapo Road Intersection Improvements | Operations - Intersection Improvements | 48 | Piilani Highway and Kaonoulu Street Intersection Improvements | Operations - Intersection Improvements |
| 18 | South Kihei Road and Ohukai Road Intersection Improvements | Operations - Intersection Improvements | 49 | Piilani Highway and Waipuilani Road Intersection Improvement | Operations - Intersection Improvements |
| 23 | South Kihei Road and Kulanihakoi Street Intersection Improvements | Operations - Intersection Improvements | 50 | Piilani Highway and Welakahao Road Intersection Improvements | Operations - Intersection Improvements |
| 24 | South Kihei Road and Kanani Road Intersection Improvements | Operations - Intersection Improvements | 51 | Piilani Highway and Kulanihakoi Intersection Improvements | Operations - Intersection Improvements |
| 26 | South Kihei Road and Namauu Place Intersection Improvements | Operations - Intersection Improvements | 52 | Piilani Highway and Keonekai Intersection Improvements | Operations - Intersection Improvements |
| 27 | South Kihei Road and Hoonani Street Intersection Improvements | Operations - Intersection Improvements | 57 | Piilani Highway and Piikea Intersection Improvement | Operations - Intersection Improvements |
| 36 | South Kihei Road Intersection Improvements (between Piikea Avenue and Lipoa Street) | Operations - Intersection Improvements | 80 | Piilani Hwy and N. Kihei Road Left Turn | Operations - Intersection Improvements |
| 41 | South Kihei Road and Alanui Ke Alii Intersection Improvement | Operations - Intersection Improvements | 83 | Kihei Community Center right turn | Operations - Intersection Improvements |
| 43 | Aukahi Road Extension | Operations - Roadway Improvements | 87 | Lipoa St and Piilany Hwy Traffic Signal Modification | Operations - Intersection Improvements |
| 44 | Old Welakahoa Road Extension to Piilani Highway | Operations - Roadway Improvements | | | |

# Transit Projects

Exhibit 4-9


| ID | Solution Name | Category |
|---|---|---|
| 40 | South Kihei Bus Turnouts | Transit Improvement |
| 72 | Kihei Islander #10 Improvements (Piikea Bus Stops) | Transit Improvement |
| 73 | Kihei Islander #10 Improvements (South Kihei Bus Stop) | Transit Improvement |
| 74 | Kihei Islander #10 Improvements (Bus Services)- (not shown on map) | Transit Improvement |
| 75 | North Kihei Villager Route 15A | Transit Improvement |
| 76 | South Kihei Villager Route 15B | Transit Improvement |
| 77 | Mauka-makai bus route on Lipoa St/Lipoa Parkway | Transit Improvement |
| 81 | E Lipoa official bus stop near Kupalaiki Loop | Transit Improvement |

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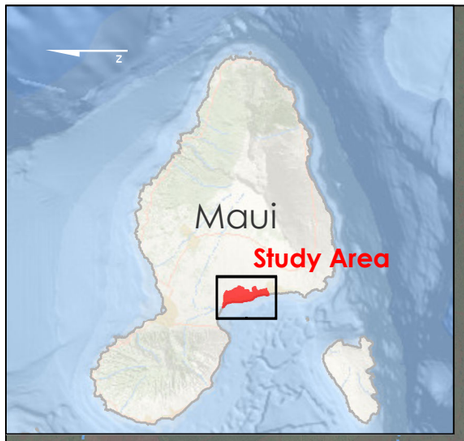
# Drainage and Other Projects

Exhibit 4-10




Kihei

Keawakapu

Pacific Ocean

Kenolio Rd

South Kihei Rd

North Kihei Rd

Kulanihakoi St

Waipuilani Rd

Lipoa St

Welakahao Rd

Kanani Rd

Alanui Ke Alii

Keonekai Rd

Kilohana Dr

31

63

47

60

61

62

28

67

Potential Solutions
- Drainage Improvement
- Other - Landscaping
- Other - Parking
- Other - Landscaping
- Drainage Improvement
- Roads
- River/Stream
- Study Area

N

0 2,500 5,000

Feet

| ID | Solution Name | Category |
|---|---|---|
| 28 | South Kihei Road, Kulanihakoi Drainage District | Drainage Improvement |
| 47 | Piilani Highway Landscaped Buffer | Other - Landscaping |
| 60 | Auhana Road, Charlie Young Drainage District | Drainage Improvement |
| 61 | Kanakanui Road, Liilioholo Drainage District | Drainage Improvement |
| 62 | North-South Road, Liilioholo Drainage District | Drainage Improvement |
| 63 | Kihei Entryways | Other - Landscaping |
| 67 | Parking for Wapuilani Park | Other - Parking |

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Implementation of solutions will require continued engagement in planning, significant funding commitments, and intelligent investment and management strategies.

# Implementation

Chapter 5

Without effective implementation, plans for near- and long-term solutions related to enhanced mobility, safety, and congestion mitigation for the Kihei area will never be realized. One of the key purposes of the Kihei Sub-area Transportation Plan is to provide a clear path forward toward implementing effective solutions. This path forward will require continued engagement in planning, significant funding commitments, intelligent investment and management strategies, and the ability to measure progress over time.

Chapter 5 addresses these needs through closer looks at the priority solutions recommended for implementation as well as the project life cycle in relation to implementation. Specifically, this chapter examines the following:

- Priority solutions for implementation
- The project life cycle
- Projected funding sources
- Support of cross sector planning and policy initiatives
- Performance measures and monitoring

## 5.1 Priority Solutions for Implementation

The discussion of the implementation of priorities should always begin with a reminder of the primary purpose of this planning effort to develop near- and long-term solutions to address safety, congestion, and mobility needs in the Kihei area. To support this purpose, the Project team, with extensive input from FHWA, HDOT, the Maui County TAC, the local Kihei CAC, and the public, finalized a list of 14 goals and their supporting objectives (Exhibit 2-1). The solutions that were studied and ranked were scored on criteria specifically representing these 14 categories of goals and objectives.

### 5.1.1 Scoring System and Groupings

As described in Chapter 4, by examining stakeholder input, past plans and studies, data collection related to safety and congestion, and traffic simulations and models, the Project team developed 88 potential solutions to achieve the goals and objectives of this Plan. These solutions were each scored across 14 different evaluation criteria to measure how well the solutions serve the goals of the Plan. Because each solution was scored across all goal categories, those with the higher total cumulative scores represent the most comprehensively beneficial solutions to be implemented across the Project Area.

While each individual solution achieved an overall score ranking, the solutions were grouped into cost categories. Exhibits 4-1, 4-2, and 4-3 list the ranked solutions by three cost categories. These groupings will help guide county officials as they continue to program and obligate project funds, allowing for greater transparency among other

stakeholders and the public on why and how decisions to implement projects are being made.

> The prioritized project list is a tool to help agencies determine which projects and sequence will best serve Kihei's transportation needs.

For example, if county officials have a balance of funds that must be obligated by a certain fixed date, they can quickly select the higher ranked projects in the appropriate cost category for further consideration.

Project timeframe is also an important consideration of when a project may be selected to proceed to the project delivery phase. Potential solutions with right-of-way needs often take longer to develop and construct then a solution that may not require right-of-way. Higher-cost projects and longer timeframes frequently require more advanced planning, environmental research, permitting, design and engineering, and disclosures and are typically more complex. These are important considerations if there is a need to implement a short-term project solution.

Approximately 23 of the 88 solutions (roughly 25 percent) examined in this Plan are anticipated to require right-of-way acquisitions. Exhibit 5-1 lists the solutions that are expected to require additional right-of-way. However, land ownership and property rights are continually changing. In addition, the anticipated property needs of some solutions will fluctuate as the project is more fully developed as it proceeds through project delivery (environmental and design phases).

Exhibit 5-1. Solutions with Anticipated Additional Right-of-way Needs

| Project Number | Solution Name | Solution Category |
|---|---|---|
| 1 | Upcountry Connector | Capacity – New Roadway |
| 5 | North-South Collector Road - Liloa Drive (Halekuai Street to E Welakahao Road) - Phase 3 | Capacity – New Roadway |
| 6 | North-South Collector Road - Liloa Drive (E Welakahao Road to Keala Place) | Capacity – New Roadway |
| 8 | North-South Collector Road - Auhana Road to Alanui Ke Alii | Capacity – New Roadway |
| 11 | Kihei *Mauka* Bypass - Mokulele Highway to Kanani Road | Capacity – New Roadway |
| 12 | Kihei Greenway | Capacity – Non-motorized (multimodal) |
| 14 | Bike Facility along South Kihei Road | Capacity – Non-motorized (multimodal) |
| 37 | South Kihei Road Widening (from Piikea Avenue to Lipoa Street) | Capacity – New Roadway |
| 40 | South Kihei Road Bus Turnouts | Transit Improvement |
| 43 | Aukahi Street Extension | Operations - Roadway Improvements |
| 46 | Piilani Highway Bike Path | Capacity - Non-motorized (multimodal) |
| 54 | Piilani Highway (pinch location at gulch bridge north of E Welakahao Road) | Safety - Multimodal |
| 55 | Piilani Highway (pinch location at gulch bridge north of E Waipuilani Road) | Safety - Multimodal |
| 56 | Piilani Highway (pinch location at gulch bridge north of Kulanihakoi Street) | Safety - Multimodal |
| 64 | Multi-use Path on the *Makai* Side of the North-South Collector (Liloa Street) | Capacity - Non-motorized (multimodal) |
| 65 | Multi-use Path in Southern Section of Kihei | Capacity - Non-motorized (multimodal) |
| 66 | Pedestrian Facility on Kapu Road | Capacity - Non-motorized (multimodal) |
| 69 | Piilani Highway Sidewalk between Piikea Avenue and Lipoa Street | Capacity - Non-motorized (multimodal) |
| 72 | Kihei Islander #10 Improvements (Piikea Bus Stops) | Transit Improvement |

## 5.1.2 Recommended Priorities

Based on the results of the evaluation criteria, discussions with the TAC and CAC, and consideration of project costs and timeframe, potential solutions were prioritized within each cost category. The summaries of the highest ranked projects in each cost category are presented here. Additional information on each project may be found in project sheets included in Appendix B.

### 5.1.2.1 Cost Estimate Less than $500,000

1. **Kihei Community Center Right Turn (Project 83)**—The project adds a right-turn-only lane to the Kihei Community Center exit to East Lipoa Street.
2. **Piilani Highway and North Kihei Road Left Turn (Project 80)**—This safety project involves modifying the existing traffic signal so that it can detect bikers who need to turn left.
3. **Lipoa Street and Piilani Highway Traffic Signal Modification (Project 87)**—This traffic signal optimization project involves modifying the traffic signal to lengthen the duration of the left-turn signal.

### 5.1.2.2 Cost Estimate between $500,000 and $1,500,000

1. **Piilani Highway and Uwapo Road (Project 2)**—The project consists of intersection improvements connecting existing sidewalks from Uwapo Road to Kaiwahine Street, where there currently are no sidewalks.
2. **Ohukai Sidewalks (Project 19)**—This project consists of connecting and filling gaps of missing sidewalks along Ohukai Road.
3. **Kihei Islander #10 Improvements (Piikea Bus Stops) (Project 72)**—This is a transit improvement project involving (1) new bus stops on both sides of Piikea Avenue, to be provided by the developer of the adjacent property *makai* of Liloa Drive, and (2) new bus stops added to Piikea Avenue *mauka* of Liloa Drive to serve the Piilani Shopping Center. These stops need to accommodate two buses at a time, which will require a minor route realignment.
4. **Piilani Highway and Piikea Intersection Improvements (Project 57)**—This is a traffic signal optimization project. A longer green light on Piikea Avenue is needed for cars wanting to turn left onto Piilani Highway. In addition, there is a proposal to convert the existing median at this intersection into a second left-turn lane.
5. **North-South Road, Liilioholo Drainage District (Project 62)**—This is a drainage improvement and storm water conveyance project in coordination with the future Southwest Maui Watershed Plan. The project will involve construction of new box culverts at the existing North-South Collector Extension concrete ford crossing.
6. **Kanakanui Road, Liilioholo Drainage District (Project 61)** —This is a drainage improvement and storm water conveyance project in coordination with the future Southwest Maui Watershed Plan. The project will involve construction of new box culverts at the existing Kanakanui Road concrete ford crossing.
7. **Keala Place Sidewalks (Project 79)**—This project will install needed new sidewalks, as none currently exist along much of Keala Place between South Kihei Road and Liloa Drive.

### 5.1.2.3 Cost Estimate greater than $1,500,000

The top six solutions in this cost category involve different phases of the North-South Collector Road project, comprising the construction of a new 2-lane road with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, and street lighting (Projects 3 through 8). The total cost of all six phases is estimated at over $155 million. As such, complex programming and project delivery phases are anticipated, along with extended time to completion. The following presents those project phases, in order of ranking:

1. **North-South Collector Road – Phase 1B (Kaonoulu Street to Kulanihakoi Street) (Project 3)**
2. **North-South Collector Road – Phase 1A (Kulanihakoi Street to E Waipuilani Road) (Project 4)**
3. **North-South Collector Road - Liloa Drive (Halekuai Street to E Welakahao Road) (Project 5)**
4. **North-South Collector Road - Keala Place to Auhana Road (Project 7)**
5. **North-South Collector Road - Liloa Drive (EWelakahao Road to Keala Place) (Project 6)**
6. **North-South Collector Road - Auhana Road to Alanui Ke Alii Drive (Project 8)**

The following two additional projects ranked within the top eight solutions in this cost category:

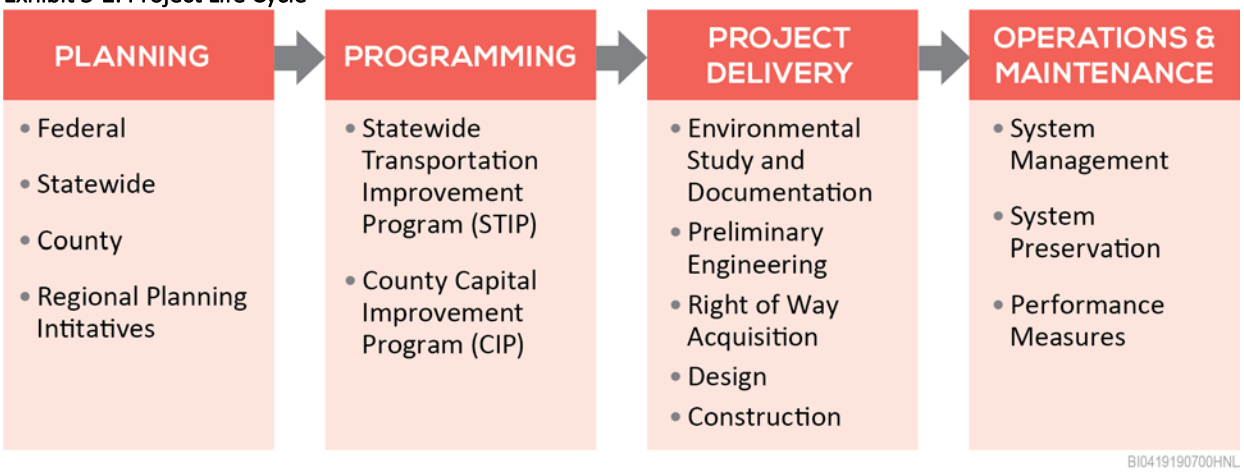
1. **Piilani Highway - Kihei High School Crossing (Project 42)**—This project would construct a pedestrian overpass or underpass to cross Piilani Highway, to improve both safety and road capacity.
2. **Old Welakahao Road Extension to Piilani Highway (Project 44)**—This project addresses the need for new roadways (residential connectors) in the area between Welakahao Road and Kanani Road, for emergency evacuations.

# 5.2 The Project Life Cycle

A typical project life cycle, illustrated in **Exhibit 5-2**, is composed of four major phases: planning, programming, project delivery, and operation and maintenance. When thinking of solution implementation, it is common and appropriate to focus on the programming and project delivery phases of the project life cycle. However, successful solution implementation also contains elements of planning and operation and maintenance.

In relation to specific projects or solutions, planning should always precede other steps in the life cycle to ensure the project will serve the greater goals and objectives of the region. The programming of the project budget and project delivery processes are key parts of the project life cycle that often determines the feasibility of a project.

**Exhibit 5-2. Project Life Cycle**




## 5.2.1 Planning

Planning, which includes studies like this one, is the first step in the project life cycle. Many of the goals, objectives, and solutions examined and ranked within this Plan originated within other planning efforts. In addition, a large number of plans and studies across many sectors support transportation planning efforts, and vice versa. For example, land use planning efforts directly impact transportation planning needs, and planned transportation projects influence land use development plans.

It is important to note that while the illustration of the project life cycle appears linear, planning efforts are iterative, as the state and condition of both the natural and built environments are constantly in flux. Active participation in planning efforts remains critical for successful implementation of these solutions, and sustained progress toward the Plan's goals.

It is assumed that stakeholders and contributors to this Plan will remain engaged in ongoing transportation planning and policy adoption efforts. Such efforts include state and county bike and pedestrian plans, Complete Streets policy updates, Federal-Aid Highways 2045 Transportation Plan—Statewide and for the District of Maui, Maui Regional Transportation Plans, and HDOT Statewide Transportation Improvement Program (STIP) and Maui MPO TIP updates, among others.

### 5.2.2 Programming

Programming includes identifying funding sources for the project and completing the allocation protocols of the various sources. For transportation projects, the two primary funding sources are the STIP and local budgets, typically capital improvement programs (CIPs). The STIP connects projects to specific funding programs and allocates funds to implement solutions over a four-year period. The statewide STIP is supported and informed by the Maui MPO's Transportation Improvement Program (TIP), which must be approved by the Maui MPO Policy Board and the Governor or Governor's designee before it is included in its entirety in the STIP.

The HDOT and Maui MPO have established processes for adding projects to the current 2011-2014 STIP and 2019-2022 TIP through revisions; alternatively, projects can be added to future STIPs and TIPs via participation in the respective preparation processes.

CIP budgets are usually contained within local fiscal year or biennium budgets. In Maui County, the CIP budget is part of the overall County budget, which is proposed annually by the Mayor and adopted by the County Council. The County CIP budget covers a 6-year period: the base fiscal year (FY) of the budget plus 5 additional years.

### 5.2.3 Project Delivery

The project delivery phase includes the environmental studies, environmental clearance (NEPA/HEPA documentation), preliminary engineering, design for construction, and bidding for and management of construction. During the project delivery phase, a more thorough environmental and engineering analysis is conducted on a project's feasibility. During this time, a project will further evolve and may change or be refined from the initial higher-level analysis conducted in the earlier planning stages. Sometimes these changes require modified or new environmental clearances or additional right-of-way. These projects changes can add costs that need to be programmed or delay the anticipated timeline for completion. The project life cycle is thus not always linear or predictable, and the ranking of the solution may not always be a clear indication of feasibility.

### 5.2.4 Context Sensitive Solutions

The Kihei Sub-area Transportation Plan recommendations were developed using a context sensitive solutions (CSS) framework. According to FHWA, CSS is defined as:

*"a collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting. It is an approach that leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions."*
(AASHTO/FHWA, 2007)

An important component of CSS is context sensitive design or ensuring that design and construction of projects incorporate understanding of the natural and built environment as well as community and cultural aspects. FHWA identifies the following characteristics for context sensitive designs:

- The project is in harmony with the community, and it preserves environmental, scenic, aesthetic, historic, and natural resource values of the area.
- The project is a safe facility for all users and the community.
- The project solves problems and satisfies the purpose and needs identified by a full range of stakeholders.
- The project exceeds the expectations of both designers and stakeholders and is perceived as adding lasting value to the community as a whole.
- The project involves efficient and effective use of resources (time, budget) of all involved parties.

As the Kihei Sub-area Transportation Plan ranked solutions are implemented, the work will be done with a context-sensitive approach.

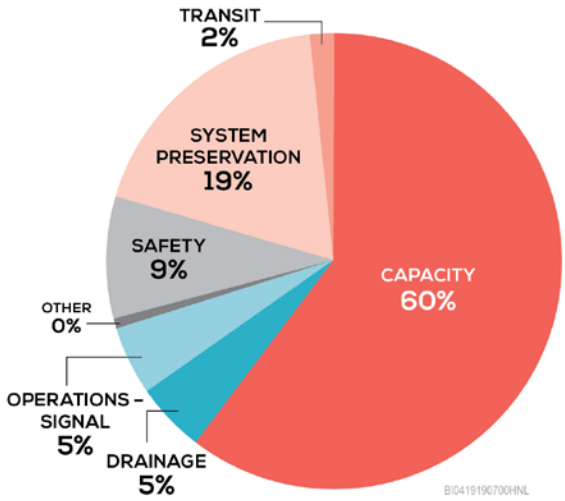
## 5.3 Projected Funding Sources

The Kihei Sub-area Transportation Plan project team acknowledges the limited amount of available transportation funds. The prioritization and categorization processes adhered to in this Plan were designed so that the resulting rankings would assist decisionmakers to responsibly allocate funds to worthy projects.

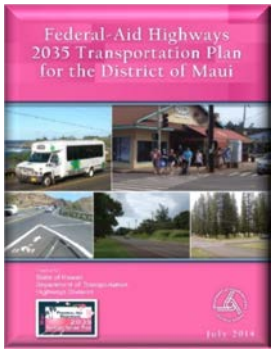
It is important to note that the total of all cost estimates for the 88 ranked solutions presented in this Plan equals approximately $925 million. Of this total, approximately 60 percent ($558 million) is for capacity solutions, 19 percent ($174 million) is for system preservation solutions, and the remaining 21 percent ($192 million) is divided amongst the other categories of solutions, as shown in **Exhibit 5-3**. This chart quickly illustrates the high

cost of capacity solutions (inclusive of multimodal and new roadways solutions) for the Kihei area.

**Exhibit 5-3. Estimated Costs by Category**




Considering the high cost required to address Kihei's transportation needs, this section discusses potential federal, state, and local (County of Maui) funding sources for implementation of the Kihei Sub-area Transportation Plan's recommended solutions. The information presented is consistent with the *Federal-Aid Highways 2035 Transportation Plan for the District of Maui* (HDOT, 2014).




Transportation funding in the state of Hawaii comes from a combination of federal, state, and local funds. Hawaii, like many other states, does not have unlimited transportation funding to meet all its transportation needs.

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

When adjusted for inflation, federal and state revenues available for all transportation projects – including operations and maintenance – between FY 2011 and FY 2035 would total approximately $7.01 billion. However, this is for all transportation projects statewide. A specific breakdown for Maui is discussed in the following sections, along with more information on federal, state, and local funding sources.

## 5.3.1 Federal Funding

To present a conservative estimate of available federal funds, one can assume a constant average amount of approximately $152 million annually for the state of Hawaii.

Federal funds come from the Highway Trust Fund and are raised primarily through the federal gas tax. Federal funding is largely intended for the maintenance and construction of the federal highway system and for major arterials and collectors that feed into the highway system.

The adoption of MAP-21 in July 2012 changed federal funding methods for future fiscal years. MAP-21 changed the way program funding is distributed to individual states. Previously, core federal highway programs distributed funds to states using individual formulas. With new legislation, a proportional lump sum is distributed to states (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.

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. Most of the policies and regulations of the FAST Act (signed in 2015) are consistent with MAP-21.

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 without additional funds.

## 5.3.2 State Funding

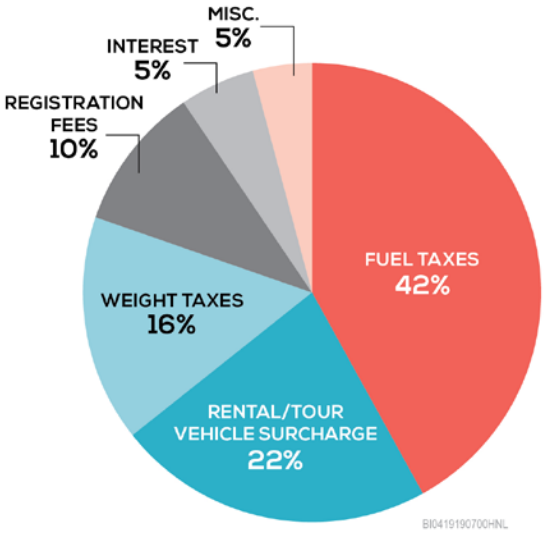
State funds come from the following six primary sources:

- Highway fuel license tax
- Vehicle registration fees
- Weight taxes

- Rental/tour vehicle surcharge
- Interest
- Miscellaneous

As noted in the *Federal-Aid Highways 2035 Transportation Plan for the District of Maui,* 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. Exhibit 5-4 represents the breakdown of revenues by sources (FY 2011).

Exhibit 5-4. Fiscal Year 2011 Breakdown of Revenues by Source




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.

## 5.3.3 Maui District Funding

According to the *Federal-Aid Highways 2035 Transportation Plan for the District of Maui*, historically Maui has received approximately 23 percent of the federal and state highway funds. Based on historical distributions, Maui District could expect to receive approximately $1.6 billion for transportation projects between FY 2011 and FY 2035, an average of $64 million per year, as shown in Exhibit 5-5.

STIP programming focuses on a short-term timeframe and contributes to implementing the long-term vision for the transportation system identified in the *Federal-Aid Highways 2035 Transportation Plan for the District of Maui.* To be eligible to receive funding through the STIP, the solutions recommended in this Plan must support the priorities identified in the *Federal-Aid Highways 2035 Transportation Plan for the District of Maui*.

The Maui MPO is a federally mandated government agency formed in 2016 by the State of Hawaii and the County of Maui to facilitate comprehensive planning for federally funded or regionally significant transportation systems on the island of Maui. *Hele Mai Maui 2040 Long Range Transportation Plan,* the MPO's first long-range planning document, was adopted by its Policy Board in December 2019. Moving forward, to be eligible to receive funding through the TIP, the solutions recommended in this Plan must support the priorities identified in *Hele Mai Maui 2040*. The Maui MPO has been involved in the development of this Plan as a member of the TAC and the solutions recommended are consistent with the goals and objectives of *Hele Mai Maui 2040*.

hele mai maui
Long-Range Transportation Plan 2040

Based on historic spending, stakeholder values, needs, and plan goals, the *Federal-Aid Highways 2035 Transportation Plan for the District of Maui* provides the future funding distribution by program for Maui. This is also consistent with the FAST Act and MAP-21 and is shown in Exhibit 5-6.

Exhibit 5-5. Anticipated Federal and State Highway Funds based on historic rate projections ($ million)

| Program | Annual Total | Maui District Annual | FY 2011-2035 Total | Maui District Total |
|---|---|---|---|---|
| Federal | $152 | $35 | $3,800 | $874 |
| State | $126 | $29 | $3,150 | $725 |
| TOTAL | $278 | $64 | $6,950 | $1,599 |

Exhibit 5-6. Future Funding Distribution by Program

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

## 5.3.4 County Funding

The County of Maui also has limited funding availability. The County has a 6-year CIP in which it lists future capital investments. Maui County Code Chapter 3.04.010 defines a capital improvement as "a permanent improvement or betterment as distinguished from ordinary repair or current maintenance." According to the County, the funds outlined in Exhibit 5-7 are allocated for FY 2019 for the entire county – for all projects island-wide, not just transportation. This provides a basis of understanding of the level of funding available for potential Kihei transportation solutions.

Exhibit 5-7. FY 2019 Capital Budget Summary by Fund Type

| Name of Fund | FY 2019 Adopted |
|---|---|
| Bikeway Fund | $140,000 |
| Federal Fund | $12,700,000 |
| General Fund (CIP) | $15,564,000 |
| General Obligation Fund | $69,560,000 |
| Highway Fund (CIP) | $13,116,792 |
| Lapsed Bond Fund | $2,195,000 |
| Park Assessment | $2,802,000 |
| Solid Waste Management Fund | $1,400,000 |
| State Fund | $9,775,000 |
| State Revolving Loan Fund | $18,350,000 |
| Wastewater Fund | $12,345,000 |
| Water Supply Fund – Restricted | $4,800,000 |
| Water Supply Fund – Unrestricted | $18,950,000 |
| **TOTAL** | **$181,697,792** |

As shown in Exhibit 5-8, Kihei-Makena will receive $15,287,000 in CIP funds in FY 2019, or 8.4 percent of total CIP budget. However, not all of this amount is slated for transportation projects. For roadway and drainage projects specifically, the County of Maui Department of Public Works CIP budget contains $3.0 million for FY 2019 and a total of $24.2 million for the entire 6-year period for the Kihei-Makena district (see Exhibit 5-9). This suggests an approximate average of $4 million per year in County CIP funding that is traditionally spent on drainage- and transportation-related projects in Kihei-Makena. However, over 67 percent of this total ($16.4 million) is federal funding (County of Maui, 2018 [749-52]).

Exhibit 5-8. FY 2019 Capital Budget Summary by District

| Name of Fund | FY 2019 Adopted |
|---|---|
| Countywide | $45,862,792 |
| Hana | $5,370,000 |
| Kihei-Makena | $15,287,000 |
| Lanai | $2,830,000 |
| Makawao-Pukalani-Kula | $21,250,000 |
| Molokai | $3,185,000 |
| Paia-Haiku | $3,350,000 |
| Wailuku-Kahului | $66,090,000 |
| West Maui | $18,473,000 |
| **TOTAL** | **$181,697,792** |

An additional $47.3 million is budgeted for countywide roadway improvement projects during the 6-year CIP. If the 8.4 percent proportion of Kihei-Makena district funding were to be applied to this total, one could approximate that $3.97 million in countywide funds would be applied within the Kihei-Makena district (County of Maui, 2018 [749-52]).

The County of Maui Department of Transportation received a 6-year total of $3.150 million in CIP funds. However, all of this is obligated for one project in the Wailuku-Kahului district (Central Maui transit Hub) (County of Maui, 2018 [809-12]).

Exhibit 5-9. FY 2019 Capital Budget Department of Public Works; Project Details for Kihei-Makena District

| Project Type | Project Name | Fund | 2019 | 2020-2024 | 6-Year Total |
|---|---|---|---|---|---|
| Drainage | South Maui Drainline Repairs | GB | 2,300 | -0- | 2,300 |
| Road Improvements | North South Collector Road (Lokelani School to Auhana Road) | GB | -0- | 1,400 | 1,400 |
| | North South Collector Road (Namauu Place to Kulanihakoi Street) | FD | -0- | 10,400 | 10,400 |
| | | GB | 500 | 2,600 | 3,100 |
| | South Kihei Road, Phase IV | FD | -0- | 6,000 | 6,000 |
| | | HF | -0- | 800 | 800 |
| | South Kihei Road Sidewalk Improvements | HF | 200 | -0- | 200 |
| **TOTAL** | | | **3,000** | **21,200** | **24,200** |

Notes:

FD = Federal funds

GB = General Obligation Bond

HF = Highway Fund

## 5.3.5 Funding Strategies for Priority Projects

While the Plan's rankings will help identify priorities, the total list of ranked solutions identified during the Kihei Sub-Area Transportation planning effort will outstrip the availability of federal, state, and local funding. Federal, state, and local funding sources have not kept up with the demands for the 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.

Implementation of certain Kihei projects may require a variety of methods and potential alternative revenue sources such as the following:

- Mileage-based user fees – Drivers pay a fee based on the number of miles traveled on public roadways. Mileage could be tracked through various methods and prices set based on congestion, location of travel, type of road, or a flat fee per mile.

  In 2019, the HDOT began the Hawaii Road Usage Charge demonstration project (HiRUC), a 3-year research project for volunteer drivers to experience what it would be like to pay for roads through a per-mile road usage charge. Participants' vehicle mileage will be calculated based on odometer readings collected during annual safety checks. Participants will then receive a driving report showing how many miles they drove in the past year, how much they may have paid in gas tax (based on the existing 16-cents-per gallon state fuel tax), and how much they might owe if the state were to collect a road user charge instead. For this state-initiated demonstration project, the HDOT plans to simply replace the gas tax (which is decreasing with more fuel efficient and electric vehicles are on road). It will not be used as a method to collect additional transportation funds.

- 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, transit service, and projects. Needs to be approved by the legislature or appropriate council.

- Public/private partnerships – An agreement between a private entity and a public agency to deliver transportation projects may be made, typically with greater involvement and risk taken by the private entity.

- Impact fees on new development/right-of-way donations – 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 the legislature to change the current laws that prohibit toll charges.

- Grant anticipation borrowing – This strategy allows public agencies to borrow against anticipated future federal and/or state revenues to fund capital projects that require large upfront expenditures. Existing programs include Grant Anticipation Revenue Vehicle (GARVEE) bonds for highways and Grant Anticipation Note (GAN) bonds for transit.

- State infrastructure banks and other revolving loan funds – These are lending organizations initially funded with federal grants, state funds, or both, 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 recognizes that 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.
- Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary Grants program – These are nationally competitive federal discretionary grants for investment in road, rail, transit, and ports to achieve national objectives. For fiscal year 2019, $900 million is available for National Infrastructure Investments.
- Infrastructure for Rebuilding America (INFRA) grants – Another nationally competitive discretionary grant to support FAST Act's commitment to fixing our nation's infrastructure.
- Community Development Block Grants – This program is administered through the U.S. Department of Housing and Urban Development and provides annual grants on a formula basis to promote affordable housing, provide services to community members, and create jobs through the expansion and retention of businesses.
- Safe Routes to School Grants – Since the passage of MAP-21, funding of safe routes to school has been administered differently, depending on the state. The HDOT administers a program called SafeRoutes, which includes education and small grant awards for both infrastructure and non-infrastructure projects.
- U.S. Department of Defense and Federal Emergency Management Agency funding – Some projects may be eligible for U.S. Department of Defense (DOD) or FEMA funding, depending on the project's ability to meet DOD or FEMA objectives (for example, preparedness grants).
- Transit Grants – Transit projects may be eligible for a variety of programs/grants funded through the Federal Transit Administration (both formula and discretionary funds).
- Transportation Impact Fees—Impact fees are assessed on developers, specifically crafted to cover transportation system upgrades associated with their proposed development.

## 5.4 Support Cross-Sector Planning and Policy Initiatives

To successfully implement this Plan, it is important to emphasize the continued need for coordination among planning efforts and for additional planning and policy initiatives.

As shown in Exhibit 5-2, Project Life Cycle, Planning is the first step in the project life cycle. Many of the goals, objectives, and solutions examined and ranked within this Plan originated within other planning efforts. Additionally, a large number of plans and studies across many sectors support transportation planning efforts, and vice versa. For example, land use planning efforts directly impact transportation planning needs, and planned transportation projects influence land use development plans.

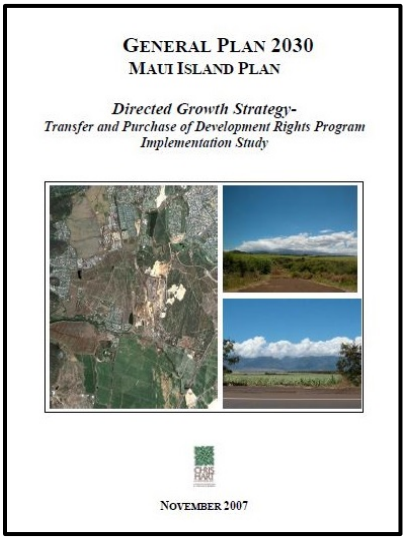
Part of the continued and successful implementation of this Plan will be the support of Cross-Sector Planning Initiatives.

- Kihei-Makena Community Plan—This plan provides specific recommendations to address the goals, objectives, and policies contained in the Maui General Plan, while recognizing the values and unique attributes of the Kihei-Makena area to enhance the region's overall living environment and long-term social, economic, environmental and land use needs. As the Kihei-Makena transportation system is a fundamental and critical component serving and placing limitations upon all these goals and objectives, transportation officials should play a large role in informing the plan as it is developed. Conversely, as the Community Plan is updated, new goals, objectives, and policies will require adaptations to the current transportation system and its planned solutions.


*South Kihei Road flooding April 2017*

In addition, many of the specialized planning and policy initiatives listed here could be considered in future updates of the Kihei-Makena Community Plan. As such, the Kihei-Makena Community Plan becomes a primary vehicle for formalizing new and revised plans and policies.

- Southwest Maui Watershed-Based Plan—The Southwest Maui Watershed Plan is an effort sponsored by the Central Maui Soil and Water Conservation District with the goal of developing a plan for improved water quality in the watersheds of South Maui. As the existing transportation system and the proposed solutions may have effects on water quality, it is recommended that implementers of this study strive for consistency with the recommended watershed protection and remediation strategies, as well as the 2016 Kihei Drainage Master Plan.
- Climate Change and Sea-Level Rise Adaptation Planning—Exhibit 3-22 illustrates the anticipated sea-level rise inundation areas within the study area based on projections and modeling by the University of Hawaii School of Ocean and Earth Science and Technology (UH-SOEST). Maui County's Hazard Mitigation Plan summarizes climate change considerations for hazard mitigation, while quantifying risk rankings and mitigation initiatives for thirteen types of hazard events. The University of Hawaii at Manoa Sea Grant College Program's 2014 report, Climate Change Impacts in Hawai'i, predicts a mean sea-level rise of 1 to 3 feet in Hawaii by year 2100, depending on continued global carbon dioxide emission rates.




Climate-change-induced hazards and sea-level rise will demand robust strategies and policies to mitigate impacts. Coastal retreat may eventually be warranted in some situations and locations, depending on the severity of impacts and the costs of other adaptation and mitigation measures. Further investments in transportation solutions should not be made without consideration of sea-level rise adaptation and mitigation strategies. Maui transportation plans, potential solutions, and projects should all be assessed for consistency with the goals, objectives, and mitigation strategies contained in Maui's Hazard Mitigation Plan.

It is also recommended that transportation agency officials and other Kihei transportation stakeholders consider engaging in focused climate change and hazard mitigation planning efforts for the district and integrate findings and mitigation strategies into current plans and those to be developed in the future.

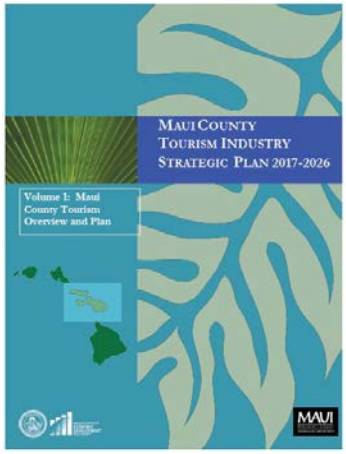
- Transfer of Development Rights (2030 General Plan)—Kihei and the County could benefit from the adoption of a transfer of development rights (TDR) program, which allows landowners to sell the rights to develop their land while other owners can purchase these rights to apply elsewhere. The County would be able to designate both sending and receiving zones, to enable the preservation of open space and agricultural lands and redirect development pressure into appropriate urbanized areas.

  Typically, in TDR programs throughout the nation, development rights are sold by owners of lands eligible for preservation via the conveyance of conservation easements. Developers in eligible urbanized areas are then able to purchase those rights and apply them to increase their allowable density or offset certain impact fees. TDR programs incentivize both conservation and intelligent development patterns. Lands that are critical to the health of the local environment and well-being of Maui citizens can be conserved without cost to the taxpayers. In terms of transportation systems and transportation planning, TDR programs enable targeted infrastructure investments, and

enhanced predictability and efficiency of land use patterns.

Maui County has studied the feasibility of implementing a TDR program as part of the 2030 General Plan, Maui Island Plan. (2007. *Directed Growth Strategy - Transfer and Purchase of Development Rights Program Implementation Study.)*

- Zoning and Policy Incentives—In addition to TDR programs, there are a host of other land use and zoning incentives that can be used to help guide growth in Kihei. Private developers can be incentivized to target specific regions, neighborhoods, and blocks for increased density, then transportation officials maximize investment strategies and systemwide efficiency. Many jurisdictions use a host of tools to guide and shape development, including the following:
  - Tiered Zoning Incentives—Are property owner incentives that offer increased Floor Area Ratios for certain types of projects in specific locations. Typically, local governments use tiered zoning in order to prevent sprawl and direct denser development into pre-planned the neighborhoods and nodes that can be more efficiently served by the surrounding infrastructure.
  - Local Improvement and Local Maintenance Districts—These generally allow a group of property owners to organize to request and participate in funding infrastructure upgrades and maintenance within their district.
  - Low-Impact Development and Green Infrastructure Strategies—Developers can be incentivized to include green infrastructure in their projects, typically for a reduction or elimination of certain impact fees. These development measures reduce infrastructure burdens placed on traditional governmental providers, most commonly in relation to stormwater management and watershed protections.
  - Right-of-Way Dedications and Sellbacks—Right-of-way dedication programs allow property owners to dedicate lands and easements required for infrastructure upgrades in exchange for reduced impact fees or zoning benefits; right-of-way sellback programs allow agencies to sellback excess right-of-way to help fund new projects and solutions.
- Maui Tourism Industry Policies and Initiatives—Given the importance of the Kihei transportation system to the continued successful function of the West Maui tourism industry, as well as the potential significant impacts on the transportation system of the West Maui tourism industry, it is recommended that key transportation sector members continue to collaborate with tourism industry stakeholders on key plans and initiatives.




- Private Land Use Planning Initiatives, State District Boundary Amendments, County Zone Change Applications, and Other Entitlement Applications—Involvement in other land use planning and entitlement processes will ensure that local transportation system issues and constraints are considered before deciding to allow further growth.

## 5.5 Performance Measures and Monitoring

Measuring the performance of the transportation system after projects are implemented is an important part of short-, mid- and long-range planning processes. Careful tracking of performance measures allows policymakers and transportation officials to evaluate the effectiveness of individual and systemwide solutions, along with being able to measure the degree to which other surrounding changes are impacting the transportation system's performance. It is recommended to measure results against both baseline conditions and predetermined set of performance goals or targets, in order to monitor progress and measure the value received from the investments made. This feedback is an important part of the decision-making process.

FAST Act and MAP-21 legislation supports performance and outcome-based state highway programs and provides a broad set of national transportation performance goals intended to help states invest their limited funds

efficiently. This Plan supports the national performance goals, as mentioned in Chapter 2, Goals and Objectives.

The performance measures are related to the evaluation criteria, and, therefore, consistent with the purpose of the Plan and its goals and objectives.

According to FHWA's Performance-Based Planning and Programming guidance, performance measures have five critical purposes:

1. **To clarify the definition of goals** - Performance measures are a tool that is used in converting broad goals into measurable objectives.
2. **To monitor or track performance over time** - Metrics are used to track performance on regular basis (such as yearly).
3. **As a reference for target setting** - Metrics are used as the basis for selecting a target that is intended to be achieved.
4. **As a basis for supporting policy and investment decisions by comparing alternative options** - Metrics are used as a basis for comparing alternative investments or policies in order to make decisions.
5. **To assess the effectiveness of projects and strategies** - Metrics are what enable measurement to assess whether projects and strategies have worked to further goals.

## 5.5.1 Performance Measures

The foundation for the performance measures selected as part of this Plan includes the Plan's purpose and the goals and objectives. The purpose of the Kihei Sub-area Transportation Plan is to develop transportation solutions to address mobility needs and congestion for all modes of transportation in the Kihei area and serve as a policy and implementation guide for improving Kihei's multimodal transportation system.

Past experience with other plans has shown that establishing too many performance measures means they will not be monitored, because they are too data-intensive or time-intensive and staff has limited time and resources. The Kihei Sub-area Transportation Plan includes a wide array of sample performance measures. It is expected that actual measures will be winnowed to a number that is small enough to monitor realistically yet provides meaningful assessment of plan implementation.

In addition, Maui MPO's 2019-2022 TIP report contains performance criteria for each individual project's anticipated contribution toward meeting goals. These are listed within the Project Information Sheets in Appendix E of the Maui MPO's *Transportation Improvement Program 2019-2022*.

> Tracking performance measures will enable implementers, stakeholders, and the public to gauge the effectiveness of solutions on an ongoing basis.

**Exhibit 5-10** provides a list of sample performance measures related to this Plan's goals and objectives that can be tracked and used to inform future implementation decisions.

**Exhibit 5-10. Kihei Sub-Area Transportation Plan Sample Performance Measures**

| Goals | Objectives | Sample Performance Measures |
|---|---|---|
| ***1. Safety*** Maintain a safe transportation system for users of all modes of travel and improve safety of the community | ▪ Maintain a safe transportation system for users of all land transportation modes<br>▪ Reduce the potential for conflicts between motorized and non-motorized modes of travel<br>▪ Address transportation safety through education and enforcement, as well as and engineering solutions<br>▪ Identify locations where there are elevated numbers of crashes<br>▪ Provide alternate or emergency access routes for communities in Kihei, especially in southern locations that are affected by limited roadways for ingress and egress<br>▪ Provide a transportation system that supports evacuation, response, and recovery for incidents | ▪ Number of traffic fatalities and serious injuries on all public roads (all modes) [a]<br>▪ Number of roadways or neighborhoods with only one possible evacuation route |

Exhibit 5-10. Kihei Sub-Area Transportation Plan Sample Performance Measures

| Goals | Objectives | Sample Performance Measures |
|---|---|---|
| **2.** ***Complete Streets*** Create a balanced, multimodal Complete Streets transportation network that provides options and access for motorized and Non-motorized modes of travel | ▪ Improve transportation facilities to support all modes of surface travel and create a systemwide network for ease of connection between transport modes<br>▪ Improve pedestrian and bicycle mobility, access, and connectivity throughout Kihei<br>▪ Encourage bike lanes and sidewalks on all new roadways, where appropriate<br>▪ Promote efficient travel between modes by improving connections and removing barriers | ▪ Percent of collector roads that have sidewalks or pedestrian facilities (compared to the total length of all collector roads in Kihei study area)<br>▪ Percent of collector roads that have bike lanes or bicycle facilities (compared to the total length of all collector roads in Kihei study area)<br>▪ Number of projects (or percentage of projects) that close a sidewalk or bike facility gap<br>▪ Number of projects (or percentage of projects) that incorporate non-motorized transportation facilities |
| **3.** ***System Preservation and Resiliency*** Maintain an efficient, complete, resilient transportation system for the long term | ▪ Plan and implement existing system improvements to effectively sustain the transportation system's safe, efficient, and complete operations<br>▪ Increase the resiliency of transportation facilities<br>▪ Provide a transportation system that is designed to appropriate storm events<br>▪ Promote transportation infrastructure recognizing the potential effect of sea level rise and extreme weather changes on transportation facilities | ▪ Percent of pavement in poor condition [a]<br>▪ Percentage of pavement in state of good repair [a]<br>▪ Percent of bridges (or bridge deck area) in poor condition [a]<br>▪ Percent of bridges (or bridge deck area) in state of good repair [a]<br>▪ Percent of transit assets in state of good repair<br>▪ Number of projects that provide an alternate route<br>▪ Reduction of lane miles/facilities prone to rain-flood events<br>▪ Reduction of lane miles/facilities prone to tidal flood events<br>▪ Reduction of lane miles/facilities at risk of sea-level rise impacts<br>▪ Number of flood control or storm drainage projects |
| **4.** **Regional Capacity and Mobility** Improve regional vehicular capacity and reduce congestion on roadways entering and exiting Kihei | ▪ Develop alternate routes to accommodate regional growth<br>▪ Consider a variety of intersection treatments to manage traffic flow to and from Piilani Highway | ▪ Percentage of person-miles traveled on Piilani Highway that are reliable [a]<br>▪ Average congested hours of weekday travel on Piilani Highway<br>▪ Average vehicle delay at intersections on Piilani Highway<br>▪ Lane miles of new roadway capacity (number of lanes, or miles of lanes providing access to/from new geographic areas)<br>▪ Queue lengths at intersections (locations where the queue decreases, or percent of locations where queues improve) |

Exhibit 5-10. Kihei Sub-Area Transportation Plan Sample Performance Measures

| Goals | Objectives | Sample Performance Measures |
|---|---|---|
| | | ▪ Lane-miles of new roadway providing local access (so vehicles can avoid using Piilani Highway for local trips) |
| **5. *Local Capacity and Congestion*** Improve local vehicular capacity and reduce congestion within Kihei | ▪ Complete north-south connections, *makai* of Piilani Highway, to improve the local roadway network and divert local trips from Piilani Highway<br>▪ Improve connector roads to provide alternate routes and access options<br>▪ Manage access between residential, hotel, and commercial zones along South Kihei Road | ▪ Average congested weekday hours on South Kihei Road<br>▪ Average vehicle delay at major local intersections along South Kihei Road or the North-South Collector Road (where specific intersections are identified)<br>▪ Lane miles of new roadway providing local access (so vehicles can avoid using Piilani Highway or South Kihei Road for local trips)<br>▪ Queue lengths at major intersections (locations where the queue decreases, or percent of locations where queues improve)<br>▪ Number of intersections with improved turn-lane capacity |
| **6. Transit** Develop a transit system that addresses the needs of residents and visitors and contributes to sustainable and livable communities | ▪ Improve public transit facilities by increasing users' comfort, convenience, and safety<br>▪ Improve or increase transit services<br>▪ Improve intermodal connections (such as transit, pedestrian, and bicycle connections) | ▪ Reduce the percentage of fixed-route buses that have met or exceeded their useful life<br>▪ Annual number of transit boarding in the Kihei study area<br>▪ Number of added transit routes to new service areas (or extent of expanded transit service area)<br>▪ Number of new transit runs on existing route (increased transit frequency)<br>▪ Number of new/improved public transit facilities, such as park-and-rides, bike racks, bus shelters<br>▪ Number of locations with/without sidewalk or pedestrian access |
| **7. Economic Vitality** Promote the expansion and diversification of Kihei's economy through the efficient and effective use of transportation facilities and amenities | ▪ Improve the movement of people, goods, and services through congestion relief and increased capacity<br>▪ Maintain and develop an integrated and reliable freight system or network by ensuring connectivity between local roadways and regional roadways<br>▪ Allow for efficient servicing of businesses, including deliveries and access to back-of-house areas<br>▪ Promote integration of transportation facilities and information systems for efficient movement for business and leisure purposes | ▪ Truck travel time reliability on Piilani Highway [a]<br>▪ Percentage of person-miles traveled on Piilani Highway that are reliable [a]<br>▪ Average congested hours of weekday travel on Piilani Highway<br>▪ Average vehicle delay at intersections on Piilani Highway or South Kihei Road (where specific intersections are identified)<br>▪ Lane miles of new roadway capacity (number of lanes, or miles of lanes |

Exhibit 5-10. Kihei Sub-Area Transportation Plan Sample Performance Measures

| Goals | Objectives | Sample Performance Measures |
|---|---|---|
| | | providing access to/from new geographic areas)<br>▪ Increase methods or ways to provide real travel time information to the public |
| ***8. Cost*** Obtain sufficient transportation funding | ▪ Minimize project costs<br>▪ Explore other funding alternatives | ▪ Total dollars invested in transportation projects per year in the Plan area |
| **9. Right-of-way** Minimize impacts to right-of-way | ▪ Develop improvements to minimize the amount of right-of-way take<br>▪ Identify improvements that can be implemented on existing right-of-way under the jurisdiction of Maui County, HDOT, or project partners<br>▪ Investigate land swaps with other government agencies to acquire right-of-way | ▪ Annual measure (in acres or square feet) of right-of-way acquisitions |
| ***10. Land Use*** Develop transportation system projects that support the land uses in the study area | ▪ Provide transportation facilities that complement the neighboring land use<br>▪ Identify the appropriate functional classification of the roadways and design features<br>▪ Plan and design access management treatments to appropriately and adequately support adjacent land uses | ▪ Percentage of redevelopment occurring as infill development where the infrastructure exists<br>▪ Number or percentage of developments (e.g., building permits) that incorporate Smart Growth policies<br>▪ Number or percentage of developments that incorporate transit oriented components<br>▪ Percentage of driveway or roadway access to major collectors and Piilani Highway |
| **11. Natural Environment** Preserve and enhance the natural environment | ▪ Minimize and reduce environmental impacts, including physical, biological, and aesthetic resources<br>▪ Minimize impacts to wetlands, shoreline, streams, and environmentally sensitive areas<br>▪ Provide transportation facilities that complement the natural environment and enhance quality of life<br>▪ Promote the use of sustainable practices in planning, designing, constructing, and maintaining transportation facilities and programs | ▪ Number of projects that incorporate non-motorized transportation facilities<br>▪ Number of projects that incorporate design modifications/retrofits to avoid, minimize, or mitigate any impact to the natural environment |
| **12. Cultural Resources** Preserve cultural resources | ▪ Avoid, minimize, and provide reasonable measures to mitigate degradation of cultural resources and the environment caused by transportation facilities and operations | ▪ Address cultural resource objectives during project development phase in consultation with stakeholders |
| ***13. Accessibility*** Improve the transportation system for people of varying abilities | ▪ Improve the ease with which persons with impaired abilities can reach goods, services, activities, and destinations<br>▪ Provide access for persons with disabilities whenever a pedestrian way is newly built or altered | ▪ Percent of Americans with Disabilities Act-compliant transportation facilities<br>▪ Transit ridership for persons with disabilities (fixed route buses)<br>▪ Number of audible traffic signals |

Exhibit 5-10. Kihei Sub-Area Transportation Plan Sample Performance Measures

| Goals | Objectives | Sample Performance Measures |
|---|---|---|
| | | ▪ Miles of accessible routes on collector roadways |
| **14. Equity** Ensure the fair treatment and meaningful involvement of all populations | ▪ Seek out and consider the needs of the transportation-disadvantaged<br>▪ Avoid or minimize disproportionately high and adverse human health and environmental effects, including social and economic effects on minority and low-income populations<br>▪ Provide equitable levels of transportation and transit services and benefits to minority and low-income populations | ▪ Percentage of annual funding spent on improving transportation facilities serving moderate- and low-income residents<br>▪ Infill development in economically disinvested areas |

Notes:

Group A goals are ***bolded and italicized***, with their rows shaded; Group B goals are **bolded** and are unshaded.

[a] Federal performance measures under MAP-21

# 5.6 Plan Summary and Conclusions

The Kihei Sub-area Transportation Plan, the successor to the Kihei Traffic Master Plan completed in 1996 and updated in 2005, provides a comprehensive examination of the area's transportation needs and potential solutions. A striking difference between this Plan and the previous document is the earlier emphasis on traffic volumes, traffic forecasts, and operating conditions. Transportation today is multi-faceted and multimodal, a shift that has been largely influenced by input from the people who use transportation infrastructure and services.

Exhibit 5-11 summarizes key facets of the existing Kihei transportation system and how the Plan addresses problems and opportunities.

Exhibit 5-11. Kihei Sub-Area Transportation Plan Additions and Improvements to the Existing Transportation System

| Existing Conditions | Plan Response |
|---|---|
| Kihei has a relatively well-developed transportation grid with a clear hierarchy of roadways. | Continuity of the North-South Collector is a key missing component of the existing transportation network. Investment in effectively completing the grid will improve congestion, mobility, and emergency egress. |
| Safe multimodal access is important to the community; progress in this area is evident in flashing crosswalk beacons and speed bumps that have been installed in recent years and in requirements for new development to accommodate pedestrians and bicyclists. | The Plan calls attention to opportunities to retrofit the transportation network by identifying gaps in sidewalks and bicycle facilities and intersections where improvements are desired. |
| Land use development in Kihei features a strongly linear pattern along the coastline, but clustered development is also notable, including the informal town center on South Kihei Road between Piikea Avenue and Lipoa Street (comprising Azeka Shopping Center, Times Supermarket, and Lipoa Center), the community facilities and recreational hub (comprising Kihei Community Center, Kihei Elementary and Lokelani Intermediate Schools, and Kihei District Park and Gym), and employment centers, such as the Maui Research and Technology Park. | Aggregating compatible land uses creates densities and shorter distances that make it more convenient for people to walk and bicycle. At the same time, these areas can become highly congested. The Plan proposes solutions to make travel in and around development nodes both more attractive for further infill development, while enabling better circulation. |
| There is a tendency to view Kihei from a north-south perspective given the prominence of South Kihei Road, Piilani Highway, and the North-South Collector; however, *mauka-makai* connections are also integral to a functional transportation network. | The Plan includes solutions to improve *mauka-makai* streets that link *mauka* areas to *makai* resources such, as jobs, shops, community facilities, and bus routes. |

Exhibit 5-11. Kihei Sub-Area Transportation Plan Additions and Improvements to the Existing Transportation System

| Existing Conditions | Plan Response |
|---|---|
| Bus transit provides options for how people travel and offers transportation services for a broad cross-section of the community, including those who cannot drive or afford a motor vehicle. Current fixed-route service focuses on core circulatory routes that connect popular Kihei destinations. | Recommendations from the Maui Short Range Transit Plan, 2017-2022, have been incorporated in the Plan to further improve service based on changing community needs. |
| Long-term growth is planned for *mauka* lands up to the *mauka* growth boundary. | The Plan acknowledges the need to support future urban development by including a conceptual alignment for a new high-capacity roadway. Also included in the plan is a potential highway to connect the Kihei and Upcountry communities. |
| The Kihei transportation area encompasses several watersheds and major drainageways. Heavy *mauka* rains can result in flooding downslope in Kihei despite its typically dry climate. | The County has completed a separate Kihei Drainage Master Plan that proposes improvements by watershed. Where improvements are expected to affect roadways, such as by correcting known flooding and ponding issues that can disrupt traffic flow and by reducing potential washouts, they have been included in the Plan. |
| The total estimated cost of transportation proposals far exceeds anticipated funds through the planning horizon of 2035, where public funds for transportation improvements are diminishing and there are competing needs across Maui County. | To assist the County in prioritizing improvement projects with limited funds, the Plan was based on a systematic process of evaluating proposals against criteria developed from community-based goals and objectives. The outcome is not a prescribed list of projects to be implemented in ranked order, but a list of projects that reflect how well they meet Kihei's transportation goals. The projects are further grouped into three cost categories and can be selected for more detailed planning and development as funds become available. |
| Continued community and stakeholder involvement will be needed as specific projects enter the delivery pipeline. | The County is also exploring reasonable options to measure and monitor progress. As transportation improvements come on line and as transportation policy decisions are made, the County will have to determine how the needle is moving toward meeting transportation goals and objectives in Kihei. |

Chapter 6

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# Appendix A
# Review of Plans and Policies

KIHEI SUB-AREA
TRANSPORTATION PLAN

KIHEI

TECHNICAL MEMORANDUM

# Kihei Sub-Area Transportation Study

# Plan and Policy Review

PREPARED FOR: County of Maui

DATE: May 2018; updated March 2020

## Introduction

The project team reviewed previous studies, plans, and policies relevant to the Kihei Sub-Area Transportation Study (Project). The objective of the Project is to improve mobility of all modes of transportation through proposed improvements (also called potential solutions). This memorandum summarizes the findings, which include transportation resources and multimodal needs within the project area, and deficiencies related to safety, system management, local and regional connectivity, and access.

This summary of previous studies, plans and policies is an important first step to ensure that the Project will be building effectively on previously adopted plans and policies and will be compliant with regional and local requirements. The following plans and policies were reviewed:

1. *Federal Aid Highways 2035 Transportation Plan for the District of Maui*, State of Hawaii Department of Transportation (HDOT), July 2014
2. Federal Aid and State Highway System Updated System Identification and Functional Classification, HDOT, December 2012
3. *Bike Plan Hawaii*, HDOT, 2003
4. *Statewide Pedestrian Master Plan*, HDOT, May 2013
5. *Kihei Traffic Master Plan*, County of Maui, October 1996
6. Act 54, May 2009; HRS §264-20.5 Complete Streets, State of Hawaii and Complete Streets Policy Resolution, County of Maui, April 2012
7. *Countywide Policy Plan*, County of Maui, March 2010
8. *Maui Island Plan General Plan 2030*, County of Maui, December 2012
9. *Kihei-Makena Community Plan*, County of Maui, 1998
10. *South Maui Region Parks and Open Space Master Plan*, County of Maui, October 2003
11. *Kihei Drainage Master Plan, Waiakoa Gulch to Kilohana Drive (Pre Final)*, County of Maui, November 2016
12. *Maui Short Range Transit Plan*, County of Maui Department of Transportation, April 2016

# 1. Federal-Aid Highways 2035 Transportation Plan for the District of Maui, HDOT, July 2014

## Purpose and Content

The *Federal-Aid Highways 2035 Transportation Plan for the District of Maui* (Federal-Aid Plan) is a long-range plan that provides a foundation for addressing Maui's land transportation needs and achieving its future transportation goals. The *Federal-Aid Plan* provides guidance on land transportation decisions for the federal-aid highways on Maui through 2035, and sets the direction for prioritizing land transportation system improvements.

With recent federal legislation placing an emphasis on highway system preservation and infrastructure maintenance, the *Federal-Aid Plan* draws upon community input and extensive public involvement to allocate limited available funding to appropriately address future anticipated transportation needs comprehensively.

## Findings Related to the Project

The *Federal-Aid Plan* goals and objectives that are relevant to the Project are listed below:

**Environment and Sustainability**

Goal 1.1 Preserve and enhance the natural environment, including biological and aesthetic resources

Goal 1.2 Preserve and enhance Hawaii's cultural resources environment. Including archaeological and historical sites

Goal 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 impact of climate change on the transportation system

**Modal Integration**

Goal 2.1 Provide a Complete Streets transportation system of motorized and nonmotorized options

Goal 2.2 Promote efficient travel between modes by creating connections and removing barriers

Goal 2.3 Promote safe connections between modal alternatives

**System Preservation**

Goal 3.1 Manage transportation assets and optimize investments

Goal 3.2 Maintain a safe, efficient, complete transportation systems for the long term

**Security**

Goal 4.2 Plan, maintain and operate a transportation system that supports evacuation, response and recovery for incidents

Goal 4.2 Improve resiliency of the state through the transportation system

**Economic Vitality**

Goal 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

**System Efficiency Management and Operations**

Goal 6.1 Improve capacity and efficiency, and reduce congestion within the existing transportation system for long-term benefit

**Transportation Access Mobility**

Goal 7.1 Provide appropriate and reliable transportation access options statewide to all users

**Safety**

Goal 8.1 Maintain a safe transportation system for all land transportation modes

Goal 8.2 Improve safety of the community through connectivity of the transportation infrastructure

## Application to this Project

### To Develop Project Goals and Objectives:

The goals and objectives of the Project will be aligned with the goals of the *Federal-Aid Plan*, and will build upon *Federal-Aid Plan* discussions with stakeholders and the community. These discussions revealed important goals for Maui's transportation system including those related to safety, modal integration, system efficiency and congestion relief, and the environment and sustainability.

### To Develop Potential Project Solutions:

The development of Project alternatives and solutions will take the *Federal-Aid Plan* project list into consideration, so as to not duplicate efforts. Potential solutions will also be developed and prioritized in light of consistency with the important goals and objectives of the *Federal-Aid Plan*.

# 2. Federal-Aid and State Highway System Update: System Identification and Functional Classification, HDOT, December 2012

## Purpose and Content

The Federal-Aid and State Highway System Update provides guidance to determine the functional classification of roadways. Functional classification is a framework for identifying a particular roadway's role in moving vehicles. The classification carries with it expectations about roadway design, including speed, capacity, and relationship to existing and future land use development. Functional classification is determined by a number of different criteria, such as travel generators, route feasibility, traffic characteristics, spacing, and capacity. Updating the classifications for roadways is essential because the use and function of roads change over time.

## Findings Related to the Project

Functional classifications are used throughout the life cycle of roadways—from planning and design, to programming and budgeting capital improvements, to fiscal management for roadway operations and maintenance. For the Project, functional classification will be considered when evaluating the overall roadway network and recommending future transportation solutions. Roadways in Kihei include urban principal arterials, urban major collectors, and urban minor collectors. Many County roads changed their functional classification based upon the new policies and procedures set by this document.

## Application to this Project

### To Develop Project Goals and Objectives:

The goals and objectives of the Project will be consistent with the guidance and policies described in the Federal Aid and State Highway System Update: System Identification and Functional Classification.

### To Develop Potential Project Solutions:

Functional classification is based on the character of intended service or the function of roadways. Project solutions will be developed and prioritized with consideration of the roadway functional classification.

# 3. Bike Plan Hawaii, HDOT, 2003

## Purpose and Content

*Bike Plan Hawaii* is a tool to integrate bicycling into the state's transportation system. It outlines how the state intends to accommodate and promote bicycling, and draws on a combination of existing and future bicycle facilities, policies, and programs to ensure a successful bicycle network. The purpose of *Bike Plan Hawaii* 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 Project

The goal of *Bike Plan Hawaii* is to "establish bicycling as a safe and convenient mode of transportation for residents and visitors throughout the state," through engineering and planning objectives such as new roadway facilities that accommodate bicycles and land use plans/regulations that promote bicycle use. *Bike Plan Hawaii* defines four different types of bicycle facilities:

- Shared Roadways - any street or highway that is open to both bicycle and motor vehicle travel, but has no special signage for bicyclists.
- Signed Shared Roadways - any street or highway that is open to both bicycle and motor vehicle travel, and has special signage designating it as a preferred route for bicycle use.
- Bike Lane - a section of road that is designated by striping, signing, or pavement markings for the preferential or exclusive use by bicyclists.
- Shared Use Path - a bikeway that is physically separated from motor vehicle traffic by an open space or barrier, and may be used by pedestrians and other non-motorized users.

Existing facilities within Kihei include a signed shared roadway along Piilani Highway, bike lanes along South Kihei Road and several other County roads, and the Kihei Greenway shared use path adjacent to Liloa Drive.

Future proposed facilities are noted in Appendix G of the *Bike Plan Hawaii* including some that have been implemented since the plan was completed. Other proposed facilities include extending or creating new signed shared roads, bike lanes, and shared use paths.

## Application to this Project

### To Develop Project Goals and Objectives:

The goals of the Project will align with the purpose of *Bike Plan Hawaii* and will consider providing bicycle and non-motorized accommodations on existing and potential new roadways.

### To Develop Potential Project Solutions:

The potential solutions will consider the proposed facilities included in Appendix G of *Bike Plan Hawaii*. Analyses will be conducted to confirm the bicycle facility inventory and assess the need and feasibility for future facilities on state and county roadways within the Kihei Sub-Area project area.

# 4. Statewide Pedestrian Master Plan, HDOT, May 2013

## Purpose and Content

The *Statewide Pedestrian Master Plan* is a comprehensive effort that focuses on improving pedestrian safety statewide and evaluates ways to enhance pedestrian mobility and accessibility. It identifies the most critical needs of the statewide pedestrian system (including safety improvements or repairs), prioritizes projects and programs to address the needs, and provides strategies to implement the recommendations.

## Findings Related to the Project

The *Pedestrian Master Plan* goals and objectives that are relevant to the Project are listed below:

Goal 1 – Improve pedestrian mobility and accessibility

- Objectives: Increase pedestrian activity, implement projects along state highways to enhance mobility and accessibility, improve maintenance of pedestrian facilities.

Goal 2 – Improve pedestrian safety

- Objectives: Reduce the number of crashes and fatalities involving pedestrians.

Goal 3 – Improve connectivity of the pedestrian network

- Objectives: Support development of seamless and continuous pedestrian networks along state highways with connections to paths, walkways, trails, and other pedestrian facilities, encourage pedestrian connectivity across jurisdictions, and support Safe Routes to School programs to encourage more students to walk to and from school.

Goal 4 – Promote environmental benefits of walking

- Objectives: Reduce overall vehicle miles traveled through increased pedestrian trips, increase the use of other modes of transportation that reduce the use of fossil fuels, integrate pedestrian facility design with the natural environment to the greatest extent possible.

Goal 7 – Promote and support walking as an important transportation mode that reduces overall energy use

- Objectives: Increase the use of other modes of transportation that reduce the use of fossil fuels, reduce resident and visitor motor vehicle fuel demand to help meet 2030 targets for energy efficiency.

## Application to this Project

### To Develop Project Goals and Objectives:

The goals and objectives of the Project will be consistent with the goals of the *Pedestrian Master Plan*.

### To Develop Potential Project Solutions:

The potential solutions will be developed and prioritized with consideration given to pedestrian needs and the goals of the *Pedestrian Master Plan*. The proposed recommendations of the *Pedestrian Master Plan* will also be reviewed and considered for the Project.

# 5. Kihei Traffic Master Plan, October 1996

## Purpose and Content

In March 1996, the County of Maui and State Department of Transportation cooperated in preparing the County of Maui Long-Range Land Transportation Plan. While developing the work program for the Maui Island component, it was determined that the Kihei community was in need of short-term traffic solutions that could be implemented within a shorter time frame. The *Kihei Traffic Master Plan* was the outcome of the effort for more localized transportation planning. While the long-range plan developed a highway improvement program to the year 2020, the *Kihei Traffic Master Plan* focused on improving the local street system over a 10-year period, based on traffic forecasts for the year 2005.

## Findings Related to the Project

The *Kihei Traffic Master Plan* included 9 proposals that were categorized as long-range improvements. Additionally, to address internal circulation problems, the short-range improvement program included proposals for key intersections. The Plan recommended signalizing 10 intersections on South Kihei Road and 5 intersections on Piilani Highway. Three intersections on Piilani Highway were recommended to remain unsignalized with access limited to right turns in from the highway and right turns out onto the highway.

| **Signalize the Following Intersections on South Kihei Road** | **Signalize the Following Intersections on Piilani Highway** | **Access to Piilani Highway Limited to Right Turns in/Right Turns Out** |
|---|---|---|
| Uwapo Road | Kaonoulu Street | ✓ Kulanihakoi Street |
| Ohukai Road | Waipulani Road | Kanani Road (signalized) |
| Kaonoulu Street | Welakahao Road | ✓ Keonekai Road |
| Kulanihakoi Road | ✓ Road “F” (Alanui Ke Alii) | |
| ✓ Road “C” (Piikea Avenue)<br>To be done in conjunction with removal of the signal at the McDonalds and Azeka Place driveways | ✓ Kilohana Drive | |
| ✓ Welakahao Road | | |
| Kanani Road | | |
| ✓ Road “F” (Alanui Ke Alii) | | |
| Keonekai Road | | |
| Piilani Highway | | |

## Application to this Project

### To Develop Project Goals and Objectives:

The Project's goals and objectives would consider the *Kihei Traffic Master Plan* as a foundational document guiding the evolution of the region's roadway network.

### To Develop Potential Project Solutions:

The potential solutions will revisit the long- and short-range recommendations in the master plan. Traffic analyses will be performed using current and projected volumes to evaluate whether proposals in the 1998 plan—not yet implemented—are necessary and appropriate.

# 6. Act 54, May 2009; HRS §264-20.5 Complete Streets; and Complete Streets Policy Resolution, County of Maui, April 2012

## Purpose and Content

The Complete Streets policy documents serve as a framework for implementing the concept of "complete streets" throughout Hawaii to better serve all transportation users. The policy is based on direction from local task force efforts, guidance from complete streets best practices across the country, and the provisions of Act 54 and HRS §264-20.5. Act 54 requires that the Hawaii Department of Transportation and the counties within the state adopt a Complete Streets Policy. As a result, the Maui County Council adopted a county-level Complete Street Policy to promote safe access, encourage multiple travel modes, integrate travel modes, encourage healthy lifestyles, and provide a complete and connected network for pedestrians, bicyclists, motorists, and public transportation.

Adoption of a Complete Streets Policy is intended to provide a comprehensive approach to planning and design of roadway facilities, and to improve the quality of life, roadway safety, and mobility for all travelers.

## Findings Related to the Project

Relevant principles of the state's Complete Streets Policy are:

- 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 [CSS]) – 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.

- 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.

At the County-level, the Complete Streets Policy 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. Priority shall also be given to pedestrian travel in town centers and other densely populated areas for any new County transportation improvement projects.

## Application to this Project

### To Develop Project Goals and Objectives:

The Project goals and objectives will align with the Complete Streets Policy and be consistent with the relevant principles.

### To Develop Potential Project Solutions:

Potential Project solutions will be consistent with the Complete Streets Policy and principles.

# 7. Countywide Policy Plan, March 2010

## Purpose and Content

The *Countywide Policy Plan (Policy Plan)* provides broad policies that establish the desired direction for the County's future to the year 2030. It is intended to provide a framework for updating the *Maui Island Plan* and the nine *Community Plans*. The document looks back at the historical development of Maui County, assesses current conditions across a wide spectrum of resources and trends, then looks ahead with a set of core themes representing the preferred future of the community.

## Findings Related to the Project

The *Policy Plan* was developed through a comprehensive public participation program and utilized several formats to maximize outreach. As a consensus document, the plan reflects the input and contributions of citizens across the county, including those who live, work, and recreate in Kihei.

The *Policy Plan* articulates a vision at the County level as follows:

- Maui County will be an innovative model of sustainable island living and a place where every individual can grow to reach his or her potential.
- The needs of each individual, the needs of the whole community, and the needs of our natural and cultural assets will be brought into balance to reflect the high value we place on both our natural environment and our people.
- The education and health of our people will be fostered to ensure that the residents of these islands can, if they choose, spend their whole lives here—raising children, owning homes, enjoying rewarding jobs, and taking advantages of opportunities to contribute to this community and to be good stewards of our local treasures and resources.
- Maui County will be a leader in the creation of responsible, self-sufficient communities and environmentally sound economic development and land stewardship.
- That which makes Maui County unique in the world will be preserved, celebrated and protected for generations to come.

In the discussion of current transportation issues, the *Policy Plan* noted the presence of congestion "pinch points" in some locations, and the need to utilize traffic modeling tools to anticipate the need for future transportation infrastructure and improve the link between costs and sources of traffic growth. The presence or lack of pedestrian and bicycle facilities was seen as having a large impact on the quality of life for residents, especially children, seniors and those who don't drive. Developing and extending non-motorized facilities was identified as opportunities. Similarly, public transit was seen as having a positive future in Maui as the system becomes more convenient and efficient.

The *Policy Plan* sets forth 11 core themes to accomplish the vision. While most of the themes are related to transportation in some way, the following theme is most closely aligned:

**Diversify Transportation Options**: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.

This goal is supported by five objectives, of which three pertain to land transportation. Each objective is associated with policies and implementing actions.

- Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable.
- Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation.
- Improve and expand the planning and management of transportation systems.

## Application to this Project

### To Develop Project Goals and Objectives:

This Project is part of a continuum of community-based planning from the *Countywide Policy Plan* down to a *Sub-Area Transportation Plan* that proposes specific transportation solutions at the local level. As such, it is important for this Project to coordinate with the vision, goals, and policies of the overarching *Policy Plan*.

### To Develop Potential Project Solutions:

The *Policy Plan* is one of several documents that will provide guideposts for developing and evaluating transportation solutions.

# 8. Maui Island Plan General Plan 2030, County of Maui, December 2012

## Purpose and Content

The *Maui Island Plan* establishes a directed growth strategy for the Island of Maui through the identification of seven community 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 County's General Plan program. 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 Project

The *Maui 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.

Policies related to the island's highway system includes:

- Plan for an integrated multi-modal transportation system comprised of public transit, bicycle, pedestrian, automobile, and other transportation modes
- Refocus transportation investment from the construction of additional roadways only for the automobile to the expansion of a multimodal transportation system
- Encourage the use of "complete streets" design methods
- Ensure that roadways and transit systems in rural areas and small towns enhance community character

Policies related to the transit system includes:

- Ensure transit-, roadway-, and pedestrian-facilities design and level-of-service standards respect the unique character of our communities
- Require new development, where appropriate, to integrate sidewalks, pathways, bikeways, and transit infrastructure into new commercial and residential projects while enhancing community character
- Consider identification, acquisition where appropriate, and utilization of abandoned rights-of-way for bikeways, pedestrian pathways, and open-space networks

## Application to this Project

### To Develop Project Goals and Objectives:

The goals and objectives of the Project will be consistent with the guidance and policies described in the *Maui Island Plan.* Evaluation criteria developed for the Project will consider the policies, implementing actions, and strategies identified in the *Maui Island Plan*.

### To Develop Potential Project Solutions:

Project solutions will be developed and prioritized with consideration of *Maui Island Plan* policy direction and as well as direction regarding land use, development, and character of the island.

# 9. Kihei-Makena Community Plan, 1998

## Purpose and Content

The *Kihei-Makena Community Plan* is one of nine community plans for Maui County. At the time of adoption, it reflected current and anticipated conditions in the Kihei-Makena region and advanced planning goals, objectives, polices, and implementation considerations to guide decision-making in the region.

The *Kihei-Makena Community Plan* is intended to provide specific recommendations to address the goals, objectives and policies contained in the General Plan, while recognizing the values and unique attributes of the Kihei-Makena area in order to enhance the region's overall living environment.

The Planning Department will be initiating the process to update the Plan in the near future.

## Findings Related to the Project

The *Kihei-Makena Community Plan* was founded on three basic planning themes:

- Provision of needed public facilities and infrastructure
- Preservation and enhancement of significant natural resources
- Enhancement of neighborhoods

Related to the first theme, transportation was identified as one of the region's major problems, with inadequate traffic circulation and the lack of public transportation. More specifically, the plan raised the following issues:

- Reliance on South Kihei Road and Piilani Highway; alternative travel routes desired for short trips within the community
- Dependence on automobiles resulting, in part, from the distribution of land uses
- Opportunities for bicycle and pedestrian paths can provide an effective alternative to automobile use
- Consideration needed for mass transit and public transportation
- Relative lack of mobility among youth and elderly

Transportation-related goals and objectives may be found within several elements of the *Kihei-Makena Community Plan*, as listed below:

**Land Use**

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.

> Objective E: Establish a system of parks, utility easements, shoreline areas, drainage ways 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.

**Environment**

Goal: Preservation, protection, and enhancement of Kihei-Makena's unique and fragile environmental resources.

> Objective G: Require the integration of wetlands and drainage ways into an open space, pedestrian pathway, and bikeway system within and around the Lipoa business district.

**Economic Activity**

Goal: A diversified and stable economic base which serves resident and visitor needs while providing long-term resident employment.

> Objective A: Establish a sustainable rate of economic development consistent with concurrent provision of needed transportation, utilities, and public facilities improvements.

**Physical and Social Infrastructure**

Goal: Provision of facility systems, public services and capital improvement projects in an efficient, reliable, cost effective, and environmentally sensitive manner which accommodates the needs of the

Kihei-Makena community, and fully support present and planned land uses, especially in the case of project district implementation.

Transportation Objectives and Policies (relevant to the Project area)

a. 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. Roadway improvements should be planned, designed, and constructed as prioritized under the Implementing Actions section below, and as generally described in the Kihei Traffic Master Plan.

b. 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.

c. 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.

d. Support ridesharing, bicycle and pedestrian use, alternative work schedules, traffic signal synchronization, and/or other transportation demand management strategies.

e. 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.

g. Plan, design, and construct a pedestrian and bikeway network throughout the Kihei-Makena region which considers the utilization of existing stream beds, drainage ways, wetlands and public rights-of-way along coastal and inland areas.

h. Encourage joint public/private participation in the planning, design and construction of roadway improvements, especially those identified in this plan.

Transportation Implementing Actions (relevant to the Project area)

a. Plan, design and construct a new Road “C,” from South Kihei Road to Piilani Highway, to provide an alternative connector roadway in Central Kihei, as described in the Kihei Traffic Master Plan. Said alignment shall extend in an easterly direction from its existing segment at South Kihei Road and link with Piilani Highway. This is the highest priority for roadway improvements in the community plan region.

b. Plan, design and construct appropriate sections of a new North-South Collector Road, from Uwapo Road to Keonekai Road, to facilitate improved traffic movement in Kihei proper. When selecting a specific alignment, impacting existing structures should be kept to a minimum. Consideration should be given to segments between Kaonoulu Street and Auhana Street, as well as between Ke Alii Alanui and Keonekai Road. In terms of roadway improvements within the community plan region, this shall be the second priority.

c. Widen Piilani Highway, between Mokulele Highway and Wailea Ike Drive to four lanes. In terms of roadway improvements with the community plan region, this shall be the third priority.

d. Plan, design and construct a new Road “B,” from South Kihei Road to the new North-South Collector Road, to improve internal circulation in the Central Kihei area.

e. Plan, design, and construct a new Road “A,” from “Road “B” to Lipoa Street, to provide increased circulation in the Lipoa business area.

f. Provide clear signage with adequate lighting along Piilani Highway to indicate Kihei access points. Also provide a landscape buffer and bikepath on both sides of Piilani Highway.

g. Provide left turn storage lanes and acceleration/deceleration lanes on Piilani Highway, and at traffic signals at important intersections along South Kihei Road.

i. Preserve and enhance the identity of Kihei's neighborhoods by designing the north-south collector road in discontinuous segments. Work with landowners, neighborhoods, and community groups to plan and implement an adjacent but separate trail/greenway/bikepath to provide non-motorized public access along the full length of the road reserve. In sections where no roadway is built, the trail/greenway/bikepath may be broadened to form a neighborhood park, public access, or open space area.

## Applications to this Project

### To Develop Project Goals and Objectives:

The goals and objectives of the Project will be consistent with the goals of the *Kihei-Makena Community Plan*.

### To Develop Potential Project Solutions:

Project solutions will be developed and prioritized with consideration for the implementing actions identified in the *Kihei-Makena Community Plan*. The Project will incorporate transportation facilities constructed during the intervening years, and changes in urban development to forecast future traffic volumes and assess future traffic conditions.

# 10. South Maui Region Parks and Open Space Master Plan, October 2003

## Purpose and Content

The *Parks and Open Space Master Plan (Parks Plan)* was developed as a tool for guiding the enhancement and expansion of parks and open space in the South Maui Region, one of the administrative units within the County of Maui Department of Parks and Recreation. The *Parks Plan* provides an overview of existing park facilities and conducts a needs assessment, examines parks and open space from a network perspective, and provides a development plan for Kihei Community Park.

## Findings Related to the Project

Of particular relevance to the Project is the complementarity between non-motorized modes of travel (in transportation language) and linear parks, trails, and greenways (in parks language). The vision for the *Parks Plan* is based on Objective E of the Land Use Policy in the 1998 *Kihei-Makena Community Plan*:

> Establish a system of parks, utility easements, shoreline areas, drainage ways and wetlands as an open space framework for the urban areas of the region…and provide an integrated system of pedestrian and bicycle paths.

The vision is further elaborated in the goal statement, a portion of which is as follows:

> The publicly endorsed parks and open space vision for South Maui…is…to share a common system of parks and open space areas connected by bicycle and pedestrian corridors… Bicycle and pedestrian corridors should link the parks and open spaces together with a contiguous system of trails and designated pathways.

Among the implementing actions were proposed routes and priorities.

| Priority Route | Sub-Priority Route |
|---|---|
| 1. North-South Collector or Lipoa Greenway, as the main axis for the Kihei trail system | 1. Makai-side of Liloa Street from East Lipoa Street to Welakahao Street (opposite the proposed Kihei Community Park)<br>2. Across the top of the Maui Kamaole, Maui Hill, Keawekapu View, and Kilohana Mauka subdivisions<br>3. From Kaonoulu Street to Auhana Road |
| 2. Coastal Heritage Trail, connecting various State- and County-owned coastal lands from the old Kihei Pier to the Makana Kai Hotel in a continuous waterfront pedestrian corridor | 1. Memorial (Mai Poina Oe Iau) Park to West Lipoa Street<br>2. Halamua Street to Cove Park |
| 3. East-West Connectors from the coastline to Piilani Highway | 1. Drainage way that runs through the new Kaonoulu Village<br>2. Connection along the old Kapu Road, mauka of South Kihei Road that connects Lokelani School and Kihei Elementary via the two wetlands in the area, to the State reservoir (next to St. Theresa's Church)<br>3. Open space drainage way makai of the new Kihei Community Park that runs east-west from the new park site to South Kihei Road |

## Applications to this Project

### To Develop Project Goals and Objectives:

While the Project is primarily concerned with transportation goals and objectives, the *Parks Plan* draws attention to the fact that people use transportation facilities for many purposes and their travel expectations are highly variable. The *Parks Plan* is an illustration that off-road facilities (paths and trails) involve traditional transportation goals, such as connectivity, mobility and safety, but also an expanded set of metrics that include comfort, aesthetics, and proximity to natural and cultural resources. Understanding these variances will help to hone and focus the goals and objectives of the Project.

### To Develop Potential Project Solutions:

The lines between transportation and recreation have blurred in recent years with the adoption of Complete Streets policies and increased public interest in reducing motor vehicle use for reasons of environmental sustainability and health and fitness. The pool of potential Project solutions could be expanded by flexible thinking about multi-use facilities and alternative routing schemes (where non-motorized travel corridors are narrower than roadways). Overlapping agency interests suggest opportunities to leverage resources and deliver projects in innovative ways.

# 11. Kihei Drainage Master Plan, Waiakoa Gulch to Kilohana Drive (Pre-Final), November 2016

## Purpose and Content

The *Kihei Drainage Master Plan* was developed as an update to the existing drainage plans, and is intended to serve as a comprehensive drainage master plan to mitigate flood risk in the Kihei District. Specifically, the Drainage Master Plan presents updated drainage maps, evaluates the existing hydrologic conditions, assesses the existing infrastructure capacity, and recommends possible flood mitigation improvements for each of eight drainage districts within the study area.

## Findings Related to the Project

The drainage master plan divides the study area into eight drainage districts that correspond to drainage paths and major gulches, and references Piilani Highway as the boundary between the mauka and makai drainage basins. For areas mauka of Piilani Highway, the plan recommends improvements related to (1) limiting runoff with detention basins, (2) diverting flow to major drainageways, and (3) mitigating flood impacts to downstream areas. For areas makai of Piilani Highway, the plan proposes improvements to mitigate flooding by utilizing existing outlets.

Specific recommendations for each of the eight drainage districts are listed in the following table, many of which include improvements that are tied to the roadway and transportation system.

| District | Recommendations |
|---|---|
| Waiakoa | • Construct a channel (Waiakoa Gulch Improvements) from Piilani Highway to the existing outlet to convey design flow. Similar channel could also be considered at mauka side of Piilani Highway up to the location where the split flow occurs.<br>• Ultimately, consider construction of a new bridge at the South Kihei Road crossing as a long-term goal in conjunction with the proposed channel.<br>• Restore and improve the existing ditch mauka of the existing Ohukai Subdivision, and construct a new diversion ditch with the same dimensions as the aforementioned ditch to convey runoff to a proposed detention basin.<br>• Construct a potential storm drainage system on Ohukai Road from Kaiola Place to the ocean. |
| Kulanihakoi | • Construct a diversion channel to direct the flow from Upper Waipuilani Gulch to Kulanihakoi Gulch mauka of Piilani Highway.<br>• Improve the existing channel from makai of Piilani Highway to the ocean to convey the design flow.<br>• Ultimately, consider construction of a new bridge at the South Kihei Road crossing as a long-term goal in conjunction with the improved channel.<br>• Construct detention basins mauka of Piilani Highway for the purposes of both flood and erosion control. |
| Waipuilani | • Construct a diversion channel to direct the flow from Upper Waipuilani Gulch to Kulanihakoi Gulch mauka of Piilani Highway as mentioned in Kulanihakoi District<br>• Improve Waipuilani Gulch from Liloa Drive to the ocean and replace the existing culvert at the South Kihei Road crossing. |

| District | Recommendations |
|---|---|
| Keokea | • Provide a roadway drainage system, drywells along Uluniu Road or construct a new outlet.<br>• Construct detention basins mauka of Piilani Highway for the purposes of both flood and erosion control. |
| Charlie Young | • Construct detention basins mauka of Piilani Highway for the purposes of both flood and erosion control.<br>• Provide and improve existing drainage systems to convey runoff to the ocean for Waimahahaihai Gulch, Kihei Gulch 1, and Kaluaihakoko Stream. |
| Kamaole | • Construct a detention basin mauka of Piilani Highway for the purposes of both flood and erosion control.<br>• Improve Kamaole Gulch from downstream of Kuli Puu Street to the ocean and replace the existing culverts at Maui Coast Hotel and the South Kihei Road crossing.<br>• Provide and improve existing drainage systems at Kihei Kai Nani. |
| Liilioholo | • Replace the existing culvert at the South Kihei Road crossing.<br>• Construct culverts at the existing Kanakanui Road concrete ford crossing and North-South Collector concrete ford crossing. |
| Kilohana Drive | • Consider replacement of the existing culvert at the Piilani Highway Road crossing to convey the 100-year flow. However, per HDOT drainage design standards, the culvert is only required to pass the 50-year peak flow.<br>• Construction of a channel in Wailea SF-58 development could be considered to claim more useable lands. |

## Applications to this Project

### To Develop Project Goals and Objectives:

The *Kihei Drainage Master Plan* seeks to mitigate flood risk by identifying improvements that address both existing and future development throughout the Kihei District. Although the drainage master plan does not specifically address the regional transportation system, many of the drainage features are tied to existing roadways and other transportation infrastructure. The purpose and findings of the drainage master plan will be considered as part of the development of the Project goals and objectives in order to provide more a comprehensive and practical planning framework.

### To Develop Potential Project Solutions:

Although the recommendations in the *Kihei Drainage Master Plan* are not specifically focused on the transportation system, many are directly related to existing or potential future transportation infrastructure. The recommended improvements in the *Kihei Drainage Master Plan* will be considered as the part of the development of potential Project solutions so as to maximize the effectiveness and practicality of the Project by avoiding potential conflicts, capitalizing on overlapping improvements, and leveraging available resources.

# 12. Maui Short Range Transit Plan, April 2016

## Purpose and Content

The purpose of the *Maui Short Range Transit Plan* is to guide transit services provided by the County of Maui Department of Transportation for a six-year period (through 2022). The plan includes background information as the foundation for the need for future service improvements and capital investments, presents the results of an analysis of the existing transit system, and provides recommendations for implementation action.

## Findings Related to the Project

The plan presents proposed implementation actions by area for Central Maui, Kihei, Lahaina to Napili and Upcountry. Each of the areas is planned to work as a system within the individual service community, as well as in connection with the system in Central Maui.

Specific to the Kihei route system, the plan recommends maintaining the basic structure of the Kihei Islander Route, while expanding to serve more neighborhoods. The recommended route system is focused on a transfer center in the vicinity of the Piilani Village Shopping Center, with the bus stop relocated on-street to eliminate movement through the shopping center.

The Kihei Islander route will operate along its current alignment, with only minor changes. These include new bus stops on Piikea Street (both makai of Liloa Drive, and mauka of Liloa Drive to serve the Piilani Shopping Center), S. Kihei Road, and S. Pu'unene Avenue (near Hololea Street and E. Kauai Street), as well as later evening alignment changes from Central Maui to serve Ma'alaea Harbor before traveling to Kihei. The Kihei Villager route will operate as two shuttle routes: North Kihei and South Kihei, which connect along Piikea Avenue by the Piilani Shopping Center. The North Kihei Villager will operate from Ma'alaea Harbor based on the current Kihei Villager route. The route will serve the residential area mauka of Piilani Highway, then return to Piikea Street and serve the Piilani Shopping Center. The South Kihei Villager is designed to connect with the North Kihei Villager and the Islander along Piikea Street. This route would provide new service to residential areas along East and West Welakahao Road, Auhana, Alanui Kealii, Kauhale and Akala Drive. It would terminate at the current end point of the Kihei Islander at Wailea Iki Drive. The addition of the South Kihei Villager will allow the Kihei Islander to provide additional express services to the Piilani shopping center allowing continuing passengers to transfer to the Villager routes. The express services would terminate at the Piilani Shopping Center.

## Applications to this Project

### To Develop Project Goals and Objectives:

Development of the Project goals and objectives will consider transit requirements and recommendations in an effort to recognize the needs of the broader transportation system.

### To Develop Potential Project Solutions:

Potential Project solutions will be developed and prioritized with consideration given to the proposed service improvements identified in the *Maui Short Range Transit Plan*. The Project will incorporate transit improvements that are implemented over the near term, and will seek to accommodate longer term recommendations in an effort to improve the overall transportation network.

# 13. Hele Mai Maui Long-Range Transportation Plan 2040 Final Plan, December 2019

## Purpose and Content

*Hele Mai Maui Long Range Transportation Plan 2040* is a 20-year plan developed by the Maui Metropolitan Planning Organization (MPO) to make movement around Maui safe and comfortable. It identifies transportation projects, services, and programs to improve transportation options for people of all ages and abilities. The long-range transportation plan is a federal requirement contained in the Code of Federal Regulations at 23 CFR 450.324.

The content requirements of the metropolitan transportation plan include, but are not limited to, the following:

- current and projected transportation demand of people and freight over the forecast period
- existing and proposed transportation facilities
- performance measures and performance targets
- operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize safety and mobility
- assessment of capital investment and other strategies to preserve the existing and future transportation infrastructure, provide for multimodal capacity increases, and reduce vulnerability of the existing transportation infrastructure to natural disasters
- transportation and transit enhancement activities, including consideration of the role that buses may play in reducing congestion, pollution, and energy consumption
- financial plan that demonstrates how the adopted transportation plan can be implemented

## Findings Related to the Project

*Hele Mai Maui 2040* complements the *Kihei Sub-area Transportation Plan*. Data are generally comparable because the two planning efforts occurred during the same time frame. Readers will find it helpful to consult both documents to see different presentation styles, formats, and perspectives. And because the scope of the MPO transportation plan is island-wide, it allows for comparison of transportation information between Kihei and other Maui communities.

An important general finding is the high degree of overlap between the transportation goals of *Hele Mai Maui 2040* and the *Kihei Sub-area Transportation Plan*. Evaluation methodologies are also similar between the two plans, except the MPO plan uses scenarios to assess combinations of projects and programs to meet long-range transportation goals whereas the *Kihei Sub-area Transportation Plan* does not use this analytical tool. The investment scenarios developed were (1) provide new connections, (2) create a multimodal system, and (3) take care of what we have. Recommended projects for Kihei, shown on page 41 of *Hele Mai Maui 2040*, are consistent with the projects and priorities identified in the *Kihei Sub-area Transportation Plan*.

# Appendix B
# Project Sheets

KIHEI SUB-AREA
TRANSPORTATION PLAN

KIHEI

# Project #1
# Upcountry Connector

## Background and Needs

The primary route connecting Kihei and Upcountry (Makawao-Pukalani-Kula area) requires traveling a circuitous route through central Maui via Haleakala Highway and Mokulele Highway/Kuihelani Highway, a distance of at least 16 miles. There is regular travel between these two areas, as Kihei is one of the island's employment centers, attracting workers living in Upcountry, and Upcountry offers destinations (such as Haleakala National Park) that are popular with visitors staying in Kihei. A more direct link would enhance the island's regional transportation network by reducing travel times and increasing the overall network capacity.


**Upcountry Connector**

## Potential Solution

Construct a new limited access, 2-lane arterial roadway between Kihei and Upcountry. The Final Environmental Impact Statement for Kihei Upcountry Maui Highway (February 2002) identified a preferred alignment from Piilani Highway at Kaonoulu Street to Haleakala Highway at Haliimaile Road with a length of approximately 9.8 miles. In addition to providing a shorter alternate route, the Upcountry Connector would address congestion at pinch points, respond to future growth, and increase capacity for coastal evacuation and emergency access.

## Jurisdiction

State of Hawaii

## Cost Estimate

$109,645,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Regional Capacity and Mobility*** |
| | ***Land Use*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Long Range Land Transportation Plan 1997, S17; Kihei Traffic Master Plan 1996; Highway Modernization Plan (1/28/2009), C1-308; Online Open House

# Project #2
# Piilani Highway and Uwapo Road

## Background and Needs

There is a lack of sidewalks approaching Piilani Highway from Uwapo Road to the west and Kaiwahine Street to the east. The sidewalk on Uwapo Road is discontinuous with a gap of approximately 800 feet between South Kihei Road and Kaiolohia Street. Approaching Piilani Highway, concrete swales are located in the shoulders on both sides of Uwapo Road. On the *mauka* side of Piilani Highway, a sidewalk has been constructed in association with new residential development off Kaiwahine Street, but there is a short gap between the end of the sidewalk and the Piilani Highway intersection. Providing sidewalks to fill in existing gaps would increase pedestrian safety and may lead to more people making trips on foot.


*# 2 - Piilani Highway and Uwapo Road Intersection Improvements*

## Potential Solution

Construct sidewalks to provide a continuous pedestrian facility along Uwapo Road and Kaiwahine Street, filling in all existing gaps. This will allow residents and tourists a pedestrian facility to use instead of using roadway shoulders or uneven ground.

## Jurisdiction

State of Hawaii/County of Maui

## Cost Estimate

$743,000

## Additional Right-of-way Anticipated

Undetermined

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Complete Streets*** | ***Right-of-way*** |
| ***Cost*** | ***Accessibility*** |

## Source

6/22/18 4th Friday

# Project #3
# North-South Collector Road – Phase 1B (Kaonoulu Street to Kulanihakoi Street)

## Background and Needs

With the increase in development and population, traffic volume on South Kihei Road and Piilani Highway (which provide access in the north-south direction through Kihei) has become increasingly high. Both Kaonoulu Street and Kulanihakoi Street connect Piilani Highway to South Kihei Road and have residential areas on the north and south side of the roadway. An alternate route that connects the two roads in the north-south direction are needed to relieve congestion and improve circulation on the existing roadways.

## Potential Solution

Construct a new, approximately 0.35-mile-long, 2-lane collector road parallel to Piilani Highway between Kaonoulu Street and Kulanihakoi Street, with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, and street lighting. This project is partially completed as Kenolio Street from Kaonoulu Street to Hoopili Akau Street.


*#3 - North-South Collector Road - Phase 1B*

## Jurisdiction

County of Maui

## Cost Estimate

$20,000,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Complete Streets*** | ***Right-of-way*** |
| ***Local Capacity and Congestion*** | ***Land Use*** |
| ***Economic Vitality*** | ***Accessibility*** |

## Source

STIP; Federal-Aid Highways 2035 Long Range Land Transportation Plan; Maui Island Plan; TAC; Online Open House

# Project #4
# North-South Collector Road – Phase 1A (Kulanihakoi Street to E Waipuilani Road)

## Background and Needs

As with North-South Collector Road – Phase 2 (Project #3), an alternate route that provides access in the north-south direction is needed to relieve congestion and improve circulation on the existing roadways. The area between Kulanihakoi Street and East Waipuilani Road consists of residential development with no connection in the north-south direction besides South Kihei Road and Piilani Highway. When South Kihei Road becomes flooded during high rainfall events, there are no exit routes from Hoonani Street and Namauu Place. Residents on these streets have requested roadways that would provide alternate exit routes.


*#4 - North-South Collector Road - Phase 1A*

## Potential Solution

Construct a new, approximately 0.45-mile-long, 2-lane collector road parallel to Piilani Highway between Kulanihakoi Street and East Waipuilani Street, with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, and street lighting. The new collector road would improve circulation and relieve traffic congestion as well as provide exit routes from Hoonani Street and Namauu Place through Piilani Highway.

## Jurisdiction

County of Maui

## Cost Estimate

$23,000,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Complete Streets*** | ***Right-of-way*** |
| ***Local Capacity and Congestion*** | ***Land Use*** |
| ***Economic Vitality*** | ***Accessibility*** |

## Source

STIP; Federal-Aid Highways 2035 Long Range Land Transportation Plan; Maui Island Plan; Department of Public Works list; TAC; Online Open House

# Project #5
# North-South Collector Road – Liloa Drive (Halekuai Street to E Welakahao Road) – Phase 3

## Background and Needs

Liloa Drive runs parallel to Piilani Highway between East Waipuilani Road to just past Halekuai Street. Extension of Liloa Drive to East Welakahao Road is Phase 3 of what is otherwise known as the North-South Collector Road. Completion of the North-South Collector Road is needed to expand the network of local streets. Shifting shorter distance trips onto the local street grid would divert a portion of the traffic volume from Piilani Highway, which could revert to functioning as primarily as a highway for regional or longer distance travel.

The Kihei regional gym will be completed in 2019. It will be the largest indoor recreational facility on Maui, generating traffic impacts on surrounding roadways.


*#5 - North-South Collector Road - Phase 3*

## Potential Solution

Construct a new, approximately 0.35-mile long, 2-lane collector road parallel to Piilani Highway between Halekuai Street and East Welakahao Road with separated greenway to accommodate pedestrians and bikes. Extending the general design of the previously constructed segment, Phase 3 would include a new roadway with concrete curb and gutters; traffic signage and markings; and street lighting, as well as a separated greenway to accommodate pedestrians and bicycles. The Phase 3 project would alleviate congestion associated with major facilities, such as schools, parks, and gym, by supporting north- and south-bound traffic on Liloa Drive.

## Jurisdiction

County of Maui

## Cost Estimate

$18,204,000

## Additional Right-of-way Anticipated

Yes

**Future North-South Road Phase 3, south of Halekuai Street**

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Local Capacity and Congestion*** |
| | ***Economic Vitality*** |
| | ***Land Use*** |
| | ***Accessibility*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Maui Island Plan; TAC; Online Open House

# Project #6
# North-South Collector Road – Liloa Drive (E Welakahao Road to Keala Place)

## Background and Needs

This project would extend Liloa Drive constructed from East Welakahao Road to Keala Place. Liloa Drive exists through this section as an unimproved pavement. Completion of the road through this section is needed to complete the north-south collector road that runs through South Kihei.

## Potential Solution

Construct a new, approximately 0.5-mile-long, 2-lane collector road parallel to Piilani Highway between East Welakahao Road and Keala Place, with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, and street lighting. The new collector road would complete the unimproved section of Liloa Drive that serves as a north-south collector road through South Kihei.

## Jurisdiction

County of Maui

## Cost Estimate

$27,111,000


*#6 - North-South Collector Road - Liloa Drive*

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Complete Streets*** | ***Land Use*** |
| ***Local Capacity and Congestion*** | ***Accessibility*** |
| ***Economic Vitality*** | |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Maui Island Plan; TAC; Online Open House

# Project #7
# North-South Collector Road – Keala Place to Auhana Road

## Background and Needs

The only route that currently provides access between Keala Place and Auhana Road is South Kihei Road. Keala Place is a dead end at the eastern end with no connection to Piilani Highway. A road between Keala Place and Auhana Road is needed to complete the north-south collector road through the southern part of Kihei. In addition, an alternate route is needed in case of emergency situations during which South Kihei Road cannot be used.

## Potential Solution

Construct a new, approximately 0.30-mile-long, 2-lane collector road parallel to South Kihei Road between Keala Place and Auhana road, with separated greenway to accommodate pedestrians and bikes, new concrete curb and gutters, traffic signage and markings, and street lighting. The new road would improve circulation and relieve traffic congestion as well as provide exit route from Keala Place. The alignment shown on the map is conceptual and requires further study, including exploration of alternate routes.


*#7 - North-South Collector Road - Keala Place to Auhana Rd*

## Jurisdiction

County of Maui

## Cost Estimate

$12,081,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Complete Streets*** | ***Land Use*** |
| ***Local Capacity and Congestion*** | ***Accessibility*** |
| ***Economic Vitality*** | |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Maui Island Plan; Online Open House

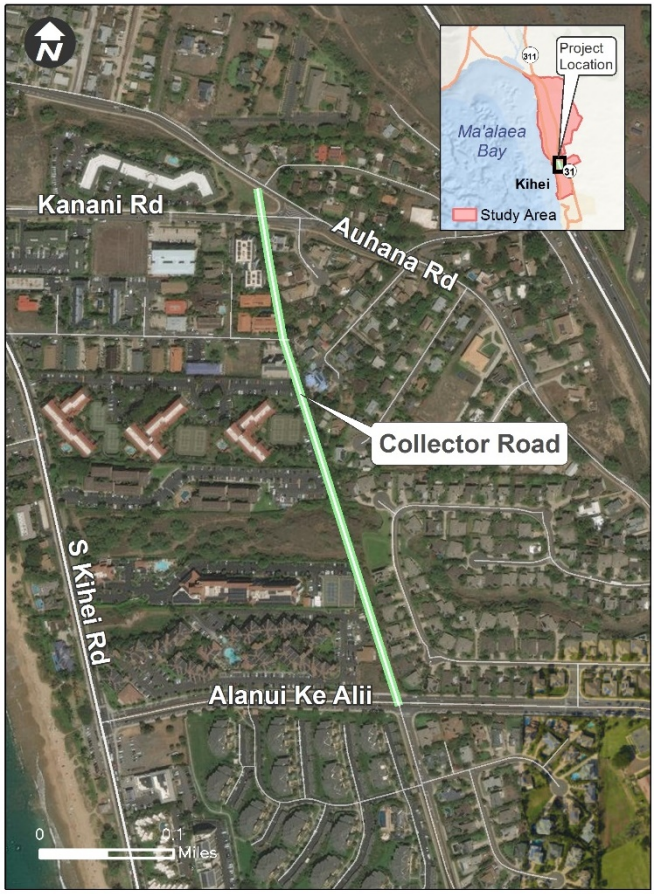
# Project #8
# North-South Collector Road – Auhana Road to Alanui Ke Alii

## Background and Needs

The area between Auhana Road and Alanui Ke Alii is fully developed with residential housing and condominiums, as well as large hotels. Access between the two roads is provided by South Kihei Road on the western side and the eastern part of Auhana Road and Piilani Highway on the eastern side. An alternate shorter route that cuts through the area between the two roads would improve circulation and improve traffic congestion currently experienced in the area.

## Potential Solution

Construct a new, approximately 0.4-mile long, 2-lane collector road between Auhana Road and Alanui Kealii with separated greenway to accommodate pedestrians and bikes; new concrete curb and gutters; traffic signage and markings; and street lighting. The alignment shown on the map is conceptual and requires further study, including exploration of alternate routes.




*#8 - North-South Collector Road - Auhana Rd to Alanui Ke Alii*

## Jurisdiction

County of Maui

## Cost Estimate

$38,409,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Complete Streets*** | ***Land Use*** |
| ***Local Capacity and Congestion*** | ***Accessibility*** |
| ***Economic Vitality*** | |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Maui Island Plan; Online Open House

# Project #9
# Kenolio Road Speed Control

## Background and Needs

There are concerns about persistent speeding on Kenolio Road in front of the Kihei Youth Center. Although there are designated crosswalks and crossing signs, pedestrians remain wary about the vehicles exceeding the speed limit the area. Because parking for the Kihei Youth Center is accessed via Kenolio Road, traffic flow can be heavier near the crossing.

## Potential Solution

Install speed bumps or speed tables in front of the Youth Center on Kenolio Road near crosswalks to constrain drivers to lower speeds when approaching.

## Jurisdiction

County of Maui

## Cost Estimate

$11,000

## Additional Right-of-way Anticipated

None anticipated


**# 9 - Kenolio Road Speed ControlnterI**


**Pedestrian crossing on Kenolio Road near Kihei Youth Center**

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
|  | ***Cost*** |
|   | ***Right-of-way*** |
|  | ***Land Use*** |
|  | ***Natural Environment*** |
|  | ***Cultural Resources*** |

## Source

CAC

# Project #10
# Pedestrian Crossing at Kihei Youth Center

## Background and Needs

The Kihei Youth Center, adjacent to Kenolio Park, is located between South Kihei Road and Kenolio Road. The center focuses on youth and family development, providing educational, recreational, vocational, cultural, social, and prevention programs. Operations occur 7 days a week. Both the Kihei Youth Center and park attract users who walk and bicycle. There is a crosswalk on Kenolio Road near the center's driveway; however, there is no crosswalk on the South Kihei Road side. The center lies approximately midway between Uwapo Road and Leilani Road, where South Kihei Road stretches continuously for approximately 1,700 feet without a crosswalk. High traffic volume makes it inconvenient for pedestrians who wish to cross from the *makai* (oceanward) side to the Kihei Youth Center and Kenolio Park on the *mauka* side.


**# 10 - Pedestrian Crossing at Kihei Youth Center**


## Potential Solution

A potential solution is to conduct a traffic study to ensure that a crosswalk would be warranted for the entrance on South Kihei Road. If warranted, install a crosswalk along with rectangular rapid flash beacon (RRFB) LEDs to ensure safety for pedestrian.

## Jurisdiction

County of Maui

## Cost Estimate

$282,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Cost*** | ***Natural Environment*** |
| ***Right-of-way*** | ***Cultural Resources*** |
| ***Land Use*** | |

## Source

KCA; Kihei Makena Roadway and Drainage Guidelines

# Project #11
# Kihei *Mauka* Bypass – Mokulele Highway to Kanani Road

## Background and Needs

Piilani Highway and South Kihei Road are the two roads that run in a north-south direction and provide access to residential, commercial, and resort areas in Kihei. With the increased development and population growth, traffic volumes on these roads are high.

## Potential Solution

Build a *mauka* bypass of Piilani Highway from Mokulele Highway to approximately Kanani Road and realign North Kihei Road to the new intersection. This alternate route would increase road capacity for vehicles and bicycles and alleviate traffic congestion on the existing roads. The specific alignment and design standards require further study and should be coordinated with long-term development of *mauka* lands.

## Jurisdiction

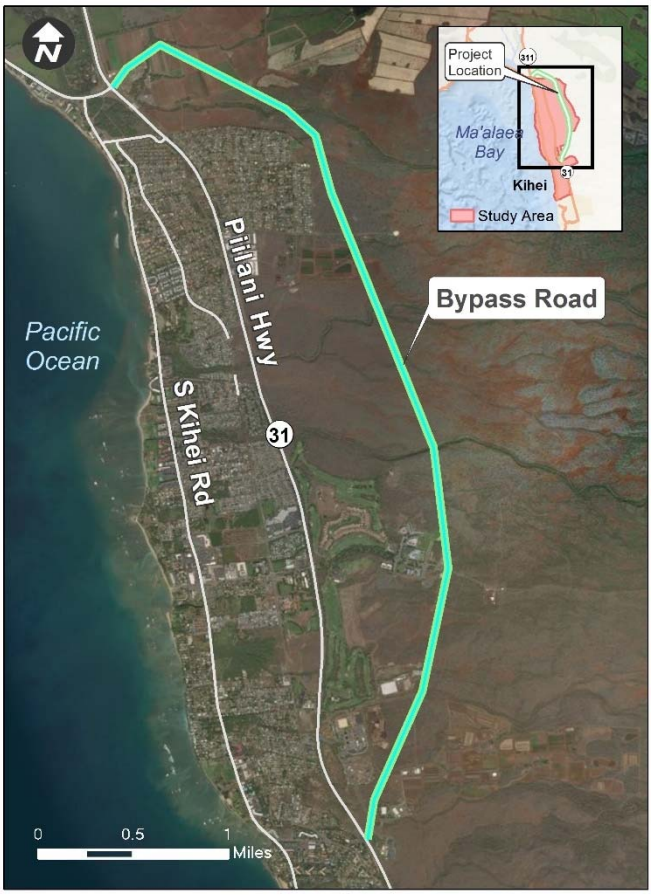
State of Hawaii/County of Maui

## Cost Estimate

$75,945,000

## Additional Right-of-way Anticipated

Yes




*#11 - Kihei Mauka Bypass - Mokulele Highway to Kanani Road*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Regional Capacity and Mobility*** |
| | ***Land Use*** |
| | ***System Preservation and Resiliency*** |
| | ***Economic Vitality*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Maui Island Plan 2010 draft; Online Open House

# Project #12
# Kihei Greenway

## Background and Needs

With the increase in development and residential areas, traffic volume is becoming increasingly high on existing roadways. Creating adequate space for bicyclists and other non-vehicular travelers is needed so that users can not only travel safely but also feel comfortable using existing roadways.

## Potential Solution

Construct a shared-use path along the North-South Collector from Kulanihakoi Street to East Waipuilani Road. A shared-use path is a bikeway that is physically separated from motor vehicle traffic by open space or a physical barrier such as dense shrubbery or railing. Users could include bicyclists, skaters, skateboarders, wheelchair users, and pedestrians. Shared-use paths can also be striped to separate user types and reduce potential conflicts. The shared-use path along this corridor would allow users to travel safely and promote or provide an opportunity for the community to use alternate transportation modes.


*#12 - Kihei Greenway*

The idea of a multimodal spine through Kihei, called the Kihei Greenway, has been included in other plans, notably Bike Plan Hawaii (HDOT, 2003). If this section of the greenway is implemented separately from the North-South Collector Road, it should be designed in anticipation of future roadway construction.

## Jurisdiction

County of Maui

## Cost Estimate

$4,355,000

## Additional Right-of-way Anticipated

Yes

**Completed section of Kihei Greenway, fronting Lokelani Intermediate School**

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |
| | ***Accessibility*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Bike Plan Hawaii 2003 No. 56a and 56b; Online Open House

# Project #13
# Kihei Greenway Phase 2

## Background and Needs

This would be similar to Project #12, covering a longer section along the North-South Collector. Adequate space on existing roadways for bicyclists and other non-vehicular travelers is needed so that users can travel safely and feel comfortable using existing roadways.

## Potential Solution

Construct a shared-use path along the North-South Collector from Halekuai Street to Kilohana Drive (the segment between East Lipoa Street and Halekuai Street is complete). A shared-use path along this longer segment of the North-South Collector would provide users with a continuous route to travel in the north-south direction through South Kihei.

The idea of a multimodal spine through Kihei, called the Kihei Greenway, has been included in other plans, notably Bike Plan Hawaii (HDOT, 2003). If this section of the greenway is implemented separately from the North-South Collector Road, it should be designed in anticipation of future roadway construction.


*#13 - Kihei Greenway Phase 2*

## Jurisdiction

County of Maui

## Cost Estimate

$9,225,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |
| | ***Accessibility*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Bike Plan Hawaii 2003 No. 56a and 56b

# Project #14
# Bike Facility along South Kihei Road

## Background and Needs

A lack of continuous bike facility that is safe to travel along South Kihei Road makes it difficult for bikers to travel in the lateral direction through Kihei and to access the shoreline areas.

## Potential Solution

Establish a continuous trail/greenway/bikeway system from Kealia Pond to Kilohana Drive, to provide pedestrian lateral accesses to the Kihei-Makena shoreline and to protect and maintain traditional shoreline access.

## Jurisdiction

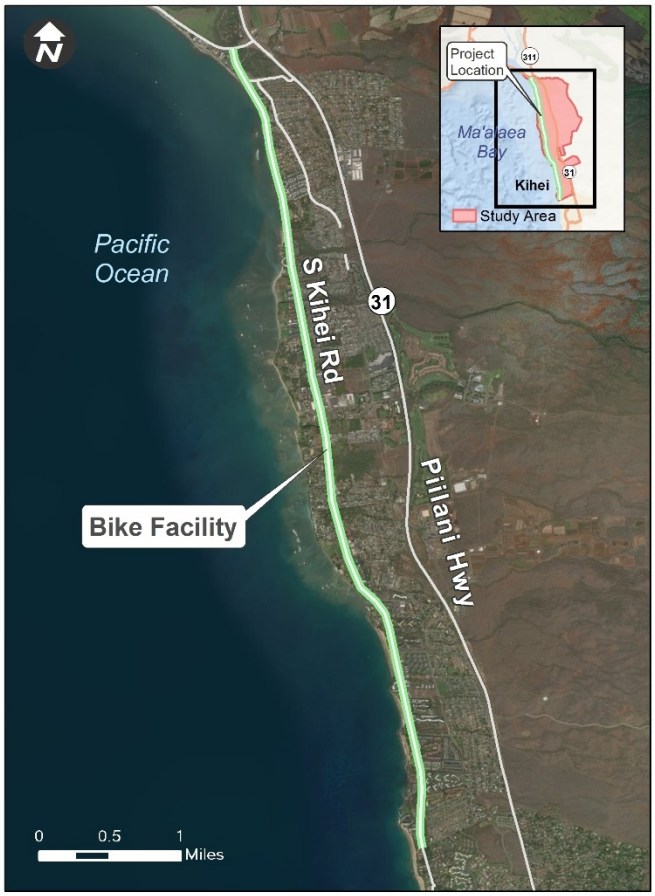
State of Hawaii/County of Maui

## Cost Estimate

$71,061,000

## Additional Right-of-way Anticipated

Yes




*#14 - Bike Facility along S. Kihei Road, South Kihei Road - Uwapo Road to Okolani Drived*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |

## Source

Kihei-Makena Community Plan 1998; Online Open House

# Project #15
# Kenolio Road Bike Facility

## Background and Needs

A lack of continuous bike facility between Uwapo Road and Ohukai Road makes it difficult and dangerous for bikers to travel along Kenolio Road.

## Potential Solution

Build a bike facility along Kenolio Road between Uwapo Road and Ohukai Road as an alternate route to South Kihei Road. The bike facility may include a combination of striped bike lanes (where existing road space is available) or, where there is insufficient room for shoulders or a wide outside lane, arrows designating shared paths (sharrows).

## Jurisdiction

County of Maui

## Cost Estimate

$44,000

## Additional Right-of-way Anticipated

None anticipated


*# 15 - Kenolio Road Bike Facility*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Cost*** |
| | ***Right-of-way*** |
| | ***Land Use*** |

## Source

TAC

# Project #16
# South Kihei Road and Uwapo Road Intersection Improvements

## Background and Needs

The intersection at South Kihei Road and Uwapo Road is configured as a T-intersection with stop control, where there is a single stop sign on Uwapo Road for vehicles turning left onto South Kihei Road. Vehicles traveling on approaches that are stop-controlled can sometimes experience long delays at the intersection while waiting to find an acceptable gap in traffic before moving into the intersection.

## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase movement capacity through the intersection, especially for motorists traveling *makai* on Uwapo Road who wish to turn left onto southbound South Kihei Road. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.


***Existing South Kihei Road and Uwapo Road intersection***


## Jurisdiction

County of Maui

## Cost Estimate

$1,799,000 - $4,494,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Kihei Traffic Master Plan 2005

# Project #17
# South Kihei Road and Leilani Road Intersection Improvements

## Background and Needs

The T-intersection at South Kihei Road and Leilani Road is currently stop-controlled, with one stop sign on Leilani Road. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. Leilani Road and South Kihei Road intersection currently do not have any crossing facilities, which can be dangerous for pedestrians using the intersection.


#17 - Pedestrian Crossing at Leilani Road

## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles using Leilani Road turning into South Kihei Road, not only increasing the movement capacity for vehicles but also increasing safety and mobility for pedestrians in the area. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.


## Jurisdiction

County of Maui

## Cost Estimate

$1,799,000 - $4,494,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Right-of-way*** | ***Natural Environment*** |
| ***Land Use*** | ***Cultural Resources*** |

## Source

KCA; Kihei Makena Roadway and Drainage Guidelines

# Project #18
# South Kihei Road and Ohukai Road Intersection Improvements

## Background and Needs

The T-intersection at South Kihei Road and Ohukai Road is currently stop-controlled, with one stop sign on Ohukai Road. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. With the peak hour volume of approximately 200 vehicles going Westbound of Piilani Highway on Ohukai Road, cars can quickly build up in Ohukai Road if South Kihei Road has a consistent flow of traffic.


**# 18 - South Kihei Road and Ohukai Road Intersection Improvements**

## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles using Ohukai Road turning into South Kihei Road. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.


## Jurisdiction

County of Maui

## Cost Estimate

$1,799,000 - $4,494,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Kihei Traffic Master Plan 2005

# Project #19
# Ohukai Sidewalks

## Background and Needs

Ohukai Road is an east-west route between Piilani Highway and South Kihei Road. On the *mauka* side of the highway, it extends into the residential subdivision, Kihei Gateway Plaza, and mixed-use district of commercial and light industrial businesses. For people in the *mauka* area, the Ohukai Road connector provides access to bus service on South Kihei Road. Under current conditions Ohukai Road is not pedestrian friendly, with gaps in the sidewalk requiring pedestrians to use shoulders that are sometimes narrow, uneven, and overgrown with vegetation.


*# 19 - Ohukai Sidewalks*

## Potential Solution

Provide a pedestrian route on Ohukai Road from South Kihei Road to Huku Lii Place by constructing sections of sidewalk to fill in the gaps or upgrade the entire alignment through a combination of reconstruction and new construction. Where practicable, a continuous pedestrian facility on the same side of the road is preferred.

## Jurisdiction

County of Maui

## Cost Estimate

$809,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Accessibility*** |
| | ***Safety*** |

## Source

6/22/18 4th Friday; Online Open House

# Project #20
# Pedestrian Crossing at Mai Poina Beach Park

## Background and Needs

There are two crosswalks that may be used to reach Mai Poina Beach Park from the *mauka* side of South Kihei Road: one at the unsignalized Ohukai Road intersection and one approximately 850 feet south in front of the Kai Makani Beach Villas. There is no crosswalk in front of the park comfort station, which is a natural crossing location for pedestrians. The spacing of existing crosswalks and lack of crossing aids creates potential difficulties for pedestrians who wish to cross the street, as well as for drivers who encounter midblock crossers. Pedestrians need another safe crossing facility to Mai Poina Beach Park on South Kihei Road between the two existing ones.


**# 20 - Pedestrian Crossing at Mai Poina Beach Park**


## Potential Solution

Install a midblock crossing facility with crosswalk striping and signage on South Kihei Road close to the comfort station. Pedestrian-activated flashing beacons should be considered for the midblock crosswalks.

## Jurisdiction

County of Maui

## Cost Estimate

$44,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Cost*** | ***Natural Environment*** |
| ***Right-of-way*** | ***Cultural Resources*** |
| ***Land Use*** | ***Safety*** |

## Source

KCA; Kihei Makena Roadway and Drainage Guidelines

# Project #23
# South Kihei Road and Kulanihakoi Street Intersection Improvements

## Background and Needs

The T-intersection at South Kihei Road and Kulanihakoi Street is currently stop-controlled, with one stop sign on Kulanihakoi Street. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. With the peak hour volume of approximately 100 vehicles going *makai* on Kulanihakoi Street west of Oluea Street, cars can quickly build up on Kulanihakoi Street if South Kihei Road has a consistent flow of traffic. In the future, Kulanihakoi Street will provide direct access to Kihei High School on the *mauka* side of Piilani Highway.


#23 - South Kihei Road and Kulanihakoi Street Intersection Improvements


## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles using Kulanihakoi Street turning into South Kihei Road. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.

## Jurisdiction

County of Maui

## Cost Estimate

$1,800,000 - $4,500,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | | | |
|---|---|---|---|
| ROW | ***Right-of-way*** | | ***Safety*** |
| | ***Land Use*** | | |

## Source

Kihei Traffic Master Plan 2005, Department of Public Works list

# Project #24
# South Kihei Road and Kanani Road Intersection Improvements

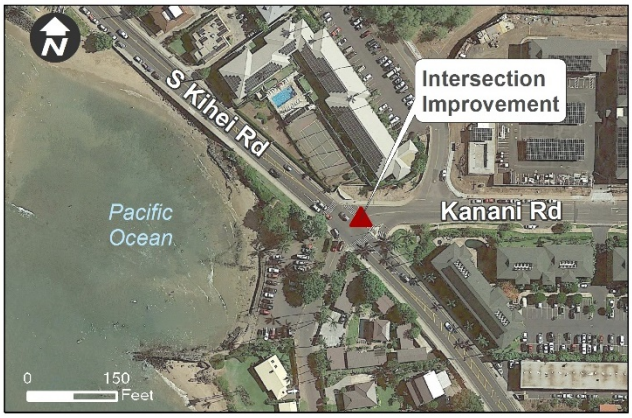
## Background and Needs

The intersection at South Kihei Road and Kanani Road is currently stop-controlled, with one stop sign on Kanani Road and one on Iliili Road. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. With the peak hour volume of approximately 100 vehicles going Westbound of Kanoe Street on Kanani Road, cars can quickly build up in Kanani Road and Iliili Road if South Kihei Road has a consistent flow of traffic.


#24 - South Kihei Road and Kanani Road Intersection Improvements

## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles using Kanani Road turning into South Kihei Road. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.




## Jurisdiction

County of Maui

## Cost Estimate

$1,800,000 - $4,500,00

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Right-of-way*** | ***Safety*** |
| ***Land Use*** | |

## Source

Kihei Traffic Master Plan 2005; Department of Public Works list

# Project #25
# South Kihei Road and Keonekai Road Intersection Improvements

## Background and Needs

The intersection of South Kihei Road and Keonekai Road has experienced a relatively high frequency of crashes involving vehicles and pedestrians or bicycles. At least four crashes involving non-motorized modes have occurred at the intersection since 2012. Congestion is another issue. The T-intersection is stop controlled, with one stop sign on Keonekai. Because traffic on South Kihei Road is free-flowing, motorists approaching the intersection on Keonekai must wait to find an acceptable gap in traffic before moving into the intersection. With a peak hour volume of approximately 150 vehicles traveling *makai* on Keonekai, cars can quickly stack up if breaks in the South Kihei Road traffic are infrequent.


*# 25 South Kihei Road and Keonekai Road Intersection Improvements*


## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles turning left onto South Kihei Road from Keonekai Road. Signalization or roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.

## Jurisdiction

County of Maui

## Cost Estimate

$1,800,000 - $4,500,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Right-of-way*** | ***Safety*** |
| ***Land Use*** | |

## Source

Preliminary analysis of crash hot spots; Kihei Traffic Master Plan 2005; Online Open House

# Project #26
# South Kihei Road and Namauu Place Intersection Improvements

## Background and Needs

The T-intersection at South Kihei Road and Namuu Place is currently stop-controlled, with one stop sign on Namuu Place. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection, making it difficult to make left turns onto South Kihei Road from Namauu Place.


#26 - South Kihei Road and Namauu Place Intersection Improvements

## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles using Namauu Place turning into South Kihei Road. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.


## Jurisdiction

County of Maui

## Cost Estimate

$1,800,000 - $4,500,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Right-of-way*** | ***Safety*** |
| ***Land Use*** | |

## Source

Department of Public Works list

# Project #27
# South Kihei Road and Hoonani Street Intersection Improvements

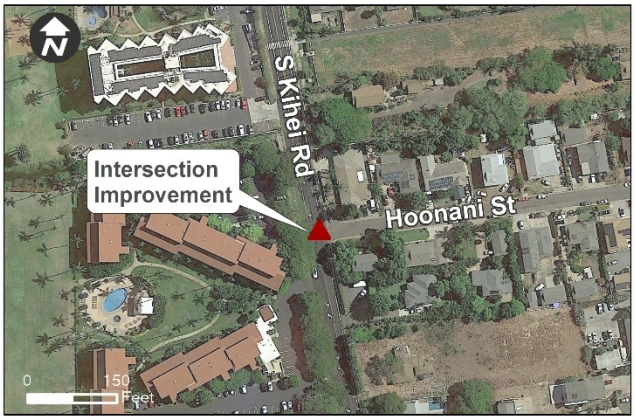
## Background and Needs

The T-intersection at South Kihei Road and Hoonani Street is currently stop-controlled, with one stop sign on Hoonani Street. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection, making it difficult to make left turns onto South Kihei Road from Hoonani Street.


#27 - South Kihei Road and Hoonani Street Intersection Improvements

## Potential Solution

Construct a new traffic signal, roundabout, or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles using Hoonani Street turning into South Kihei Road. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.




## Jurisdiction

County of Maui

## Cost Estimate

$1,800,000 - $4,500,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Right-of-way*** | ***Safety*** |
| ***Land Use*** | |

## Source

Department of Public Works list

# Project #28
# South Kihei Road, Kulanihakoi Drainage District

## Background and Needs

With increased development and rapid population growth in Kihei, storm water conveyance and drainage improvements are needed to mitigate potential flood risks in the area. The 2016 *Kihei Drainage Master Plan* assessed existing drainage conditions of the Kihei District, which included identifying existing drainage structures and outlets and evaluating how storm water flows are routed through the structures. Proposed improvements were recommended based on the existing outlet conditions as well as based on planned development projects and their potential impacts on drainage patterns and capacity in the area.

Kulanihakoi Gulch is the major drainageway within the Kulanihakoi Drainage District and has the largest drainage area in the Kihei District. The existing box culverts located under South Kihei Road do not have sufficient capacity to convey runoff for the 100-year storm, resulting in runoff overtopping South Kihei Road during heavy rainfall. The sand dunes accumulating at the mouth of the gulch intensify the flooding problems and cause backwater effects, also resulting in flooding problems in upstream areas.


**# 28 - South Kihei Road, Kulanihakoi Drainage District**


## Potential Solution

Construct a new bridge (130-foot span) at the South Kihei Road crossing that could be considered a long-term goal to pass the design flow to the ocean. Because of the flat terrain at the crossing, this solution may require reconstruction of South Kihei Road from the Kaonoulu Street intersection to Kihei Bay Vista, as well as the private driveways in the vicinity. Elevating the roadway and utility relocations may be required to raise the bridge and the approaches to provide an opening large enough to pass the design flow.

## Jurisdiction

County of Maui

## Cost Estimate

$42,941,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***System Preservation and Resiliency*** | ***Land Use*** |
| ***Right-of-way*** | |

## Source

Kihei Drainage Master Plan 2016

# Project #29
# South Kihei Road Sidewalks (Uwapo Road to Piikea Avenue)

## Background and Needs

South Kihei Road currently has sidewalks installed but has missing gaps throughout the street: approximately 2.3 miles in sidewalk gaps between Uwapo Road and Piikea Avenue. Providing sidewalks to fill in existing gaps will increase pedestrian safety and may lead to more residents and tourists making trips on foot.

## Potential Solution

Constructing new sidewalks to fill in all existing gaps on South Kihei Road from Uwapo Road to Piikea Avenue. This will allow residents and tourists a pedestrian facility to use instead of using roadway shoulders, bike lanes, or uneven ground.

## Jurisdiction

County of Maui

## Cost Estimate

$3,101,000

## Additional Right-of-way Anticipated

None anticipated


*#29 - South Kihei Road Sidewalks*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Online Open House

# Project #30
# South Kihei Road Shared Roadway (Ohukai Road to Mokulele Highway)

## Background and Needs

The lack of a continuous bicycle facility on South Kihei Road between Ohukai Road and Mokulele Highway makes it difficult for bicyclists to travel along an important corridor.

## Potential Solution

Designate South Kihei Road as a signed shared road from Ohukai Road to Mokulele Highway. A signed shared roadway is a street or highway determined to be a preferred route for bicycles as indicated by signs. Where there is insufficient room for shoulders or a wide outside lane, arrows designating shared paths (sharrows) are often used to increase awareness of multimodal roadway use. See also Project #32.

## Jurisdiction

County of Maui

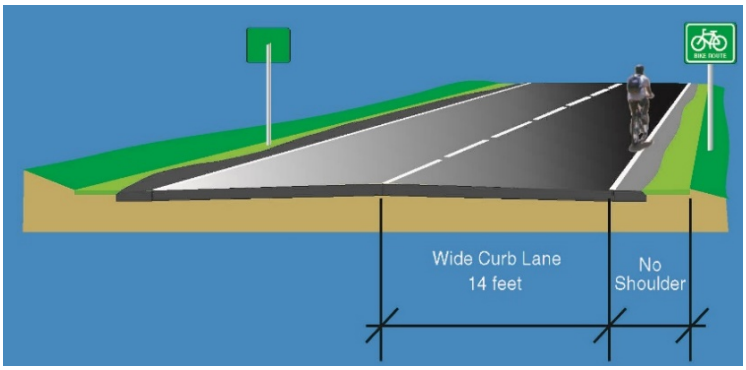
## Cost Estimate

$78,000

## Additional Right-of-way Anticipated

None anticipated


*# 30 - South Kihei Road Shared Roadway*




**Signed shared roadway with wide outer lane (Source: *Bike Plan Hawaii Master Plan.* 2003)**

**Example of sharrow on pavement**

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Cost*** |
| | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Bike Plan Hawaii 2003 No. 62; Online Open House

# Project #31
# South Kihei Road Shoreline Erosion (near Kaonoulu Street)

## Background and Needs

Shoreline erosion in this area needs to be addressed to maintain existing roadway operations.

## Potential Solution

Reconstruct eroded portions of the road (if any) and install erosion control measures.

## Jurisdiction

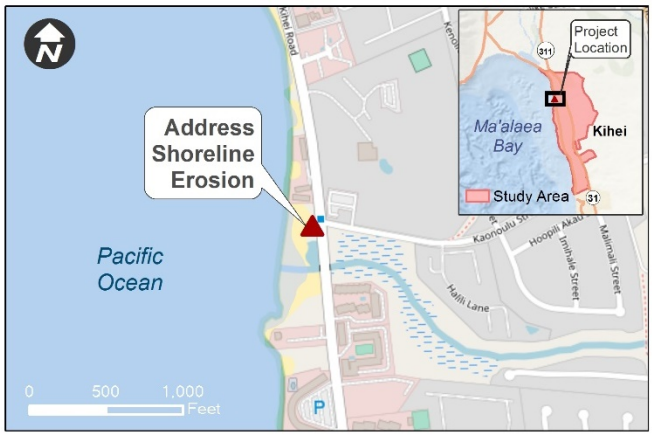
County of Maui

## Cost Estimate

$1,241,000

## Additional Right-of-way Anticipated

None anticipated




# 31 - South Kihei Road Shoreline Erosion


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***System Preservation and Resiliency*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan

# Project #32
# South Kihei Road Couplet

## Background and Needs

Additional non-motorized modal integration alternatives are needed.

## Potential Solution

A potential solution is to create two one-way streets that form a couplet. Between Uwapo Road and Kaonoulu Street, South Kihei Road could be one-way northbound and Kenolio Road could be one-way southbound. One-way travel lanes, possibly combined with reduced lane widths, would open space for pedestrian and bicycle facilities.

## Jurisdiction

County of Maui

## Cost Estimate

$3,159,000

## Additional Right-of-way Anticipated

None anticipated


*#32 - South Kihei Road Couplet*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |

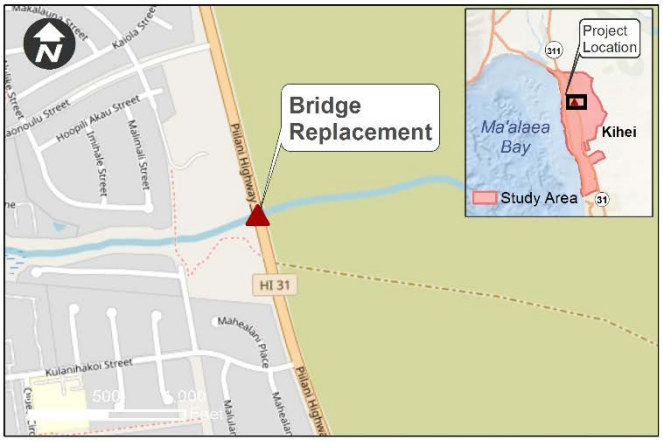
## Source

CAC; Online Open House

# Project #34
# Kulanihakoi Gulch Bridge Replacement

## Background and Needs

The Kulanihakoi Gulch Bridge, located on Piilani Highway approximately 0.2 mile north of the Kulanihakoi Street intersection, was constructed in 1980 and has a structural length of approximately 150 feet. According to the 2016 National Bridge Inventory, the bridge has a sufficiency rating of 97.3 percent, on a scale of 0 percent (poor) to 100 percent (very good). The rating is based on a formula which considers structural adequacy, functional obsolescence (compliance with design standards), and level of service provided to the public. While the bridge is above the threshold that would qualify it for federal repair funding, the bridge railings do not meet current standards for crash rating.




#34 - Kulanihakoi Gulch Bridge Replacement


## Potential Solution

Continue to monitor, inspect, and maintain the bridge. When there is sufficient diminishment in the bridge rating, rehabilitate or replace the bridge to maintain the integrity of highway operations.

## Jurisdiction

County of Maui

## Cost Estimate

$39,034,000

## Additional Right-of-way Anticipated

Undetermined

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***System Preservation and Resiliency*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; STIP FY2015-2018

# Project #35
# Waipuilani Gulch Bridge Replacement

## Background and Needs

Waipuilani Gulch Bridge is located approximately 0.15 mile north of E. Waipuilani Road and has a structural length of approximately 130 feet. The bridge was constructed in 1980 with prestressed concrete spans and a concrete cast-in-place deck. With increasing age, the bridge will require greater maintenance and corrective actions, particularly its superstructure.

## Potential Solution

Reconstruct or replace the bridge to maintain the gulch crossing as a safe and functional component of the regional transportation system.

## Jurisdiction

County of Maui

## Cost Estimate

$55,903,000

## Additional Right-of-way Anticipated

Undetermined


#35 - Waipuilani Gulch Bridge Replacement


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***System Preservation and Resiliency*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; STIP FY2015-2018

# Project #36
# South Kihei Road Intersection Improvements (between Piikea Avenue and Lipoa Street)

## Background and Needs

The intersection of South Kihei Road and the Azeka Shopping Center entrance/exit is a signalized intersection with four approaches. There have been complaints about it being difficult to pass through all three lights on South Kihei Road with the Azeka Shopping Center intersection being in the middle and in close proximity to intersections at Piikea Avenue and East Lipoa Street. The distance between the Piikea Avenue intersection and Azeka Shopping Center intersection is about 450 feet, and it is 525 feet from Azeka Shopping Center to East Lipoa Street.


**# 36 - South Kihei Road Intersection improvements**

## Potential Solution

Replace the current traffic signal at Azeka Shopping Center on South Kihei Road with a roundabout. This would allow free flow of vehicles and remove the problem resulting from three adjacent consecutive signalized intersections. Other potential solutions could be employing signal control in combination with optimized timing and coordination.


## Jurisdiction

County of Maui

## Cost Estimate

$4,494,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |

## Source

6/22/18 4th Friday; TAC; CAC; Online Open House

# Project #37
# South Kihei Road Widening (from Piikea Avenue to Lipoa Street)

## Background and Needs

The capacity of South Kihei Road needs to be increased to relieve congestion.

## Potential Solution

Widen roadway from two lanes to four (or five) lanes, with a continuous left-turn lane between Longs Drugs (Piikea Avenue) to Lipoa Street.

## Jurisdiction

County of Maui

## Cost Estimate

$7,024,000

## Additional Right-of-way Anticipated

Yes


*# 37 - South Kihei Road Widening*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Regional Capacity and Mobility*** |
| | ***Local Capacity and Congestion*** |
| | ***Land Use*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan, Long Range Land Transportation Plan, C4; Kihei Traffic Master Plan 1996

# Project #38
# South Kihei Road at Piikea Avenue, Intersection Improvements

## Background and Needs

The intersection at South Kihei Road and Piikea Avenue currently has a traffic signal but has a relatively high frequency of crashes involving vehicles and pedestrians or bicycles. At least four crashes involving non-motorized modes have occurred at this intersection since 2012.

## Potential Solution

Potential solutions could be the addition of a crosswalk on the north side of the intersection. A traffic study should be conducted to verify if the solution would increase safety for non-motorized modes. Converting the traffic signal to a roundabout may also be an option.

## Jurisdiction

County of Maui

## Cost Estimate

$1,151,000

## Additional Right-of-way Anticipated

None anticipated


**# 38 - South Kihei Road at Piikea Avenue, Intersection improvements**


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Cost*** |
| | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Preliminary analysis of crash hot spots

# Project #39
# Pedestrian Facility on Piikea Avenue

## Background and Needs

Piikea Avenue currently has sidewalks installed but has missing gaps throughout the street: approximately 0.6 mile in sidewalk gaps between South Kihei Road and Liloa Drive. Providing sidewalks to fill in existing gaps will add to the safety for pedestrians and more residents and tourist may make more trips by walking.

## Potential Solution

Construct new sidewalks on both sides of the road to fill in all existing gaps on Piikea Avenue from South Kihei Road to Liloa Drive. This will allow residents and tourists to have a continuous pedestrian facility to use instead of using roadway shoulders, bike lanes, or uneven ground.


*# 39 - Pedestrian facility on Piikea Ave*

## Jurisdiction

County of Maui

## Cost Estimate

$1,618,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Right-of-way*** |
| | ***Safety*** |

## Source

South Maui Region Parks and Open Space Master Plan; Online Open House

# Project #40
# South Kihei Road Bus Turnouts

## Background and Needs

Buses stopping on the roadway of South Kihei Road lead to backups of traffic congestion. Traffic on South Kihei Road would be able to flow if buses could pull off the roadway to load and unload passengers.

## Potential Solution

Build bus turnouts along South Kihei Road at multiple locations to allow buses to pull off the main roadway and allow other vehicles to pass.

## Jurisdiction

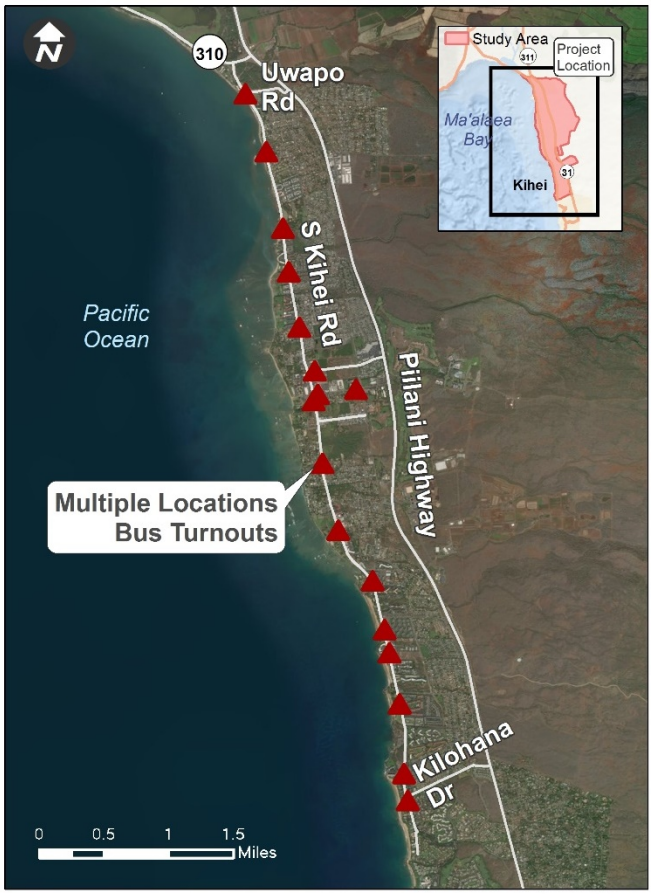
County of Maui

## Cost Estimate

$2,869,000

## Additional Right-of-way Anticipated

Yes




*#40 - South Kihei Road Bus Turnouts*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Regional Capacity and Mobility*** |
| | ***Local Capacity and Congestion*** |
| | ***Land Use*** |
| | ***Complete Streets*** |

## Source

Department of Public Works list

# Project #41
# South Kihei Road and Alanui Ke Alii Intersection Improvements

## Background and Needs

This T-intersection at South Kihei Road and Alanui Ke Alii Drive is signalized; however, traffic signals are not able to detect motorcycles at the intersection, leading to unsafe movements.

## Potential Solution

Improve intersection operation at South Kihei Road and Alanui Ke Alii by upgrading the signal equipment to better register the presence of small vehicles (motorcycles, mopeds, and bicycles) and/or relocating detector loops. Also consider the use of video detection.

## Jurisdiction

County of Maui

## Cost Estimate

$54,000

## Additional Right-of-way Anticipated

None anticipated


*# 41 South Kihei Road and Alanui Ke Alii Intersection Improvements*


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |
| | ***Cost*** |

## Source

Department of Public Works list

# Project #42
# Piilani Highway – Kihei High School Crossing

## Background and Needs

Many pedestrians will cross Piilani Highway to enter Kihei High School (under construction), which raises concerns of the potential danger of heavy foot traffic across a highway. There needs to be a way for pedestrians to cross safely.

## Potential Solution

Construct an overpass or underpass to allow pedestrians to safely cross Piilani Highway to reach Kihei High School and prevent traffic build up on the highway during peak hour.

## Jurisdiction

State of Hawaii/County of Maui

## Cost Estimate

$8,985,000

## Additional Right-of-way Anticipated

Undetermined


**# 42 - Piilani Highway - Kihei High School Crossing**


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Safety*** |
| | ***Complete Streets*** |
| | ***Regional Capacity*** |
| | ***Accessibility*** |

## Source

6/22/18 4th Friday, Online Open House

# Project #43
# Aukahi Street Extension

## Background and Needs

Roadway extension is needed to improve traffic circulation in the neighborhood. The extension will improve local mobility and provide additional evacuation routes in case of emergency.

## Potential Solution

Extend Aukahi Street to South Kihei Road (near Hale Kamaole Coop).

## Jurisdiction

County of Maui

## Cost Estimate

$32,667,000

## Additional Right-of-way Anticipated

Yes


*# 43 - Aukahi Road Extension*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Land Use*** |
| | ***System Preservation and Resiliency*** |
| | ***Local Capacity*** |

## Source

TAC

# Project #44
# Old Welakahao Road Extension to Piilani Highway

## Background and Needs

Residents between Welakahao Road and Kanani Road lack surface street connections for emergency evacuations. At present, the roadway network requires many households to first head *makai* before reaching a road with direct access to Piilani Highway. When coastal areas are affected by natural disasters, *mauka* evacuation routes are needed.

## Potential Solution

To address the relatively long stretch between Piilani Highway access points at E. Welakahao Road and Kanani Road, construct a connecting route from Kupuna Street to Liloa Drive and connect Old Welakahao Road to Piilani Highway (opposite the access road for the Kihei Wastewater Treatment Plant).

## Jurisdiction

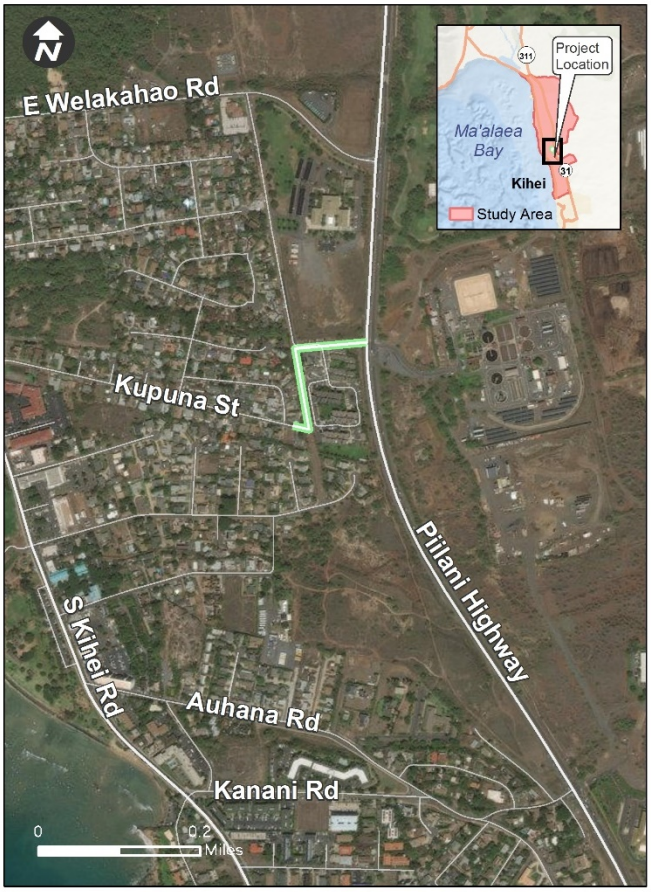
County of Maui

## Cost Estimate

$6,547,000

## Additional Right-of-way Anticipated

None anticipated




*#44 - Welakahao Rd and Kanani Rd*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Land Use*** |
| | ***Safety*** |
| | ***Local Capacity*** |

## Source

6/22/18 4th Friday

# Project #46
# Piilani Highway Bike Path

## Background and Needs
Construction of a bikeway network is needed.

## Potential Solution
Construct bike path on both sides of Piilani Highway.

## Jurisdiction
State of Hawaii

## Cost Estimate
$12,015,000

## Additional Right-of-way Anticipated
Yes


*#46 - Piilani Highway Bike Path*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source
Kihei-Makena Community Plan 1998; Online Open House

# Project #47
# Piilani Highway Landscaped Buffer

## Background and Needs

Mitigation of highway noise and reduction of visual impacts of development are needed on Piilani Highway. Vehicles traveling on Piilani Highway have speed limits of 45 and 55 miles per hour. Piilani Highway is also one of the few major north-south routes used for traveling. A combination of busy vehicular traffic and fast speeds will cause high levels of noise and visual impacts.

## Potential Solution

Provide a landscape buffer on both sides of Piilani Highway where adjacent to residential development. Add a highway median except at bridges. Landscaped buffers will absorb some of the noise created by bus traffic and add an aesthetically pleasing visual impact.

## Jurisdiction

State of Hawaii

## Cost Estimate

$1,689,000

## Additional Right-of-way Anticipated

None anticipated


*#47 - Piilani Highway Landscape Buffer*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Natural Environment*** |

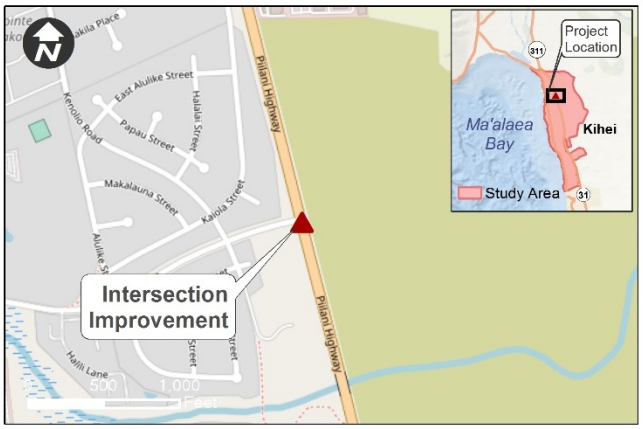
## Source

Kihei-Makena Community Plan 1998

# Project #48
# Piilani Highway and Kaonoulu Street Intersection Improvements

## Background and Needs

The T-intersection at Piilani Highway and Kaonoulu Street is currently stop-controlled, with one stop sign on Kaonoulu Street. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection.




#48 - Piilani Highway and Kaonoulu Street Intersection Improvements

## Potential Solution

Construct a new traffic signal. A new traffic signal would increase the movement capacity through the intersection, especially for vehicles using Kaonoulu Street turning into Piilani Highway.


## Jurisdiction

State of Hawaii

## Cost Estimate

$1,800,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Kihei Traffic Master Plan 2005; Online Open House

# Project #49
# Piilani Highway and Waipuilani Road Intersection Improvements

## Background and Needs

The T-intersection at Piilani Highway and Waipuilani Road is currently stop-controlled, with one stop sign on Waipuilani Road. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. With the peak hour volume of approximately 120 vehicles going Eastbound of Hou Street on Waipuilani Road, cars can quickly build up in Waipuilani Road if Piilani Highway has a consistent flow of traffic. Waipuilani Road is a right-in and right-out intersection, which means vehicles turning into Piilani Highway from Waipuilani Road can only travel southbound and only vehicles traveling southbound on Piilani Highway can turn into Waipuilani Road.


#49 - Piilani Highway and Waipuilani Road Intersection Improvement


## Potential Solution

Construct a new traffic signal. A new traffic signal would increase the movement capacity through the intersection, especially for vehicles using Waipuilani turning into Piilani Highway. With a traffic signal control, vehicles will have the safety and accessibility to make a left or right turn in the intersection.

## Jurisdiction

State of Hawaii

## Cost Estimate

$1,800,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Right-of-way*** | ***Safety*** |
| ***Land Use*** | |

## Source

Kihei Traffic Master Plan 2005; Online Open House

# Project #50
# Piilani Highway and Welakahao Road Intersection Improvements

## Background and Needs

The T-intersection at Piilani Highway and Welakahao Road is currently stop-controlled, with one stop sign on Welakahao Road. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. Currently, only the right-turn movement is allowed from Welakahao Road to Piilani Highway.


#50 - Piilani Highway and Welakahao Road Intersection Improvements

## Potential Solution

Construct a new traffic signal. A new traffic signal would increase the movement capacity through the intersection, especially for vehicles using Welakahao Road turning into Piilani Highway.


## Jurisdiction

State of Hawaii

## Cost Estimate

$1,800,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Kihei Traffic Master Plan 2005; Online Open House

# Project #51
# Piilani Highway and Kulanihakoi Intersection Improvements

## Background and Needs

The T-intersection at Piilani Highway and Kulanihakoi Street is currently stop-controlled, with one stop sign on Kulanihakoi Street. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. With the peak hour volume of approximately 100 vehicles going Eastbound of Oluea Street on Kulanihakoi Street, cars can quickly build up in Kulanihakoi Street if Piilani Highway has a consistent flow of traffic.


#51 - Piilani Highway and Kulanihakoi Intersection Improvements

## Potential Solution

Construct a new traffic signal. A new traffic signal would increase the movement capacity through the intersection, especially for vehicles using Kulanihakoi Street turning into Piilani Highway.


## Jurisdiction

State of Hawaii

## Cost Estimate

$1,800,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

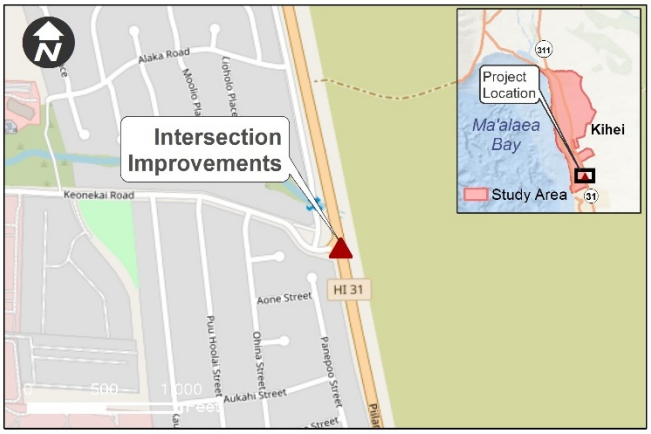
## Source

Kihei Traffic Master Plan 1996; Online Open House

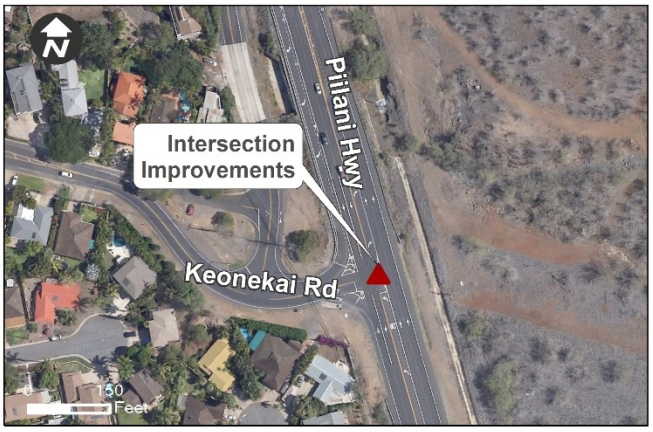
# Project #52
# Piilani Highway and Keonekai Intersection Improvements

## Background and Needs

The T-intersection at Piilani Highway and Keonekai Road is currently stop-controlled, with one stop sign on Keonekai Road. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. With the peak hour volume of approximately 150 vehicles going Eastbound of Alaku Place on Keonekai Road, cars can quickly build up in Keonekai Road if Piilani Highway has a consistent flow of traffic.




# 52 - Piilani Highway and Keonekai Intersection Improvements




## Potential Solution

Construct a new traffic signal. A new traffic signal would increase the movement capacity through the intersection, especially for vehicles using Keonekai Road turning into Piilani Highway.

## Jurisdiction

State of Hawaii

## Cost Estimate

$1,800,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Kihei Traffic Master Plan 1996; Online Open House

# Project #53
# Piilani Highway at Moi Place Intersection

## Background and Needs

Pedestrian safety measures are needed for the crossing facility at the Piilani Highway and Moi Place intersection. There needs to be advance signing alerting drivers that an upcoming crossing facility is ahead.

## Potential Solution

Install advance signing and advance stop bars to warn drivers of the potential presence of pedestrians and possibility of a speed hump before the right-turn crosswalk.

## Jurisdiction

State of Hawaii

## Cost Estimate

$12,000

## Additional Right-of-way Anticipated

None anticipated


#53 - Piilani Highway, at Moi Place intersection improvement


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |
| | ***Complete Streets*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Statewide Pedestrian Master Plan draft 2011 MS; Online Open House

# Project #54
# Piilani Highway (pinch location at gulch bridge north of E Welakahao Road)

## Background and Needs

Shoulders widths on Piilani Highway generally range from 6 to 8 feet. However, shoulders narrow to minimal widths at some bridge locations, including Keokea Gulch Bridge, located north of East Welakahao Road. Share the Road signs are posted on the approaches to alert motorists to bicyclists who may be in the travel lane. Given high travel speeds on Piilani Highway (posted speed limit of 40 miles per hour), improvements at this pinch point are needed to increase the safety and comfort of bicyclists.


#54 - Piilani Highway - (pinch location at gulch bridge north of E Welakahao Road)

## Potential Solution

Widen shoulders to 4 feet on the gulch bridge for bicycle use or construct bicycle bridges that are attached or adjacent to the vehicular bridge.

## Jurisdiction

State of Hawaii

## Cost Estimate

$4,317,000

## Additional Right-of-way Anticipated

Yes


***Pinch location at Keokea Gulch Bridge on Piilani Highway south bound (Source: Google Maps)***

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |
| | ***Safety*** |

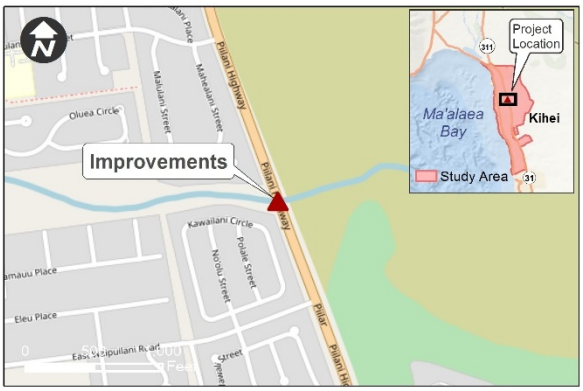
## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan

# Project #55
# Piilani Highway (pinch location at gulch bridge north of E Waipuilani Road)

## Background and Needs

Shoulders widths on Piilani Highway generally range from 6 to 8 feet. However, shoulders narrow to minimal widths at some bridge locations, including Waipuilani Gulch Bridge, located north of East Waipuilani Road. Share the Road signs are posted on the approaches to alert motorists to bicyclists who may be in the travel lane. Given high travel speeds on Piilani Highway (posted speed limit of 40 miles per hour), improvements at this pinch point are needed to increase the safety and comfort of bicyclists.




#55 - Piilani Highway - (pinch location at gulch bridge north of E Waipuilani Road)

## Potential Solution

Widen shoulders to 4 feet on the gulch bridge for bicycle use or construct bicycle bridges that are attached or adjacent to the vehicular bridge.


## Jurisdiction

State of Hawaii

## Cost Estimate

$9,353,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |
| | ***Safety*** |

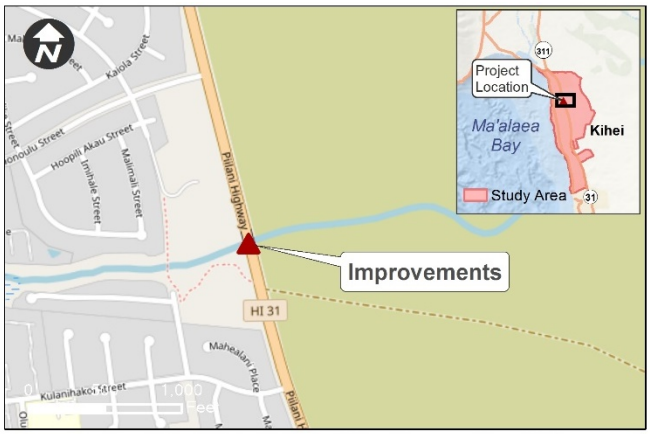
## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan

# Project #56
# Piilani Highway (pinch location at gulch bridge north of Kulanihakoi Street)

## Background and Needs

Shoulders widths on Piilani Highway generally range from 6 to 8 feet. However, shoulders narrow to minimal widths at some bridge locations, including Kulanihakoi Gulch Bridge, located north of Kulanihakoi Street. Share the Road signs are posted on the approaches to alert motorists to bicyclists who may be in the travel lane. Given high travel speeds on Piilani Highway (posted speed limit of 40 miles per hour), improvements at this pinch point are needed to increase the safety and comfort of bicyclists.




**# 56 - Piilani Highway - (pinch location at gulch bridge north of Kulanihakoi Street)**

## Potential Solution

Widen shoulders to 4 feet on the gulch bridge for bicycle use or construct bicycle bridges that are attached or adjacent to the vehicular bridge.


## Jurisdiction

State of Hawaii

## Cost Estimate

$10,790,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan

# Project #57
# Piilani Highway and Piikea Avenue Intersection Improvements

## Background and Needs

A longer green light on Piikea Avenue is needed for cars wanting to turn left onto Piilani Highway. The short left-turn signal causes cars in Piikea Avenue to back up, with a long queue.

## Potential Solution

Optimize signals at the Piilani Highway and Piikea Avenue intersection to allow a longer green left-turn signal for vehicles turning left onto Piilani Highway from Piikea Avenue. Another consideration is the addition of a second left-turn lane from Piikea Avenue to Piilani Highway. A traffic study of the intersection should be conducted to determine the optimum solution.

## Jurisdiction

State of Hawaii/County of Maui

## Cost Estimate

$508,000 - $759,000

## Additional Right-of-way Anticipated

None anticipated


# 57 - Piilani Highway and Piikea Intersection Improvement


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Local Capacity*** |

## Source

Department of Public Works list; Online Open House

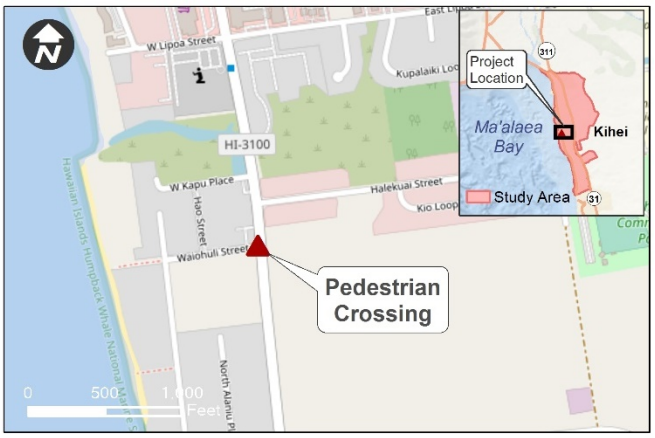
# Project #58
# South Kihei and Waiohuli Street Intersection Improvements

## Background and Needs

The T-intersection at South Kihei Road and Waiohuli Street is currently stop-controlled, with one stop sign on Waiohuli Street. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection, making it difficult to make left turns onto South Kihei Road from Waiohuli Street.

## Potential Solution

The intersection operation can be improved by providing by constructing a new traffic signal, roundabout or other intersection improvement. A new traffic signal or roundabout would increase the movement capacity through the intersection especially for vehicles using Waiohuli Street turning into South Kihei Road. Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.




**#58 - Pedestrian Crossing at Wetlands adjacent to Halekuai Street and Waiohuli Street**


## Jurisdiction

County of Maui

## Cost Estimate

$1,800,000 - $4,500,000

## Additional Right-of-way Anticipated

None anticipated.

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Right-of-way*** | ***Cultural Resources*** |
| ***Land Use*** | ***Safety*** |
| ***Natural Environment*** | |

## Source

KCA; Kihei Makena Roadway and Drainage Guidelines

# Project #59
# East Welakahao Road Sign Shared Roadway (South Kihei Road to Piilani Highway)

## Background and Needs

East Welakahao Road is a 2-lane roadway separated by a double yellow line with residential areas south of the road and undeveloped land on the north side. Since East Welakahao Road is one of the few roads that connects South Kihei Road and Piilani Highway, East Welakahao Road needs to be adapted to allow multi-modal transportation. It is important to have non-motorized accessible routes to both South Kihei Road and Piilani Highway as the major roadways traveling north and south.


*# 59 - East Welakahao Road Sign Shared Roadway*

## Potential Solution

Construct a signed shared roadway along East Welakahao Road between South Kihei Road and Piilani Highway. The signed shared roadway will have new roadway striping and painting for non-motorized transportation and new signs to reflect the new multi-modal use of the roadway. Striping and signs will be used to grant access and safety for non-motorized vehicles.

## Jurisdiction

County of Maui

## Cost Estimate

$179,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Complete Streets*** | ***Right-of-way*** |
| ***Cost*** | ***Land Use*** |

## Source

Federal-Aid Highways 2035 Long Range Land Transportation Plan; Bike Plan Hawaii 2003 No. 57

# Project #60
# Auhana Road, Charlie Young Drainage District

## Background and Needs

The drainage system of the Charlie Young District includes a combination of underground drain lines and surface channels. In places, stormwater sheet-flows over land and intense storm events can result in flooding on South Kihei Road at the downstream end.

## Potential Solution

Upstream improvements to increase capacity are expected to help reduce flooding at South Kihei Road. Among the proposed improvements is replacement of an inadequate 60-inch culvert at Auhana Road with two 7-foot by 5-foot box culverts.

## Jurisdiction

County of Maui

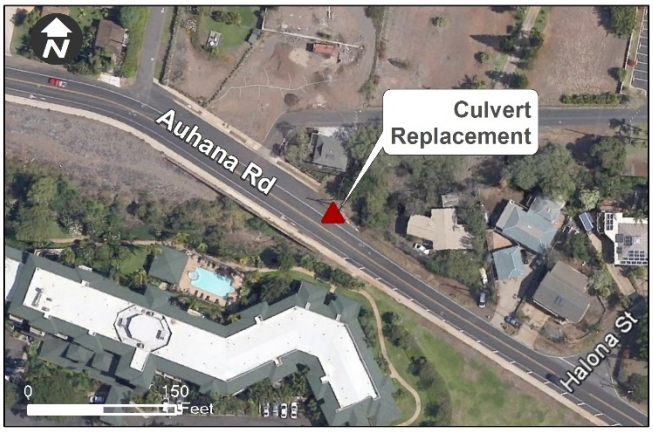
## Cost Estimate

$158,000

## Additional Right-of-way Anticipated

None anticipated


# 60 - Auhana Road, Charlie Young Drainage District




## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***System Preservation and Resiliency*** |
| | ***Cost*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |

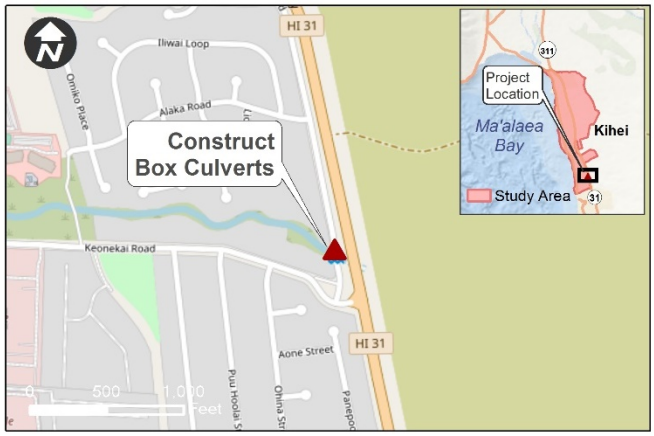
## Source

Kihei Drainage Master Plan 2016

# Project #61
# Kanakanui Road, Liilioholo Drainage District

## Background and Needs

With increased development and rapid population growth in Kihei, storm water conveyance and drainage improvements are needed to mitigate potential flood risks in the area. The 2016 Kihei Drainage Master Plan assessed existing drainage conditions of the Kihei District, which included identifying existing drainage structures and outlets, and evaluating how storm water flows are routed through the existing structures. Proposed improvements were recommended based on the existing outlet conditions, as well as based on future development projects planned and their potential impacts on drainage patterns and capacity in the area.




# 61 - Kanakanui Road, Liilioholo Drainage District


Liilioholo Drainage District is one of the eight drainage districts that were evaluated in the Plan and includes the area *makai* of Piilani Highway, with the northern boundary located just past the Maui Banyan on South Kihei Road and the southern boundary past the South Kihei Road and Alakoa Street intersection. Liilioholo Gulch is one of the main drainageways in the area, providing drainage pathways for storm water runoff from areas *mauka* and *makai* of Piilani Highway. Before it reaches its outlet at Kamaole Beach Park II past South Kihei Road, the gulch intersects with existing roadways at several locations, including the crossing with Kanakanui Road. Based on the Kihei Drainage Master Plan, the 100-year storm water surface elevation at this existing concrete ford crossing is approximately 5.5 feet above the road. Drainage improvements are needed at this crossing to provide sufficient drainage capacity for future conditions and to prevent overflow from the gulch.

## Potential Solution

Construct box culverts at the existing Kanakanui Road concrete ford crossing to provide additional drainage capacity and prevent overflow during high flow conditions. This would involve reconstruction of Kanakanui Road and would require further study to assess the feasibility.

## Jurisdiction

County of Maui

## Cost Estimate

$733,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
|  | ***System Preservation and Resiliency*** |
|   | ***Right-of-way*** |
|  | ***Land Use*** |

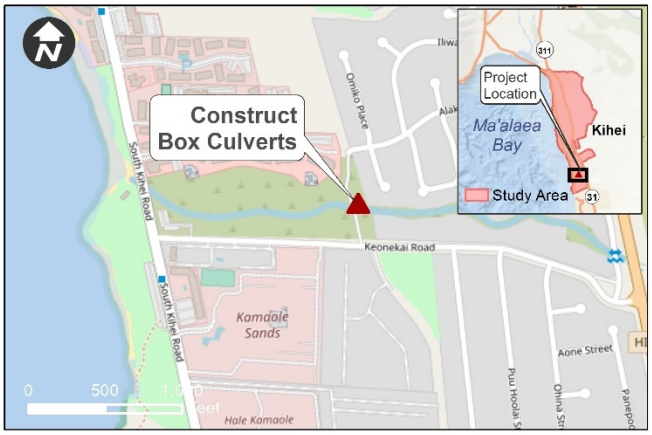
## Source

Kihei Drainage Master Plan 2016

# Project #62
# North-South Road, Liilioholo Drainage District

## Background and Needs

This project was also identified in the 2016 Kihei Drainage Master Plan, which included assessment of existing drainage conditions and recommendations to improve drainage capacity in the Kihei District under forecasted future conditions (see Project #60). As with Project #60, drainage improvements are needed at the crossing of Liilioholo Gulch with the North-South Collector Extension (Liloa Drive) to provide sufficient drainage capacity for future conditions and to prevent overflow from the gulch.




**# 62 - North-South Road, Liilioholo Drainage District**

## Potential Solution

Construct box culverts at the existing North-South Collector Extension (Liloa Drive) concrete ford crossing to provide additional drainage capacity and prevent overflow from Liilioholo Gulch during high flow conditions. This would require (1) regrading the existing channel upstream and downstream of the ford crossing to provide a positive flow direction, (2) raising the road elevation, or (3) a combination of both.


## Jurisdiction

County of Maui

## Cost Estimate

$644,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***System Preservation and Resiliency*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |

## Source

Kihei Drainage Master Plan 2016

# Project #63
# Kihei Entryways

## Background and Needs

The Kihei entry way areas need to be enhanced with a sense of place for resident and visitors. Additional greenery, parks, or monuments would create a more aesthetically pleasing visual for residents and visitors traveling through Kihei.

## Potential Solution

Provide an aesthetic landscaped entryway and pocket green space at the north end of Kihei, north of the future commercial area. Provide a similar Kihei entryway at Piikea Avenue.

## Jurisdiction

County of Maui

## Cost Estimate

$558,000

## Additional Right-of-way Anticipated

None anticipated


*#63 - Kihei Entryways*

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Economic Vitality*** |

## Source

Kihei-Makena Community Plan 1998

# Project #64
# Multi-use Path on the *Makai* Side of the North-South Collector (Liloa Street)

## Background and Needs

Non-motorized access and connectivity is needed in the area. The multi-use path is partially completed from East Lipoa Street to Halekuai Street. The segment from Halekuai Street to East Welakahao Road is not yet constructed.


*# 64 - Multi-use path on the makai side of the North-South Collector (Liloa Street)*

## Potential Solution

The multi-use path is included in extension of the North-South Collector Road from Halekuai Street south to East Welakahao Road. However, in light of recent completion of the gym at Kihei District Park, a potential solution to increasing connectivity for non-motorized modes is to proceed with the multi-use path in advance of the North-South Road as a whole (i.e., phased implementation). This project was identified as Sub-Priority Route One in Multi-use Paths in the *South Maui Region Parks and Open Space Master Plan*.

## Jurisdiction

County of Maui

## Cost Estimate

$2,022,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Safety*** |

## Source

South Maui Region Parks and Open Space Master Plan

# Project #65
# Multi-use Path in Southern Section of Kihei

## Background and Needs

The street grid is less pronounced in the southern portion of Kihei, where newer residential development is based on a more curvilinear street pattern. Interspersed are larger hotel and condominium developments (often with a *mauka-makai* orientation) that require traveling around as through access is deterred. Consequently, an expanded network of non-motorized access and connectivity is needed in the area.

## Potential Solution

Route a multi-use path across the top of Maui Kamaole, Maui Hill, Keawekapu Views, and Kilohanan Mauka subdivisions. Further study and community engagement is needed to establish an alignment that makes these linkages. However, given existing development, the corridor should be as direct as possible and have a width of approximately 15 feet. This project was identified as Sub-priority Route Two in Multi-use Paths in the *South Maui Region Parks and Open Space Master Plan*.


*#65 - Multi-use path in southern section of Kihei*

## Jurisdiction

County of Maui

## Cost Estimate

$3,676,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Safety*** |

## Source

South Maui Region Parks and Open Space Master Plan

# Project #66
# Pedestrian Facility on Old Kapu Road

## Background and Needs

Development of the new gym in Kihei District Park has created an opportunity to increase connectivity between a major gathering place and the surrounding community. A new *mauka-makai* multi-use facility in the vicinity of Old Kapu Road would connect to the Kihei Greenway and serve a broad demographic for both transportation and recreation purposes.


*# 66 - Pedestrian Facility on Kapu Road*

## Potential Solution

Construct a multi-use facility connecting Liloa Drive and South Kihei Road along Old Kapu Road. This project was identified as Sub-priority Route Two in the *South Maui Region Parks and Open Space Master Plan*.

## Jurisdiction

County of Maui

## Cost Estimate

$1,268,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Safety*** |
| | ***Complete Streets*** |
| | ***Land Use*** |

## Source

South Maui Region Parks and Open Space Master Plan

# Project #67
# Parking for Waipuilani Park

## Background and Needs

Additional parking is needed for Waipuilani Park because the park is commonly used by both residents of and visitors to Kihei. Adding additional spots will address the insufficient parking problem if visitation to the park continues to increase.

## Potential Solution

Provide additional street parking for park users. Investigate whether the roadside can be cleared and parking spaces designated so that users can park on the street.


#67 - Parking for Waipuilani Park


## Jurisdiction

County of Maui

## Cost Estimate

$18,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Cost*** |
| ROW | ***Right-of-way*** |
| | ***Natural Environment*** |
| | ***Cultural Resources*** |
| | ***Economic Vitality*** |

## Source

Department of Public Works list

# Project #69
# Piilani Highway Sidewalk between Piikea Avenue and Lipoa Street

## Background and Needs

Pedestrian facility is needed to connect the new charter school campus with the closest public bus stop (at Piilani Shopping Village). Piilani Highway currently has no sidewalks installed throughout the street. Piilani Highway needs approximately 1,000 feet of sidewalk between Lipoa Street and Piikea Avenue on *makai* side. Providing sidewalks will add to the safety for pedestrians and more residents that commonly access the new charter school campus.


*# 69 - Piilani Hwy Sidewalk between Piikea Ave and Lipoa Street*

## Potential Solution

Constructing new sidewalks on Piilani Highway on the *makai* side from Lipoa Street to Piikea Avenue. This will allow residents to have a pedestrian facility to use instead of using roadway shoulders.

## Jurisdiction

State of Hawaii

## Cost Estimate

$687,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Cost*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

CAC

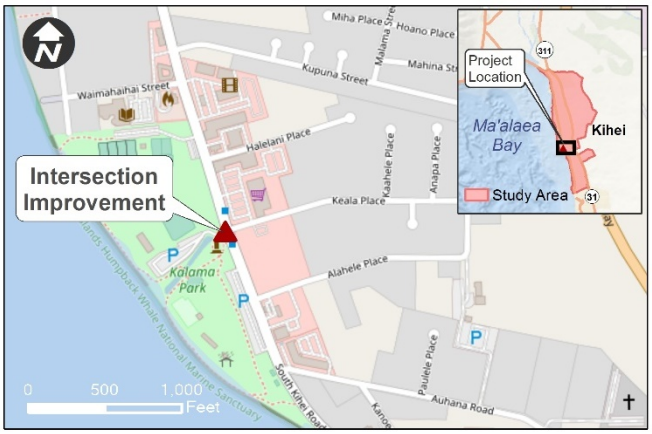
# Project #70
# South Kihei Road at Keala Place, Intersection Improvements

## Background and Needs

The intersection at South Kihei Road and Keala Place currently has traffic signals but has relatively high frequency of crashes involving vehicles and pedestrians or bicycles. At least four crashes involving non-motorized modes have occurred at this intersection since 2012.

## Potential Solution

Conduct a study to investigate replacing the current traffic signal with a roundabout. A new roundabout may decrease potential conflicts between vehicles and pedestrians as they travel through this intersection. Roundabouts create an environment where vehicles will travel at slower speeds, which may lead to fewer collisions with other vehicles and non-motorized modes.




#70 - South Kihei Road at Keala Place, Intersection improvements


## Jurisdiction

County of Maui

## Cost Estimate

$4,494,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Preliminary analysis of crash hot spots

# Project #71
# South Kihei Road at Alahele Place, Intersection Improvements

## Background and Needs

The T-intersection at South Kihei Road and Alahele Place is currently stop-controlled, with one stop sign on Alahele Place. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection. This intersection also has a relatively high frequency of crashes involving vehicles and pedestrians or bicycles. At least four crashes involving non-motorized modes have occurred at this intersection since 2012.


#71 - South Kihei Road at Alahele Place, Intersection improvements

## Potential Solution

Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.


## Jurisdiction

County of Maui

## Cost Estimate

$4,494,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Preliminary analysis of crash hot spots

# Project #72
# Kihei Islander #10 Improvements (Piikea Bus Stops)

## Background and Needs

There is a hub for bus service in the Piilani Village Shopping Center that requires buses to move through the parking lot of the busy shopping center. While there is an element of convenience for bus riders who are patronizing businesses in the shopping center, bus operations are affected by congestion and space limitations.


# 72 - Kihei Islander #10 Improvements


## Potential Solution

Construct two new bus stops on both sides of Piikea Avenue. These new stops will be provided by the developer of the adjacent property *makai* of Liloa Drive.

Add new bus stops to Piikea Avenue *mauka* of Liloa Drive to serve the Piilani Shopping Center. These stops would accommodate two buses at a time. This will require a minor route alignment change. The route would continue on Piikea Ave to right onto Piilani Highway to right onto East Lipoa Street to continue its alignment.

## Jurisdiction

County of Maui

## Cost Estimate

$641,000 (Infrastructure improvements; does not include operational changes)

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Transit*** | ***Accessibility*** |
| ***Land Use*** | ***Complete Streets*** |

## Source

Maui DOT Short Range Transit Plan

# Project #73
# Kihei Islander #10 Improvements (South Kihei Bus Stop)

## Background and Needs

Coverage and frequency of bus routes need to be increased on South Kihei Road. Current bus stop locations are separated by far distances and a mid-point stop is needed for transit convenience.

## Potential Solution

Add new bus stops on South Kihei Road at Leilani Road, which is the midpoint between current stops located 0.5 mile apart at Uwapo Road and Ohukai Road.

## Jurisdiction

County of Maui

## Cost Estimate

$250,000

## Additional Right-of-way Anticipated

Yes


**# 73 - Kihei Islander #10 Improvements**


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Transit*** |
| | ***Right-of-way*** |
| | ***Natural Environment*** |
| | ***Accessibility*** |
| | ***Complete Streets*** |

## Source

Maui DOT Short Range Transit Plan; Online Open House

# Project #74
# Kihei Islander #10 Improvements (Bus Services)

## Background and Needs

Coverage and frequency of bus routes need to be increased throughout Kihei. More service vehicles and service times need to be added to manage current and rising demand for buses. An express service bus should be added as well to help with the coverage and frequency issues.

## Potential Solution

Revise service characteristics to include span of service from 5:30 a.m. to 11 p.m., with headways 60-minute AM peak, mid-day, PM peak, and evening and 90-minute later evening; 17 additional trips; and 2 vehicles. Express services will include 6 trips operated with 1 additional vehicle: 3 trips in the AM peak period and 3 trips in the PM peak period will provide additional capacity.

## Jurisdiction

County of Maui

## Cost Estimate

$2,000,000

## Additional Right-of-way Anticipated

None anticipated


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Transit*** | ***Accessibility*** |
| ***Right-of-way*** | ***Complete Streets*** |
| ***Natural Environment*** | |

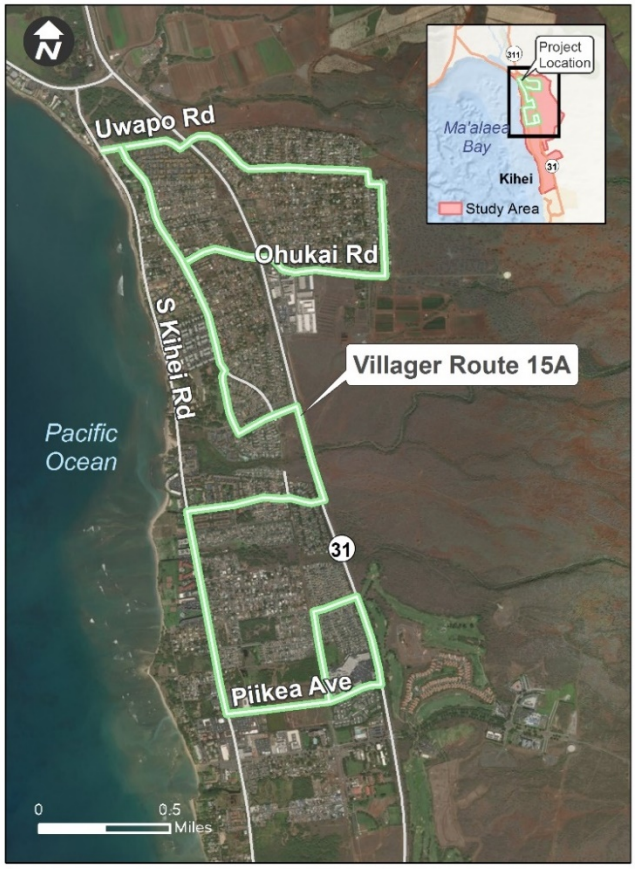
## Source

Maui DOT Short Range Transit Plan; Online Open House

# Project #75
# North Kihei Villager Route 15A

## Project Description

The North Kihei Villager will operate from Maalaea Harbor as the current Kihei Villager does today. The route will serve the residential area *mauka* of Piilani Highway. The route would turn right onto Ohukai Road and left onto Kenolio Road. From Kenolio Road, the route turns left onto Kaonoulu Street to Piilani Highway, where the route turns right onto Kulanihakoi Street to South Kihei Road, then continues onto Piikea Avenue. The route returns to Maalaea Harbor via Liloa Drive, to return to Piikea Avenue serving the Piilani Shopping Center from an on-street bus stop.




*#75 - North Kihei Villager Route 15A*

## Potential Solution

Implement an alternate alignment as shown for the North Kihei Villager Route 15A. This alignment would have the route travel along Kenolio Road instead of traveling to the residential area *mauka* of Piilani Highway. This could be an interim alignment prior to providing the full-service change if it is determined the full change would take longer than 1 year to implement. Upon implementing the full-service change to *mauka* of Piilani Highway, the Kihei Islander could provide service along Kenolio Road if demand is warranted. Characteristics of the bus route include:

- Span of Service: 5:30 a.m. to 9 p.m.
- Headways: 60-minute AM peak, mid-day, PM peak, and evening
- Number of Trips: 16
- Number of Vehicles: 1

## Jurisdiction

County of Maui

## Cost Estimate

$500,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Transit*** | ***Cultural Resources*** |
| ***Right-of-way*** | ***Accessibility*** |
| ***Natural Environment*** | |

## Source

Maui DOT Short Range Transit Plan; Online Open House

# Project #76
# South Kihei Villager Route 15B

## Project Description

The South Kihei Villager is designed to connect with the North Kihei Villager and the Islander along Piikea Avenue. Initially, the route would turn around via East Lipoa Street, Liloa Drive, and Piikea Avenue. When demand warrants, the South Kihei Villager would continue on Piikea Avenue to Piilani Highway to Lipoa Drive to serve the Maui Tech Park. This segment is shown in the dashed line on the map. This new route would provide new service to residential areas along East and West Welakahao Road, Auhana Road, Alanui Kealii, Kauhale Street, and Akala Drive. The route would terminate at the current end point of the Kihei Islander at Wailea Iki Drive.


*#76 - South Kihei Villager Route 15B*

## Potential Solution

Implement this route by adding 37 new bus stops along the main alignment and 3 bus stops along the extension. Initially, these stops would be minimal: route sign and schedule. As service develops, shelters would be added. The addition of the South Kihei Villager would allow the Kihei Islander to provide additional express services to the Piilani Shopping Center, allowing continuing passengers to transfer to the Villager routes. The express services would terminate at the Piilani Shopping Center. Passengers wanting to continue their trip further south would transfer to the South Kihei Villager. Three additional morning and three afternoon peak period trips would be added to provide additional passenger capacity. Route characteristics include the following:

- Span of Service: 5:30 a.m. to 9 p.m.
- Headways: 60 minutes during AM peak, mid-day, PM peak, and evening
- Number of Trips: 16
- Number of Vehicles: 1

## Jurisdiction

County of Maui

## Cost Estimate

$500,000 - $7,000,000 (high end cost estimate to fully furnish 37 bus stops)

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Transit*** | ***Accessibility*** |
| ***Right-of-way*** | ***Complete Streets*** |
| ***Natural Environment*** | |

## Source

Maui DOT Short Range Transit Plan

# Project #77
# *Mauka-makai* Bus Route on Lipoa Street/Lipoa Parkway

## Background and Needs

Maui Tech Park is a large employment center and the site of the consolidated Kihei Charter School. It is a major travel destination, but bus transit service is not currently available. Future bus service to the Tech Park is included as an extension of proposed South Kihei Villager Route 15B (see Project #76). Bus service to the Tech Park may be warranted independent of Route 15B, given the emergence of Lipoa as a well-traveled *mauka-makai* route, the relatively compact form of the tech park, the clustering of land uses with regular patterns of activity, and a population of older schoolchildren who do not have access to their own vehicles.


*# 77 - Mauka-makai bus route on Lipoa St/Lipoa Parkway*

## Potential Solution

Implement a new *mauka-makai* bus route between South Kihei Road and the Maui Tech Park to expand transportation choices and increase access to destinations such as Kihei Community Center and Aquatic Center, Kihei Regional Park, Lokelani Intermediate School, Kihei Charter School, and Maui Tech Park businesses.

## Jurisdiction

County of Maui

## Cost Estimate

$500,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Transit*** | ***Accessibility*** |
| ***Natural Environment*** | ***Complete Streets*** |

## Source

CAC; Online Open House

# Project #78
# Kai Makani and South Kihei Road Crossing

## Background and Needs

There is an existing crosswalk near Kai Makani Beach Villas across from Mai Poina Beach Park. Nevertheless, pedestrians who wish to cross South Kihei Road may find it difficult, particularly when there is no break in cars traveling on South Kihei Road. With no adjacent traffic signal or speed control devices, free flowing traffic on South Kihei Road means that vehicles are traveling at a speed limit of 30 miles per hour.


# 78 - Kai Makani and South Kihei Road Crossing


## Potential Solution

To increase pedestrian safety, install an RRFB at the existing crossing facility near Kai Makani. The new RRFB will enhance warning of the crossing location.

## Jurisdiction

County of Maui

## Cost Estimate

$31,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ***Cost*** | ***Natural Environment*** |
| ***Right-of-way*** | ***Cultural Resources*** |
| ***Land Use*** | ***Safety*** |

## Source

Online Open House

# Project #79
# Keala Place Sidewalk

## Background and Needs

Keala Place currently has sidewalks installed but has missing gaps throughout the street. Keala Place has approximately 1,000 feet in sidewalk gaps between South Kihei Road and Liloa Drive. Providing sidewalks to fill in existing gaps will add to pedestrian safety and may lead to more residents and tourists making trips on foot.

## Potential Solution

Construct new sidewalks to fill in all existing gaps on Keala Place from South Kihei Road to Liloa Drive. This will allow residents and tourists to have a pedestrian facility to use instead of using roadway shoulders, bike lanes, or uneven ground.


*# 79 - Keala Place Sidewalk*

## Jurisdiction

County of Maui

## Cost Estimate

$855,000

## Additional Right-of-way Anticipated

Yes

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Complete Streets*** |
| | ***Land Use*** |
| | ***Accessibility*** |
| | ***Safety*** |

## Source

Online Open House

# Project #80
# Piilani Highway and North Kihei Road Left Turn

## Background and Needs

The traffic signal intersection on Piilani Highway and North Kihei Road currently has a problem with not detecting bikers making left turns. Because bikers making a left turn on Piilani Highway onto North Kihei Road are not detected, bikers are in danger from motorized vehicles.

## Potential Solution

Existing traffic signal to be modified to detect bikers on Piilani Highway left turn into North Kihei Road. The modified traffic signal will create a safer intersection and reduce the amount of crashes between motorized and non-motorized vehicles.

## Jurisdiction

State of Hawaii

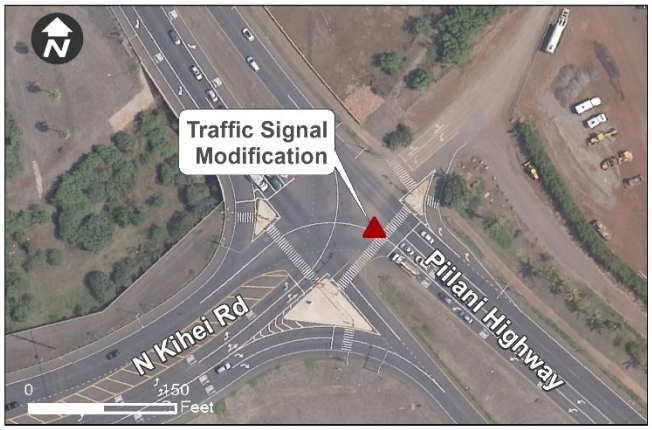
## Cost Estimate

$383,000

## Additional Right-of-way Anticipated

None anticipated


# 80 - Piilani Highway and North Kihei Road Left Turn




## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Cost*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Online Open House

# Project #81
# E Lipoa Official Bus Stop near Kupalaiki Loop

## Background and Needs

The bus stop on East Lipoa Street near Kupalaiki Loop is currently unfurnished, with nothing but a bus stop sign. Pedestrians waiting for the bus stand on the sidewalks, which could inconvenience other pedestrians. For adequate spacing, a new bus stop location might be needed to establish a fully furnished facility.

## Potential Solution

Construct a bus stop on East Lipoa Street near Kupalaiki Loop with a shelter, benches, and other necessary elements.


#81 - E Lipoa official bus stop near Kupalaiki Loop


## Jurisdiction

County of Maui

## Cost Estimate

$250,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Cost*** |
| | ***Right-of-way*** |
| | ***Transit*** |
| | ***Complete Streets*** |

## Source

Online Open House

# Project #82
# Kulanihakoi Speed Humps

## Background and Needs

There are concerns of consistent speeding occurring on Kulanihakoi Street. Even with designated crosswalks and crossing signs, pedestrians are still concerned about the speeding issue in this area. Kulanihakoi Street is one of the few streets that connect South Kihei Road and Piilani Highway, which makes the street regularly used. Along with the fact that Kulanihakoi Street is surrounded by residential housing and regular vehicle traffic, pedestrians have difficulty crossing the street.


*# 82 - Kulanihakoi speed humps*

## Potential Solution

Install two speed bumps on Kulanihakoi Street to reduce vehicular speed traveling through.

## Jurisdiction

County of Maui

## Cost Estimate

$11,000

## Additional Right-of-way Anticipated

None anticipated

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Cost*** |
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Online Open House

# Project #83
# Kihei Community Center Right Turn

## Background and Needs

The exit on Kihei Community Center can easily back up when a vehicle is trying to make a left turn onto East Lipoa Street, which can cause problems with vehicles navigating the parking.

## Potential Solution

Create a right-turn-only lane when exiting Kihei Community Center. Vehicles turning right will use that lane and ease the backup that can be caused by vehicles attempting to make a left turn.

## Jurisdiction

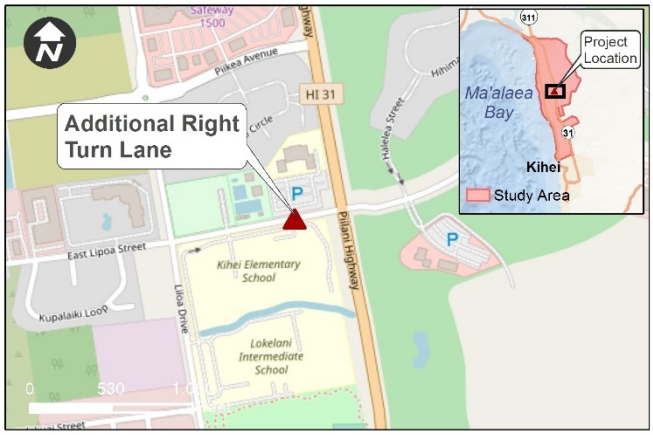
County of Maui

## Cost Estimate

$97,000

## Additional Right-of-way Anticipated

None anticipated




*# 83 - Kihei Community Center right turn*


**Cars exiting Kihei Community Center are backed up because of the difficult left turn**

## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Cost*** |
| ROW | ***Right-of-way*** |
| | ***Local Capacity*** |

## Source

Online Open House

# Project #84
# South Kihei Road Crosswalk Repavement

## Background and Needs

The South Kihei Road and Foodland crosswalk on the *makai* side near the Kalama Park playground needs a smoother surface transition. Currently, it has a surface bump that causes pedestrians to trip and makes it difficult for wheelchair users to traverse it.

## Potential Solution

Repave the surface bump on the crosswalk near South Kihei Road and Keala Place intersection to a smooth surface to ease pedestrian crossing.

## Jurisdiction

County of Maui

## Cost Estimate

$9,000

## Additional Right-of-way Anticipated

None anticipated


#84 - S. Kihei crosswalk repavement


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Cost*** |
| | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |
| | ***Complete Streets*** |

## Source

Online Open House

# Project #85
# South Kihei Road and Kanani Road Intersection Improvements

## Background and Needs

The T-intersection at South Kihei Road and Auhana Road is currently stop-controlled, with one stop sign on Auhana Road. Intersections that are stop-controlled on one approach can sometimes experience long delays. While one direction of traffic is free-flowing, vehicles on the stop-controlled approach must wait to find an acceptable gap in traffic before moving into the intersection.

## Potential Solution

Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.

## Jurisdiction

County of Maui

## Cost Estimate

$1,800,000 - $4,500,000

## Additional Right-of-way Anticipated

None anticipated


#85 - S. Kihei and CovePark crosswalk revamp


## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| ROW | ***Right-of-way*** |
| | ***Land Use*** |
| | ***Safety*** |

## Source

Online Open House

# Project #86
# Keawakapu at Kilohana Pedestrian Light

## Background and Needs

The intersection of South Kihei Road and Kilohana Drive near Keawakapu Beach Park is unsignalized. The pedestrian crossing is well-used by beachgoers and others traveling between the parking lot on the *mauka* side of South Kihei Road and the beach park. Implementing a traffic control system would increase safety in the crossing facility.

## Potential Solution

Signalization and roundabout are both potential solutions. Selection of a specific design should be based on additional engineering analysis and community engagement.

Another potential solution is to move the pedestrian crossing away from the intersection, thereby establishing a midblock crossing, then install a new RRFB for pedestrians traveling to and from Keawakapu Beach Park.

## Jurisdiction

County of Maui

## Cost Estimate

$31,000

## Additional Right-of-way Anticipated

None anticipated


**# 86 - Keawakapu at Kilohana pedestrian light**


***Pedestrian-activated warning light at crossing location***

## Alignment with Kihei Sub-area Transportation Plan Goals

| | | | |
|---|---|---|---|
| | ***Cost*** | | ***Safety*** |
| | ***Right-of-way*** | | |

## Source

Online Open House

# Project #87
# Lipoa Street and Piilani Highway Traffic Signal Modification

## Background and Needs

A longer green light on Lipoa Street is needed for cars wanting to turn left onto Piilani Highway. The short left-turn signal causes cars in Lipoa Street to back up, with a long queue.

## Potential Solution

Optimize signals at the Piilani Highway and Lipoa Street intersection to allow a longer green left-turn signal for vehicles turning left onto Piilani Highway from Lipoa Street.

## Jurisdiction

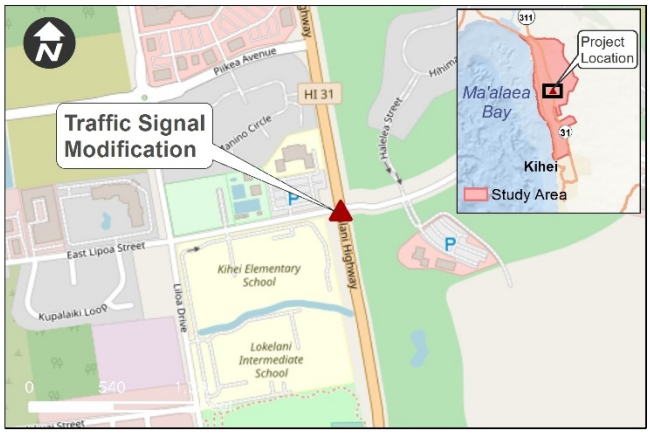
State of Hawaii

## Cost Estimate

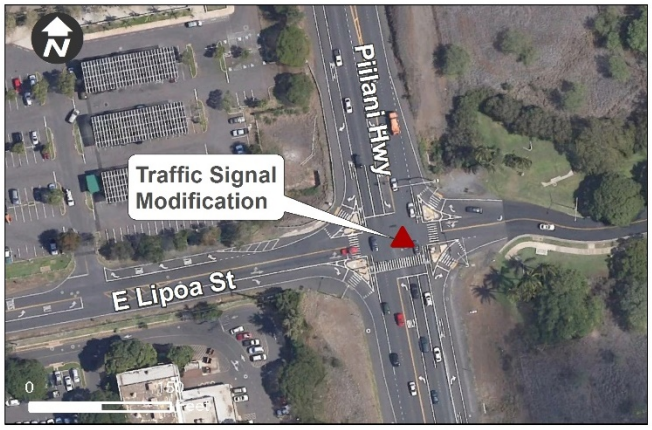
$383,000

## Additional Right-of-way Anticipated

None anticipated




*# 87 - Lipoa St and Piilany Hwy Traffic Signal Modification*




## Alignment with Kihei Sub-area Transportation Plan Goals

| | |
|---|---|
| | ***Regional Capacity*** |
| | ***Local Capacity*** |
| ROW | ***Right-of-way*** |
| | ***Cost*** |

## Source

Online Open House