

Kaua'i Multimodal Land Transportation Plan



PLANNING FOR A SUSTAINABLE TRANSPORTATION SYSTEM
IN KAUA'I COUNTY THROUGH 2035

Adopted by Kaua'i County Council
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This plan was prepared by:



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Kaua'i

Multimodal Land Transportation Plan

EXECUTIVE SUMMARY



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OVERVIEW

The Multimodal Land Transportation Plan (MLTP) outlines steps the County of Kaua'i will take to achieve a balanced multimodal transportation system through the planning horizon year of 2035. This is the County's first Multimodal Land Transportation Plan (MLTP) and will serve as the plan for county roads and streets, public transit, bicycle facilities, pedestrian facilities, agricultural needs, and as a means to integrate land use planning with transportation system development. The preparation of this plan was guided by the most recent County General Plan and was designed to serve as the transportation section of the next General Plan Update. It will be used to guide policies, ordinances, the allocation of transportation funding, the prioritization of transportation projects, and future transportation plans throughout the County.

TRANSPORTATION CHALLENGES

There are a number of challenges the County will face in maintaining and improving its land transportation system to serve residents, visitors and agricultural needs through 2035. The most pressing will be **accommodating a growing population while preserving the rural character and high quality of life that is so important to the people of Kaua'i**. Other transportation challenges identified by residents and community leaders include:

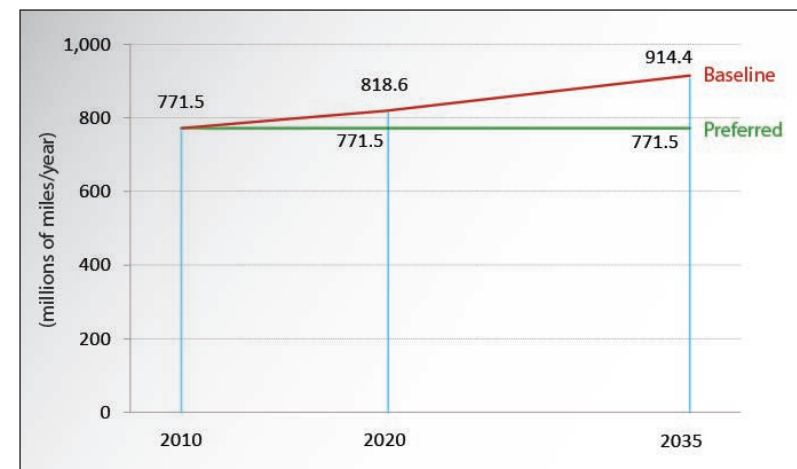
- The existing and forecast increasing cost of a transportation system mostly reliant on imported petroleum fuel;
- Meeting the increasing demand for public transit;
- The high percentage (85-90%) of foods imported from out of state combined with limited access for households to affordable, local, healthy foods;
- The limited choice to travel within and between towns by modes other than driving;
- The lack of safe places to walk and bicycle, particularly for children; and
- Public health issues related to transportation including the limited access to "active transportation" (walking and bicycling)

The goals and objectives of this plan were formulated to address these and other challenges to achieve the vision in the County General Plan.

SCENARIO ANALYSIS

A future scenario analysis was used to guide development of programs and action items described in this plan. Using multiple performance indicators, two potential future scenarios were described. The Baseline Scenario shows where Kaua'i would be in 2035 given current trends, while the Preferred Scenario identifies the interventions that would be required to implement the County General Plan. The Baseline Scenario assumes no intervention in travel behavior which would result in a 19% increase in traffic levels island-wide as well as a 15% increase in the average cost of transportation per household by 2035. Under the Preferred Scenario traffic levels would remain the same through 2035 (see chart below) and household transportation costs would be reduced by 6% by 2035.

Comparison of island-wide annual Vehicle Miles Traveled (VMT) through 2035 under the Baseline and Preferred Scenarios.



The basic idea behind the **Preferred Scenario** is to prevent growth in island-wide vehicle miles of travel above the 2010 level despite an anticipated increase in the resident and visitor populations.

EXECUTIVE SUMMARY

Implementation of the Preferred Scenario would result in far reaching outcomes that support many of the goals of this plan (see table below). These include reduced energy consumption, no increase in traffic levels (reducing the need to widen roads), reduced household transportation costs, increased levels of physical activity, and an increase in the use of the non-driving modes of transportation. **The 2020 and 2035 Preferred Scenario indicators will serve as policy targets for the County to implement this plan.**

Indicator	2010 Level	Difference between 2010 and 2035	
		Baseline	Preferred
Annual VMT (Vehicle Miles Traveled)	771.5 million	↑19%	0%
Annual VMT per Capita	9,496	↓3%	↓18%
Annual Gallons of Motor Fuel Consumed	29.7 million	↓13%	↓27%
Annual Gallons of Motor Fuel Consumption per Capita	365	↓29%	↓40%
Annual GHG Emissions from Ground Transport (kg)	274 million	↓13%	↓27%
SOV* Mode Share	54.4%	0%	↓28%
MOA* Mode Share	38.7%	0%	↓2%
Transit Mode Share	0.4%	↑32%	↑839%
Walk Mode Share	4.5%	0%	↑156%
Bike Mode Share	2.0%	0%	↑274%
Fatalities from Motor Vehicle Collisions per 100 Million VMT	1.30	0%	↓15%
Weekday Transit Ridership	1,641	↑71%	↑1,002%
% of Adults Meeting the Minimum Levels of Physical Activity**	57%	0%	↑32%
Average Annual Household Transportation Costs	\$ 14,860	↑15%	↓6%

*SOV - Single Occupant Vehicle, MOA - Multiple Occupant Auto

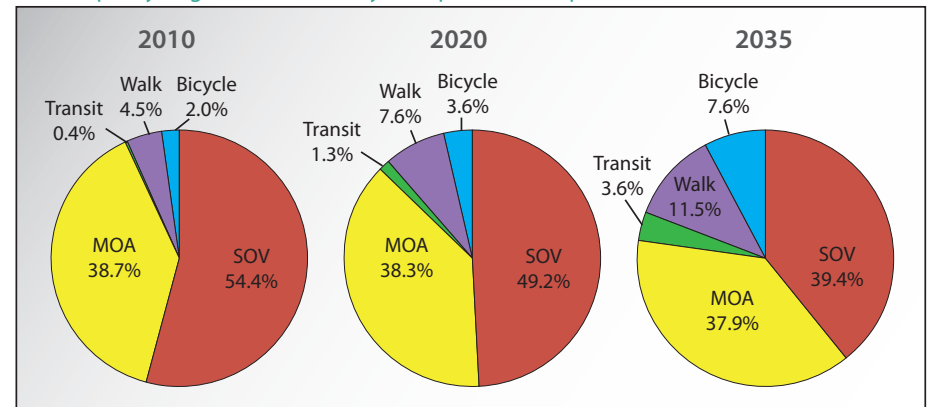
** The CDC recommends adults get 30 minutes of moderate exercise 5 days a week to maintain a healthy lifestyle

In 2010 the average household VMT in Kaua'i was 25,000 compared to 20,000 nationwide. Kaua'i Households also spent an estimated average of \$2,400 more on transportation than the nationwide average

In 2010 0.4% of all trips in Kaua'i were made by transit and 4.5% of all trips were made by walking. In comparison, across the U.S., transit trips accounted for 1.9% of all trips and walk trips accounted for 10.4% of all trips

Accomplishing the Preferred Scenario will require a gradual shift in some of the drive-alone trips that dominate island travel today to other modes of transportation such as walking, biking, and transit (see charts below). The programs, elements, and implementation actions described in this plan include strategies that the County, the State and other agencies will deploy between now and 2035 to make this happen.

The Preferred Scenario mode share of all person trips for 2020 and 2035 (shown here) will serve as policy targets for the County to implement this plan.



* SOV = Single-Occupant Vehicle, MOA = Multiple-Occupant Auto

EXECUTIVE SUMMARY

PROGRAMS

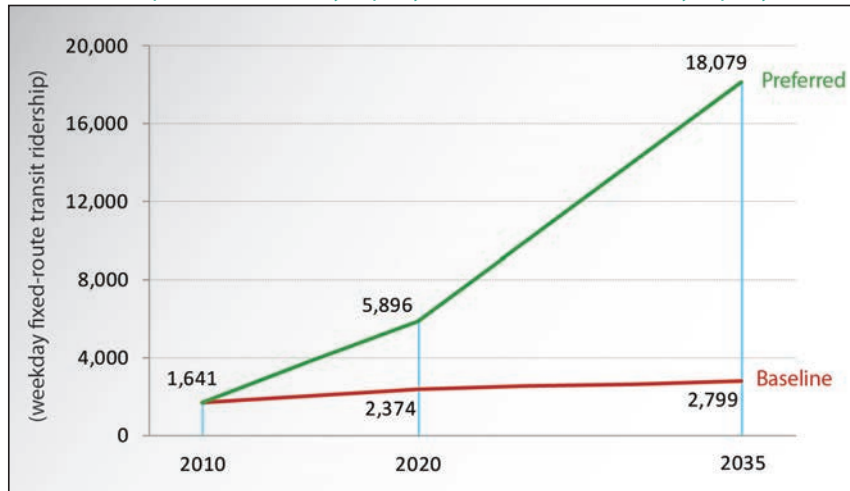
This plan includes six programs as part of implementing an island-wide multimodal transportation network: a transit program, a bicycle program, a pedestrian program, a county roads program, an agriculture transportation program, and a land use program.

TRANSIT PROGRAM

The transit program includes a mix of strategies intended to continue the recent growth in transit ridership. These strategies include increasing operating revenue, increasing external funding, increasing county transit appropriations, and using savings and increased funding to ramp up transit services. The 2035 transit mode share policy target is to achieve a transit mode share of nearly 4% of daily trips, which is equivalent to 18,000 weekday riders (up from 1,600 in 2010).



The transit program includes strategies to meet the County's policy target of growing transit ridership to 6,000 weekday trips by 2020, and 18,000 weekday trips by 2035



BICYCLE PROGRAM

The bicycle program is intended to achieve the County's policy target of an 8% bicycle mode share of all resident and visitor trips by 2035 (up from 2% today). This program recognizes four concepts about bicycle facility development:

1. Regular investment in bicycle infrastructure will benefit both residents and visitors
2. A bicycle system requires a well-connected bicycle network
3. The bicycle program is tightly integrated with the county roads program (particularly in managing safe vehicular traffic speeds)
4. Development of a bicycle network will bring economic benefits to Kaua'i.



PEDESTRIAN PROGRAM

The County has set a 2035 policy target for pedestrian mode share at 12% all person trips, up from 5% in 2010. To encourage more pedestrian trips, this plan describes short and long term pedestrian program components. Each of these components addresses planning and infrastructure improvements that would alleviate the primary deterrents to walking expressed by the public, including the lack of safety, connectivity, and attractiveness of the pedestrian infrastructure.



COUNTY ROADS PROGRAM

The county roads program is driven by several key principles: limit road widening, accommodate all modes of transportation, protect scenic road corridors, support freight transport, reduce excessive speeding, improve the safety of streets for all users, and prevent future traffic growth.



AGRICULTURE TRANSPORTATION PROGRAM

The agriculture transportation program is designed to support Kaua'i's effort to achieve food independence and increased sustainable agriculture. The County will focus its transportation efforts toward this by taking the following approach:

- Reducing the cost of transporting and processing locally-grown farm products;
- Protecting against disruption of on-island transportation networks during storms or other emergency events;
- Improving access by residents and visitors to healthy foods; and
- Ensuring agriculture workers have affordable and reliable access to their jobs.



LAND USE PROGRAM

Land use and transportation are inextricably linked. The land use program recognizes this by addressing critically important design criteria and development guidelines, without which, much of the transportation components of this plan would be difficult to implement. The land use program is guided by the three principle requirements for sustainable development: compactness, completeness and connectedness. By following these principles the County will set forth a path to "keeping Kaua'i rural," a core vision of the County General Plan.

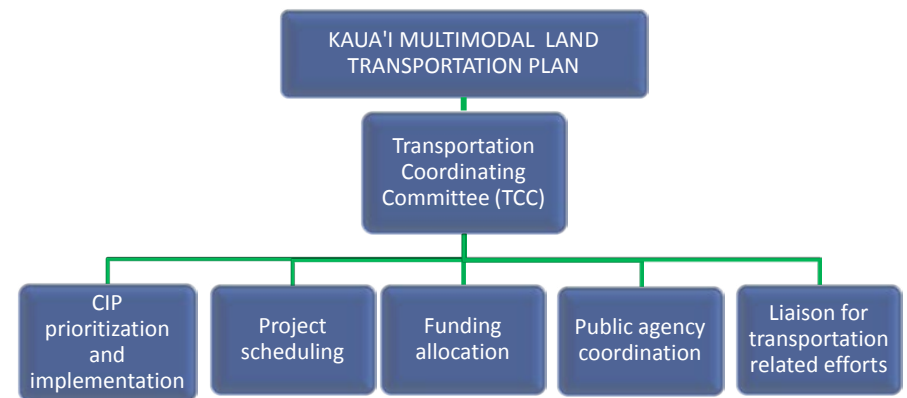


IMPLEMENTATION

This plan takes an action-based approach to meeting Kaua'i's mobility, circulation, and access needs. Given the likelihood of limited funding opportunities and resources available to the County for the foreseeable future, the County will utilize the following strategies to implement this plan:

- 1) Invest resources in the most important things first; and
- 2) Initiate a performance monitoring and reporting system that tracks progress over time.

To achieve the greatest possible integration of funding and investment, a permanent Transportation Coordinating Committee (TCC) will be established to oversee development of this plan (see diagram below). The TCC will consist of representatives from various local and state agencies, and the community. Also included in this plan are a list of the highest priority projects from each of the six programs, a funding strategy to aide in implementation, and a three year action plan.



By enacting this plan the County sets the stage for developing a balanced multimodal transportation system that is integrated with land development patterns and that protects and enhances public health, quality of life, economic vitality and the unique character and heritage of the Garden Isle.

Kaua'i

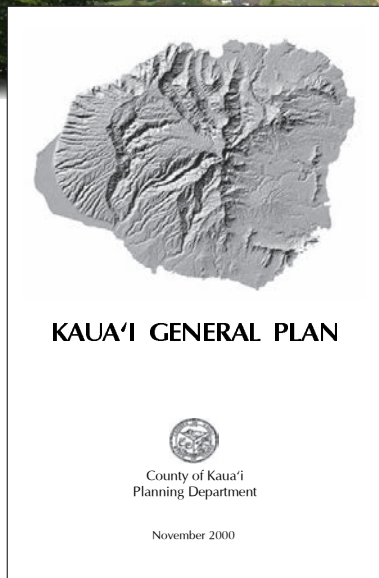
Multimodal Land Transportation Plan

CHAPTER 1 INTRODUCTION



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1. INTRODUCTION



PURPOSE

This plan will serve as the Multimodal Land Transportation Plan (MLTP) for the County of Kaua'i through the planning horizon year of 2035. The preparation of this plan was guided by the 2000 County General Plan. This plan outlines steps the County will take to achieve a balanced multimodal transportation system serving the residents and visitors of Kaua'i and achieving the County's vision for the island's future.

This is the County's first multimodal transportation plan and as such it includes, as a major component, the first transit plan for the island. It also addresses pedestrian, bicycle, and motor vehicle needs, as well as agricultural transportation, and means of integrating land development with transportation planning. The plan focus is not on project lists but on identifying goals and setting forth the actions (projects, programs, policies, ordinances, etc.) to be undertaken to achieve those goals. A number of finer-grained plans will be needed in the coming years. These will include a bicycle system plan, district area plans, town core plans, planning studies, alternatives analyses, corridor plans, and short range strategic transit plans (see the Programs in Chapter 6).

PLAN CONTEXT

This plan was funded by the U.S. Department of Transportation (DOT), with funding administered through the Hawai'i DOT, and was prepared between updates of the Kaua'i General Plan, the last one having been in 2000. This plan was designed to serve as the basis for the transportation section of the next General Plan Update. Once a new General Plan is adopted, the transportation section will be used to guide policies, ordinances, the allocation of transportation funding, the prioritization of transportation projects, and future transportation plans throughout the County.

This Plan was prepared in coordination with the Hawai'i DOT Regional Long Range Land Transportation Plan (RLRLTP) that was under development as this plan was completed. The Kaua'i RLRLTP will serve as the land transportation plan for Kaua'i's state highways and county federal aid roads, while this Multimodal Land Transportation Plan (MLTP) will serve as the plan for county roads and streets, public transit, bicycle facilities, pedestrian facilities, agricultural needs, and programs to integrate land use planning with transportation system development.

1. INTRODUCTION

PLANNING PROCESS

This project was prepared through a combination of comprehensive research, data collection and analysis, direct involvement by members of the public, and multiple meetings between the project team and a variety of stakeholders, all of which was guided by the project's Technical Advisory Committee.

The public helped to identify the issues and opportunities, and later to formulate a vision and goals. Public involvement was attained through a variety of means including two sets of five public workshops (one for each district - see Figure 1-1) during key stages of planning, a travel patterns survey, a bus passenger survey, and an active project website, as well as face-to-face meetings with County Council members, public health groups, business leaders, school officials, the fire department, the police department, farmers and farmers' organizations, neighborhood associations, a resort association, and visitors to a transportation booth at the annual county fair.

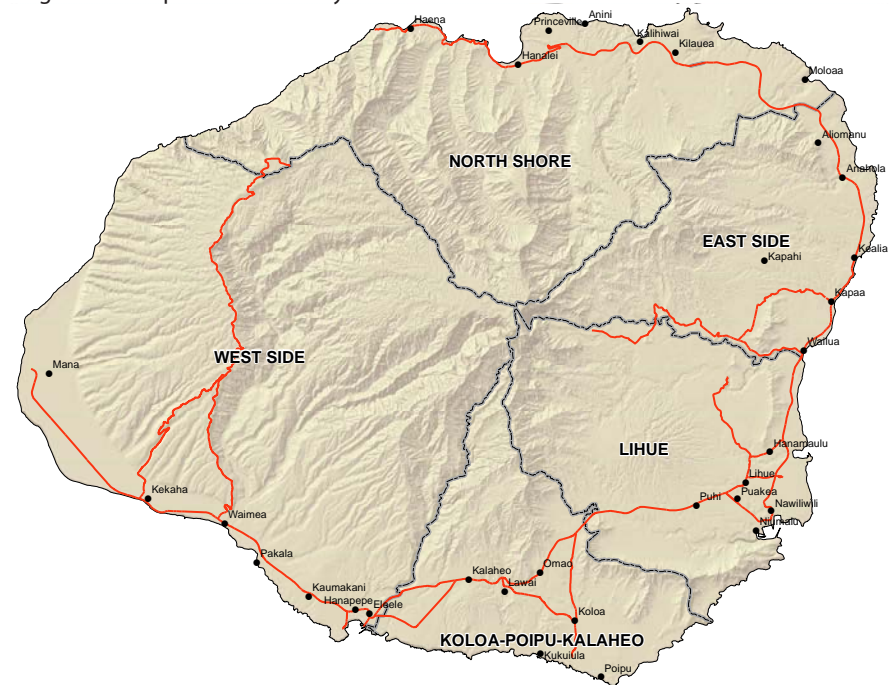
The Technical Advisory Committee (TAC) for the project was comprised of public stewards from the County and State, including the County Transportation Agency (The Kaua'i Bus), the County Planning Department, Public Works, County Housing, and the State DOT. The TAC provided crucial guidance and advice throughout the planning process. This included helping to formulate goals and objectives to achieve the County's vision, developing a planning strategy, prioritizing project needs, and reviewing the draft plan.

A future scenario analysis was used to guide development of programs and action items. Using multiple performance indicators, two potential future scenarios were described (see Chapter 5). The Baseline Scenario shows where Kaua'i would be in 2035 given current trends, while the Preferred Scenario identifies the interventions that would be required to implement the County General Plan. The basic idea behind the Preferred Scenario is to prevent growth in island-wide vehicle miles of travel above the 2010 level despite an anticipated increase in the resident and visitor populations.

Accomplishing the Preferred Scenario will require a gradual shift in some of the drive-alone trips that dominate island travel today to other modes of transportation such as walking, biking, and transit. The programs, elements, and implementation actions described in Chapter 6 and 7 include strategies that the County, the State and other agencies will deploy between now and 2035 to make this happen.

By enacting this plan the County sets the stage for developing a balanced multimodal transportation system that is integrated with land development patterns and that protects and enhances public health, quality of life, economic vitality and the unique character and heritage of the Garden Isle.

Figure 1-1: Map of Kaua'i County Districts



When possible, data and community input was gathered and analyzed at a district level to understand localized needs

Kaua'i

Multimodal Land Transportation Plan

CHAPTER 2 VISION & GOALS



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2. VISION & GOALS

TRANSPORTATION VISION FROM THE KAUA'I GENERAL PLAN:

Chapter 2 of the current (2000) General Plan for Kaua'i describes the vision residents have for Kaua'i in the year 2020. The primary transportation related themes from that vision can be summarized into six main concepts that reflect what residents envision for Kaua'i in 2020:

A Rural Place. Towns are separated by broad open space. The rural roads that link towns are limited to two lanes, lined with vegetation, and absent of medial/concrete barriers, sidewalks, curbs or gutters. Towns are compact; and to minimize traffic congestion and sprawl, new developments are centered around the major towns and job centers of Līhu'e-Hanamā'ulu-Puhi and Kōloa-Poi'pū.

Environmental Preservation/Scenic Beauty. Water and land is protected and responsibly managed. Scenic corridors and public access to beaches are maintained. The County has helped to stimulate the development of more alternative power generation.

Visitors Accommodated. Visitor traffic flow is controlled to minimize noise and crowding. Adequate visitor facilities are provided and visitors are able to tour Kaua'i by motorized vehicle or bicycle.

Strong Local Agriculture/Business. Imports have been reduced and the market for local products expanded. Road infrastructure on state owned land supports diversified agricultural practices.

Prosperity. The cost of living has decreased, the standard of living has increased and people have more time to spend with families and be involved with their communities

Multimodal Options. Safe bicycle and pedestrian routes have been provided. State and county agencies have adopted "flexible highway design," in order to enhance scenic and historic qualities and to strike a balance flow of automobile traffic and safe facilities for buses, bicycles and pedestrians. Increased public parking and pedestrian friendly improvements to sidewalks and streets have been implemented in Līhu'e and Kaua'i's other historic small towns.



2. VISION & GOALS

Kaua'i Multimodal Land Transportation Plan

GOALS AND OBJECTIVES FOR 2020 AND 2035:

Goal 1. Kaua'i County will be served by a balanced, multimodal transportation system that provides choice, flexibility and resiliency in personal access and circulation for all.

Objectives:

- a. Increase the range of practical mode choices available for access and circulation*
- b. Increase transit service levels*
- c. Reduce single-occupant vehicle mode share*
- d. Reduce VMT (vehicle miles of travel) per capita*
- e. Shorten trip lengths (all modes)*
- f. Improve connectivity between local land uses (all modes)*
- g. Ensure equitable access and mobility for all ages and income levels*

Goal 2. Kaua'i County will be served by a freight transport system that supports the island's economic sectors, including food and agriculture, health and wellness, sports and recreation, arts and culture, science and technology, and sustainable technologies and practices.

Objectives:

- a. Encourage job growth*
- b. Support local, sustainable agriculture production, processing or distribution*
- c. Improve access to community gardens and farmers' markets*
- d. Advance sustainable technologies and practices in freight transport*
- e. Protect highway freight transport from the impacts of short term storm and seismic events and long term sea level rise*

Goal 3. Kaua'i County will be served by a transportation system that supports economic vitality and provides affordable access to jobs and economic opportunity.

Objectives:

- a. Reduce the cost of commuting to work*
- b. Reduces the % of household expenditures for housing and transportation (H + T)*
- c. Create jobs associated with sustainable transportation technologies*
- d. Protect personal access and mobility from the impacts of short term storm and seismic events and long term sea level rise*



"a balanced, multimodal transportation system"

"a freight transport system that supports the island's economic sectors"



"a transportation system that provides affordable access to jobs"

2. VISION & GOALS

Goal 4. The Kauaʻi County transportation system will support and enhance public health.

Objectives:

- a. Improve the safety of walking in neighborhoods, villages and towns*
- b. Improve the safety of bicycling in neighborhoods, villages and towns*
- c. Provide access to local recreational facilities, parks and trails for island residents*
- d. Provide safe, convenient pedestrian connections between homes and schools*
- e. Provide safe, convenient bicycle connections between homes and schools*

Goal 5. The Kauaʻi County transportation system will be planned and designed to protect and enhance the island's natural landscapes and environmental quality.

Objectives:

- a. Reduce the physical footprint of roads, streets and drive aisles*
- b. Reduce the physical footprint of surface parking*
- c. Reduce per capita air pollutant emissions from motor vehicles*
- d. Reduce per capita carbon emissions from motor vehicles*

Goal 6. Kauaʻi County will be served by a transportation system that makes efficient use of energy and is less dependent on imported petroleum.

Objectives:

- a. Reduce per capita consumption of petroleum-based fuels in motor vehicles*
- b. Reduce per capita consumption of energy for access and circulation*
- c. Encourage development of alternative energy sources for motor vehicles*
- d. Reduce the cost of alternative energy sources for motor vehicles*
- e. Encourage and facilitate non-auto travel choices for visitors and tourists*

*“ a transportation system
that is less dependent on
imported petroleum ”*



*“ a transportation system
that will support and en-
hance public health . . . ”*

*“ . . . protect and enhance
the island's natural
landscape . . . and rural
character ”*



Goal 7. The Kauaʻi County transportation system will be maintained in a state of good repair.

Objectives:

- a. Provide maintenance, repair and recapitalization of transit capital facilities*
- b. Provide maintenance, repair and recapitalization of roadway facilities*
- c. Provide maintenance, repair and recapitalization of pedestrian facilities*
- d. Provide maintenance, repair and recapitalization of bicycle capital facilities*

Goal 8. Kauaʻi County will be served by a transportation system that protects and enhances the cultural values of Kauaʻi, the rural character of the island and a high quality of life.

Objectives:

- a. Protect cultural resources and sites*
- b. Reduce the concentration of tourism activity at over-used beaches and other sites*
- c. Enhance the cultural values and traditions of Kauaʻi*
- d. Restore historic and prehistoric access routes to appropriate, low impact use*
- e. Protect and enhances scenic resources*

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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 3 PUBLIC PROCESS



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3. PUBLIC PROCESS

Public input was crucial to this plan's development, and Kaua'i residents and leaders were involved in nearly every step of the planning process. Public involvement was attained through a variety of means, including district level workshops, surveys, a project website, and meetings with stakeholders, committees, public representatives, non-profit groups, business leaders, farmers and neighborhood associations. Through the processes described in this chapter the public helped to define the issues and formulate the vision and goals that form the basis of this plan.

Key Public Involvement Components

Public Workshops

- Visioning Workshops (Aug., 2011)
- Plan Refining Workshops (Feb., 2012)

Surveys

- Kaua'i Resident Travel Survey (Aug., 2011)
- The Kaua'i Bus Onboard Survey (Dec., 2011)

Other Public Involvement

- Project Website (throughout project)
- Stakeholder Meetings (throughout project)

PUBLIC WORKSHOPS:

Information gathered during two rounds of public workshops provided valuable content to this plan. The first round of public workshops were held in August, 2011 and helped identify the transportation issues on Kaua'i and create a vision for the plan. The second round of workshops were held in February, 2012 and provided public feedback on the draft plan. Because different towns and regions of Kaua'i face different issues and have different needs, and in an effort to get input from every community, one workshop was held at each of the island's five districts (West Side, Kōloa-Poi'pū-Kalāheo, Līhu'e, East Side, and North Shore). Summaries of the goals and outcomes of each workshop are included here.

Visioning Workshops (August, 2011)

The five workshops held in August, 2011 were intended to give the transportation planning team, County staff and the public an opportunity to discuss the issues and concerns residents of Kaua'i were experiencing related to the island transportation system.



The workshops all followed the same format, although some modifications were made over the two week period based on experience with the earlier workshops. To provide a factual, non-hypothetical basis for the conversation, attendees at each workshop began by filling out mini travel diaries. The diaries allowed attendees to record a recent day of travel, trip by trip, noting start location, end location, mode of travel, length of trip and so forth. Then, attendees participated in break-out group discussions based on the diaries, with a focus on whether transit, bicycling or walking might have been feasible for some of the trips. The groups were asked to describe what the specific barriers were to non-auto travel. Finally the groups described what they envisioned for 2035: what should be different? How should these travel patterns change?

Over 125 people attended the five workshops, with average attendance of about 27 each evening. This allowed three breakout groups each evening, which resulted in a spirited and interesting, but cordial and productive dialogue.

Visioning Workshops Summary (August, 2011):

Goals of the Workshops:

- How are residents getting around Kauaʻi today?
- What are the primary multimodal transportation challenges related to walking, biking, using transit, driving and freight transport that residents face in Kauaʻi?
- What changes would residents like to see related to the multimodal transportation system? What do residents envision for transportation in Kauaʻi in 2035?
- Are there differences/similarities among the five districts?

Outcomes – Primary Resident Desires:

- **Safety:** Walking and biking around Kauaʻi's towns should be safer, especially for children
- **Bicycling:** More bicycle lanes, better bicycle connections between town pairs/groups, and more off-street multiuse paths
- **Walking:** Safer sidewalks/crosswalks in towns, better connections to schools, reliable and well connected pedestrian networks, and better access to bus stops
- **Transit:** Improved transit marketing, more frequency of bus service, more shuttle routes circulating through town, employer/school pass programs, bus shelters at more stops, better onboard storage capacity (for bicycles, surfboards, luggage, etc.), and digital services on buses and at stops (Wi-Fi & GPS tracking)
- **Roads:** Maintain the rural character of Kauaʻi's road network (two-lane streets), reduce vehicular speeding, and provide more alternate routes/connections

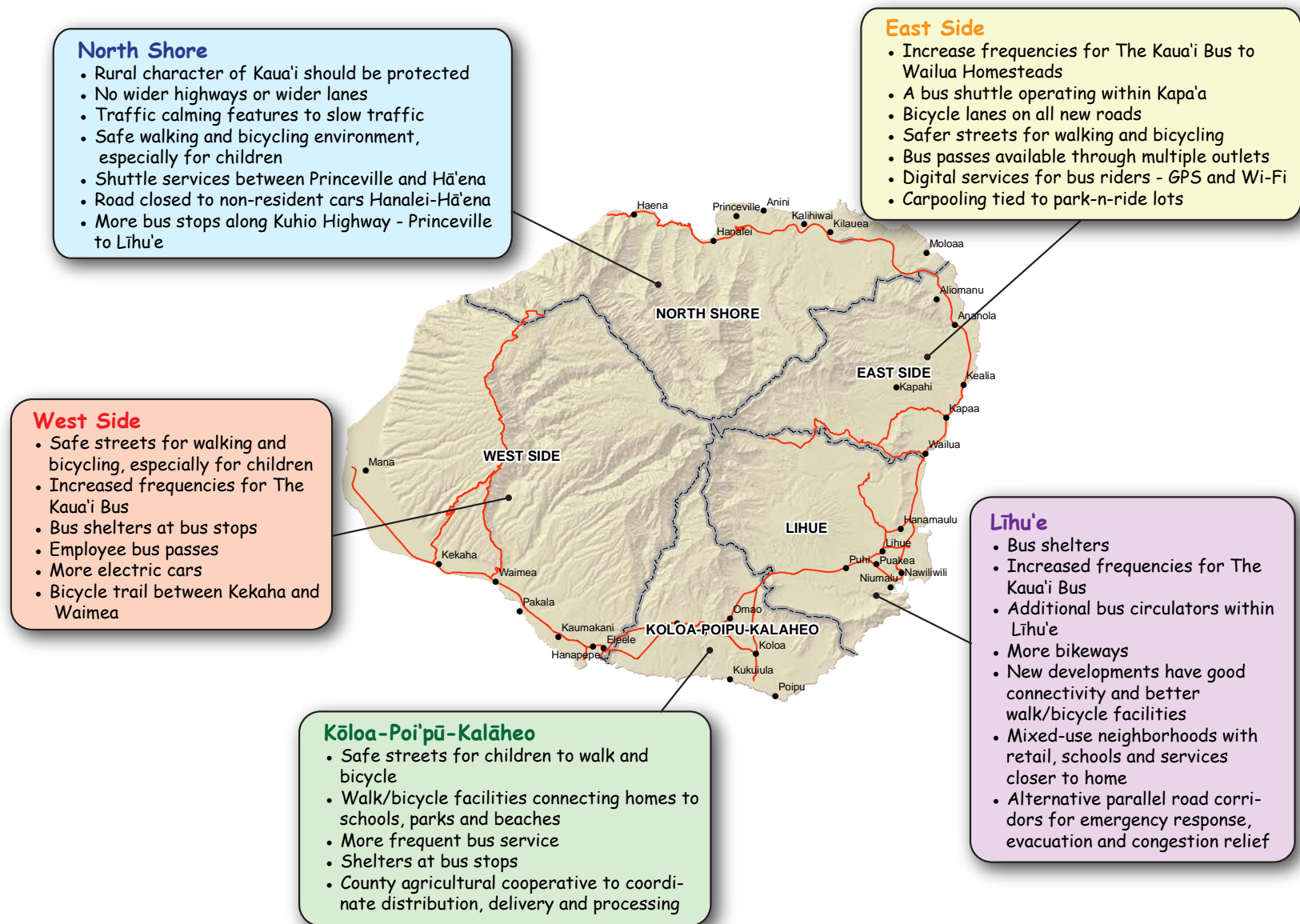


Discussion of transportation challenges at the West Side public workshop in Waimea on August 16, 2011

The key outcomes of the August, 2011 workshops can be summarized into five major categories: safety, transit, bicycling, pedestrians, and local roads and streets. The primary issues and desires expressed by workshops participants are briefly summarized by topic in the “Visioning Workshops Summary” box shown at left. The issues related to transportation and the vision for the future that emerged from these workshops helped to form the core goals for this plan, including the six programs presented in Chapter 6. The workshops revealed that many of the same issues related to transportation are prevalent throughout different parts of Kauaʻi. At the same time, there was also some variation between communities and their vision of the future. A summary of the transportation vision from each district is shown in Figure 3-1. For a more detailed summary of the outcomes of the five workshops including a summary of each workshop see Appendix A.

3. PUBLIC PROCESS

Figure 3-1: Vision of transportation on Kaua'i in 2035 by district (based on the outcomes of the August, 2011 public workshops in Kaua'i)



3. PUBLIC PROCESS

Plan Refining Workshops (February, 2012)

A total of 72 people attended the five plan refining workshops over two weeks in February, 2012. The goal of these workshops were to present the proposed components of the plan (drafted based on the first set of workshops and other stakeholder meetings), and gather feedback from the public. The aspects of the draft plan that were presented for comments included:

- the proposed plan goals and objectives (see chapter 2);
- an analysis of two future scenarios (a baseline and preferred scenario) based on different assumptions about travel behavior (see chapter 5); and
- the six proposed programs to be included in the plan: transit, bicycle, pedestrian, county roads, agriculture, and land use (final programs are presented in chapter 6).

The workshops included several different ways for participants to contribute their opinion. These included:

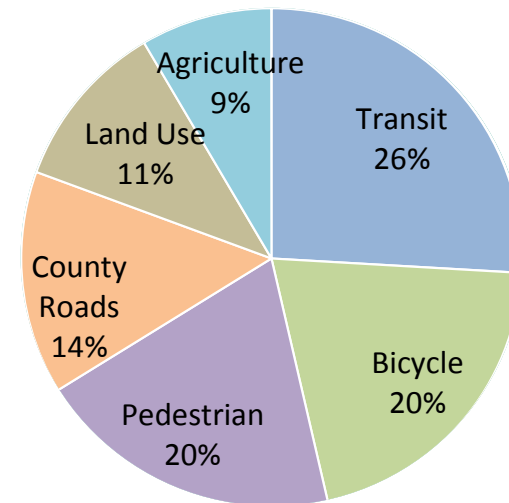
- comment cards;
- a “dots” exercise (one for the transit program, and one for all others) where participants were given a limited number of dots to distribute among the proposed program action items that should have the highest implementation priority;
- a “Kaua’i bucks” exercise where participants were given ten dollars in fake money to distribute among the proposed programs as they saw fit; and
- general discussion where participants were given the opportunity to talk amongst each other and with project staff

The outcomes of the workshop proved to be very positive. Ninety one percent agreed that the plan was on the right track. Seventy six percent agreed with the scenario analysis (see chapter 5), and 88% said the County should work to implement the Preferred Scenario. Of the six proposed programs (presented in chapter 6), transit received the most support, followed by the bicycle and pedestrian programs (see Figure 3-2). A more detailed summary of the workshop outcomes can be found in Appendix B.



East Side public workshop in Kapa’a on February 23, 2012

Figure 3-2: How workshop participants voted among the six proposed programs



Program Support by District (February, 2012 workshops):

- **West Side:** The highest percent of votes went toward the bicycle program, while the land use and agriculture programs received a much lower number of votes than the other districts
- **Kōloa-Poi'pū-Kalāheo:** The highest percent of votes by far went toward the transit program, but the agriculture program received a higher ranking than the other districts
- **Līhu'e:** The highest percent of votes went toward the transit program, but the pedestrian and bicycle programs also ranked high
- **East Side:** The highest percent of votes by far went toward the transit program, and votes were evenly spread between the other five programs
- **North Shore:** The highest percent of votes went toward the county roads program, while the transit program received a much lower ranking than the other districts, and the land use program was ranked higher than other districts



Kōloa-Poi'pū-Kalāheo public workshop in Kōloa on February 14, 2012

SURVEYS

Two surveys were conducted during the planning process to collect resident travel behavior patterns and feedback for the plan. These include:

- The Kaua'i Resident Travel Survey (Aug., 2011)
- The Kaua'i Bus Onboard Survey (Dec., 2011)

Kaua'i Resident Travel Survey

This 20 question survey was conducted over a 3 week period in late August and early September, 2011 and provided travel data such as mode share, trip length, and trip purpose used later in the planning process. Four primary resident transportation attributes were surveyed: 1) general resident information, 2) a travel diary, 3) vehicle characteristics, and 4) household characteristics. Surveys were available both online and in paper format and were distributed at the August public workshops, the Kaua'i Farm Fair, and to local employers. Over 270 surveys were collected. The full report, which contains a complete summary of the results of this survey, is available in Appendix E.

The Kaua'i Bus Onboard Survey

This ten question survey was conducted using face-to-face interviews onboard each of the eight transit bus routes of The Kaua'i Bus, and at a few major bus stops during several weekdays in late November and Early December, 2011. Bus riders that participated in the survey were asked questions related to their transit trip patterns and about the service characteristics most important to them as riders of The Kaua'i Bus. Around 175 surveys were collected, which helped inform the transit section of this plan. The full report, which contains a complete summary of the results of this survey, is available in Appendix F.

These surveys revealed current resident travel patterns in Kaua'i, which are presented in Chapter 4.

3. PUBLIC PROCESS

OTHER PUBLIC INVOLVEMENT

Project Website (ongoing throughout project)

Throughout the planning process, from June, 2011 through the completion of the plan in 2012, the project website, www.moveKaua'i.net, was used to convey information about the plan to the public. The website included a “library page” which displayed notes from previous meetings, survey results, project reports and other project related information. Also included in the website were a “comments page” where members of the public could submit a comment to the project staff and a “Technical Advisory Committee (TAC) page” that was only accessible to TAC members and was used to update TAC members on the progress of the plan. The website was also used to announce events, collect surveys and provided links to other organizations related to the plan. The “What’s New” toolbar was updated regularly to display the latest project documents and current information about the plan.



Screenshot of the project website

Stakeholder Meetings (ongoing throughout project)

Meetings were held with various organizations and stakeholder groups throughout the planning process to gather feedback on transportation related issues and desires. A detailed summary of each meeting is available in Appendix C. Meetings were held with the following organizations:

- Get Fit Kaua'i and Get Fit Kaua'i Built Environment Task Force
- Hanalei Taro
- Haraguchi Taro Farm
- The Kaua'i Bus Transit Advisory Committee
- The Kaua'i Civil Defense Agency
- The Kaua'i Fire Department
- Kaua'i Kunana Dairy
- Kaua'i Meat Company
- Kaua'i Police Department
- The Garden at Common Grounds
- The Kaua'i Visitors Bureau
- North Shore Bicycle Network
- The Kaua'i County Planning Department
- Hawai'i Department of Transportation
- Poi'pū Beach Resort Association
- Kaua'i Farm Bureau

Kaua'i

Multimodal Land Transportation Plan

CHAPTER 4 EXISTING CONDITIONS & TRENDS



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4. EXISTING CONDITIONS & TRENDS

POPULATION & DEMOGRAPHIC TRENDS

Kaua'i County has experienced steady population growth over the past 40 years, and this rate of growth is expected to continue through 2035. Given the high visitor population in Kaua'i, it is useful to show the "de facto" population, which is defined as the average population present on any given day; it includes visitors and excludes residents temporarily absent.

- The de facto population (visitors and residents present) in Kaua'i nearly doubled from about 46,000 in 1980 to about 81,000 in 2010 (see Figure 4-1).
- The de facto population in Kaua'i is expected to grow from about 81,000 in 2010 to nearly 100,000 by 2035 (see Figure 4-1).¹
- With an average visitor population of almost 20,000 in 2010, around 25% of the de facto population, or about one out of every four people in Kaua'i were visitors.
- Using the de facto population, the East Side is the most populated of the five districts in Kaua'i with an average daily population of about 23,000, while the West Side is the least populated, with about 11,000 (see Table 4-1).
- The distribution of jobs is much less balanced than the distribution of population - over half of all jobs in Kaua'i are located in the Lihue district (see Figure 4-2).
- The population of older adults is increasing in Kaua'i (see Figure 4-3). The population of adults 60+ years in age is expected to grow from 22% of the population in 2010 to 31% of the population by 2035.

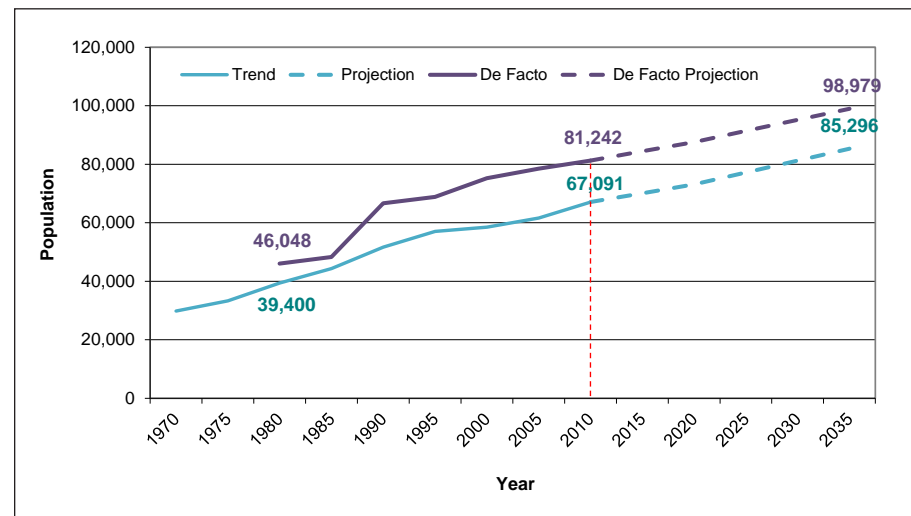
Table 4-1: 2010 population and visitors by district in Kaua'i County

District	House-holds	Popu-lation	Visitor Dwelling Units	Visitors	"De Facto" Population
West Side	3,813	11,722	116	245	11,022
Kōloa-Poi'pū-Kalāheo	4,291	11,696	3,411	7,197	17,950
Lihue	4,728	14,683	1,621	3,420	16,920
East Side	7,374	20,813	2,029	4,281	23,416
North Shore	3,007	8,007	2,167	4,572	11,934
Total	23,213	66,921	9,344	19,716	81,242

Source: U.S. Census Bureau, Hawai'i Visitor Plant Survey, Hawai'i DBEDT

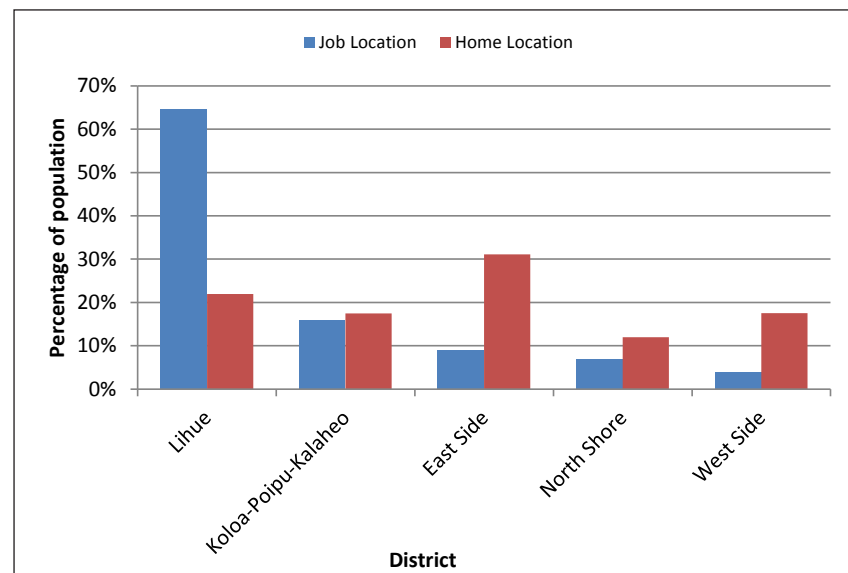
¹ See note at the end of this chapter (page 4-13) about changes in population data from 2010-2011

Figure 4-1: Kaua'i County population trends and projections



Source: Hawai'i DBEDT (trend), Hawai'i DOT - calibrated (projection)

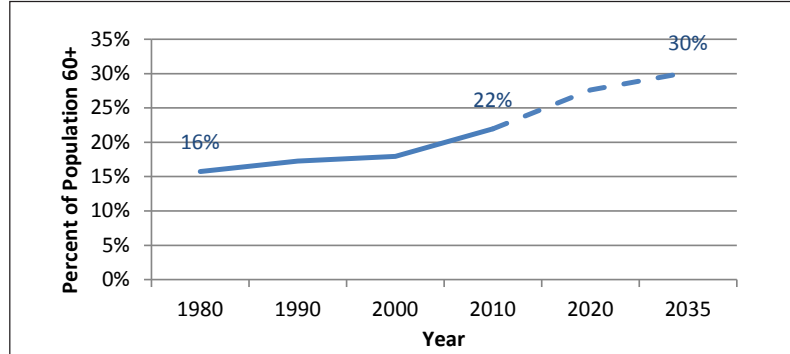
Figure 4-2: Job and home location of Kaua'i residents in 2011



Source: Kaua'i Resident Travel Survey, 2011 (job location); U.S. Census Bureau, 2010 (home location)

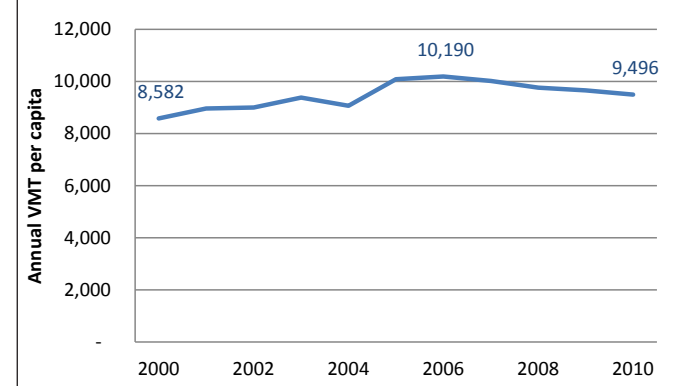
4. EXISTING CONDITIONS & TRENDS

Figure 4-3: Percent of population aged 60+ years in Kaua'i County



Source: Hawai'i DBEDT

Figure 4-5: Annual VMT per "de facto" population in Kaua'i County



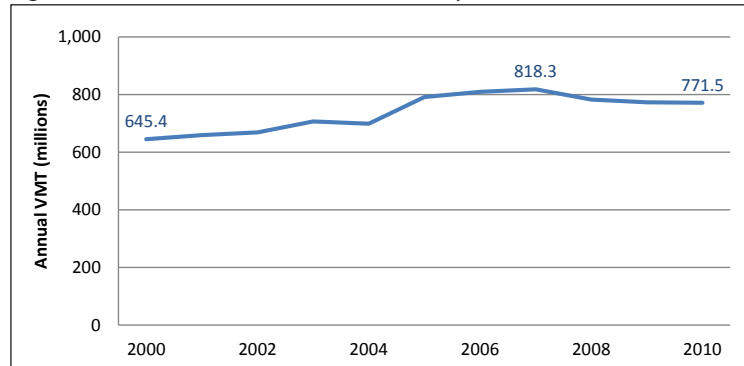
Source: Hawai'i DBEDT

MOTOR VEHICLE TRAVEL

Vehicle Miles Traveled (VMT) is defined as the total miles all vehicles have traveled over a certain area in a given period of time, and is a good indicator of traffic volumes. Annual VMT in Kaua'i grew steadily from 2000 to 2007, but through 2010 had leveled off and even declined slightly. The amount of driving per person (VMT per capita) followed a similar trend over the last 10 years, peaking in 2006 and declining slightly every year since (see Figure 4-5).²

- Traffic volumes (VMT) in Kaua'i increased by 25% from 2000-2007, but declined by 5% between 2007 and 2010 (see Figure 4-4).

Figure 4-4: Annual VMT trend in Kaua'i County



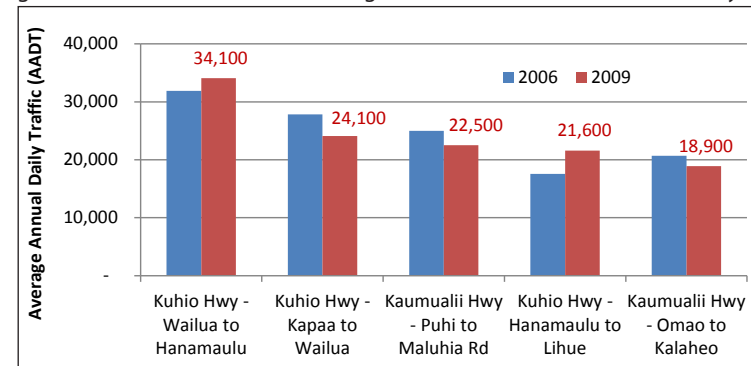
Source: Hawai'i DBEDT

Kaua'i's roadways are comprised almost entirely of two-lane highways, with the exception of a few 3-4 lane stretches in Lihue, a new four-lane section of the Kaumualii Highway in Puhi, and a four mile stretch of the Kuhio Highway between Wailua and Hanamā'ulu that has three lanes including a contra-flow lane. This latter section of road also averages the highest traffic volumes of any in Kaua'i; the AADT along this stretch in 2009 was 34,100 vehicles (see Figure 4-6).



Contra-flow lane along the Kuhio highway, Kaua'i

Figure 4-6: Road sections with five highest traffic volumes in Kaua'i County, 2009



Source: Hawai'i DOT

² See note at the end of this chapter (page 4-13) about increases in VMT and VMT per capita from 2010-2011

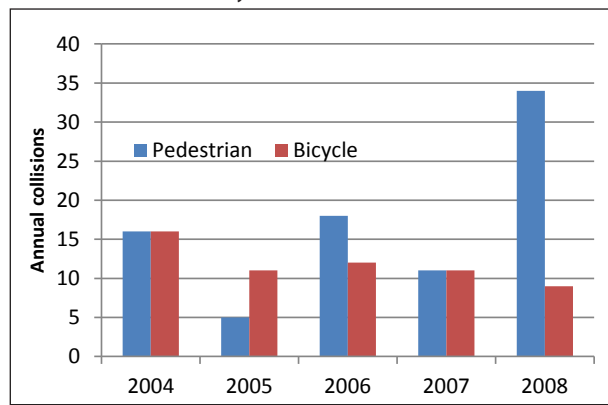
4. EXISTING CONDITIONS & TRENDS

Collision Data

Motor vehicle collision data for Kaua'i was gathered from the Kaua'i County Police department and State of Hawai'i Traffic Safety Section. When analyzed against the de facto population and traffic volumes (VMT), collision rates in Kaua'i have gradually decreased over the last 30 years.

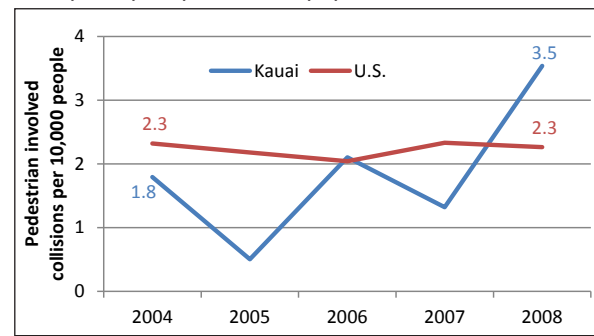
- The number of collisions per person in Kaua'i decreased by nearly half from 1980 to 2010 (see Figure 4-7).
- Between 2000 and 2010 the number of motor vehicle-involved fatalities per 100 million VMT increased from 0.77 to 1.30 per year on Kaua'i while the national averages have been gradually decreasing (see Figure 4-8).
- Between 2004 and 2008 Kaua'i averaged 15 pedestrian-involved collisions and 11 bicycle-involved collisions per year (see Figure 4-9).
- While motor vehicle and bicycle collisions per capita are declining, pedestrian-involved motor vehicle collisions appear to be increasing (see Figure 4-10).
- Between 2004 and 2008 bicycle-involved collisions per capita in Kaua'i gradually decreased while the national average increased slightly (see Figure 4-11).

Figure 4-9: Pedestrian- and bicycle-involved motor vehicle collisions, Kaua'i County



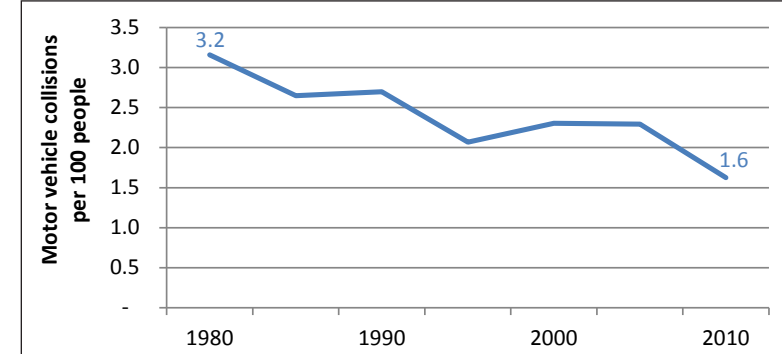
Source: Hawai'i Traffic Safety Section

Figure 4-10: Yearly pedestrian-involved motor vehicle collisions per capita (per de facto population)



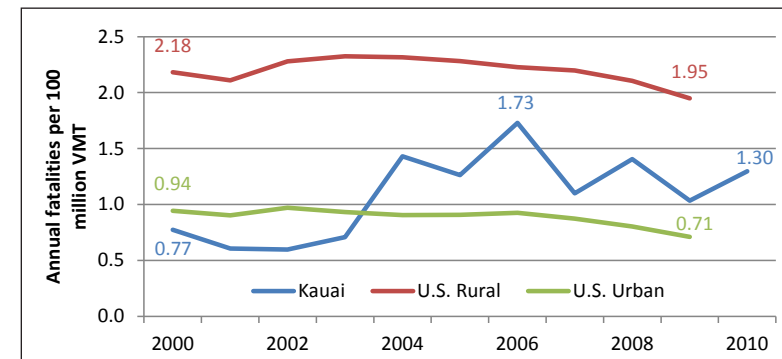
Source: Hawai'i Traffic Safety Section, BTS

Figure 4-7: Yearly motor vehicle collisions per capita (de facto pop.), Kaua'i County



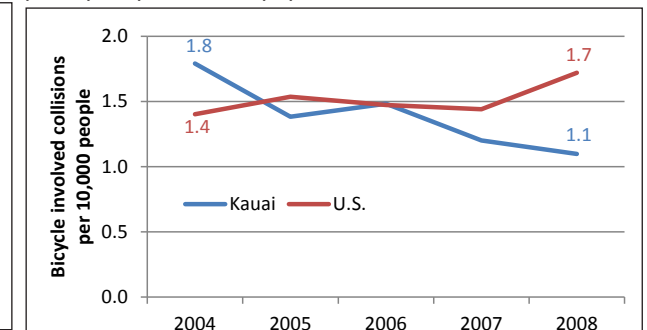
Source: The Kaua'i County Police Dept., Hawai'i DBEDT

Figure 4-8: Yearly fatalities from motor vehicle collisions per 100 million VMT



Source: The Kaua'i County Police Dept., Hawai'i DBEDT, BTS

Figure 4-11: Yearly bicycle-involved motor vehicle collisions per capita (per de facto population)



Source: Hawai'i Traffic Safety Section, BTS

4. EXISTING CONDITIONS & TRENDS

TRANSIT

History

The Kaua'i Bus is the only public transit system in Kaua'i and dates back to the 1970s when a fleet of ten buses was managed by the County of Kaua'i's Office of Elderly Affairs. Fixed-route service was started in 1990 with four routes between Kapa'a and Lihue and was expanded to offer island-wide service in 1992. Service was expanded again in 2004 and periodic expansion of bus routes and schedules has continued since 2004 as funding and vehicles become available.

Routes and Schedules

The County of Kaua'i Transportation Agency now manages The Kaua'i Bus which currently operates eight fixed-route bus lines and a para-transit service. Currently, there are two types of fixed-route bus service: mainline service, which provides regional service between towns, and shuttle service, which operates within or between adjacent towns. Lihue acts as the hub of the transit system (see Figure 4-14 showing a map of bus routes and Table 4-3 for a detailed service description of each route).

Table 4-2: Weekday boardings per revenue service hour (Jul-Dec 2011)

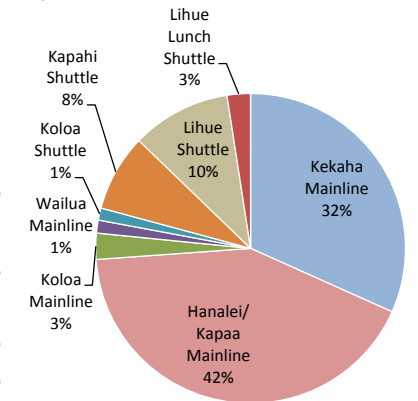
Route	Weekday Service Hours	Weekday Ridership	Boardings per Service Hour
Hanalei-Lihue Mainline	66.5	1,031	15.5
Kapahi Shuttle	15.75	192	12.2
Kekaha-Lihue Mainline	64.5	741	11.5
Lihue Shuttle	30	250	8.3
Wailua-Lihue Mainline	4.5	32	7.1
Lihue Lunch Shuttle	9	59	6.5
Koloa-Lihue Mainline	10.75	67	6.3
Koloa Shuttle	9	32	3.6
Total	210	2,404	11.4

Source: Kaua'i County Transportation agency

Ridership

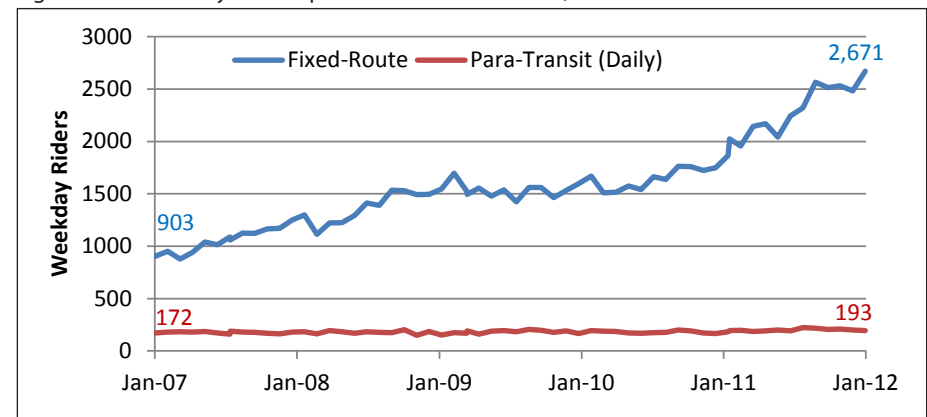
Ridership on The Kaua'i Bus has grown rapidly over the last five years. Average weekday ridership tripled between January, 2007 and January, 2012 (see Figure 4-12). The two core routes of The Kaua'i Bus are the 400/500 pair between Lihue and Hanalei and the 100/200 pair between Lihue and Kekaha. These two routes account for about 75% of total ridership on The Kaua'i Bus (see Figure 4-13). The most cost effective route in 2011 was the Hanalei-Lihue mainline, which averaged 15.5 weekday boardings per revenue hour (see Table 4-2). In comparison, the Kekaha-Lihue mainline averaged 11.5 weekday boardings per revenue hour, while the rest of the routes averaged 8.0 weekday boardings per revenue service hour. The Koloa shuttle was the least cost effective route in 2011, averaging only 3.6 weekday boardings per revenue service hour.

Figure 4-13: Transit ridership by route, 2011



Source: Kaua'i County Transportation Agency

Figure 4-12: Weekday ridership trends of The Kaua'i Bus, 2007-2012



Source: Kaua'i County Transportation Agency

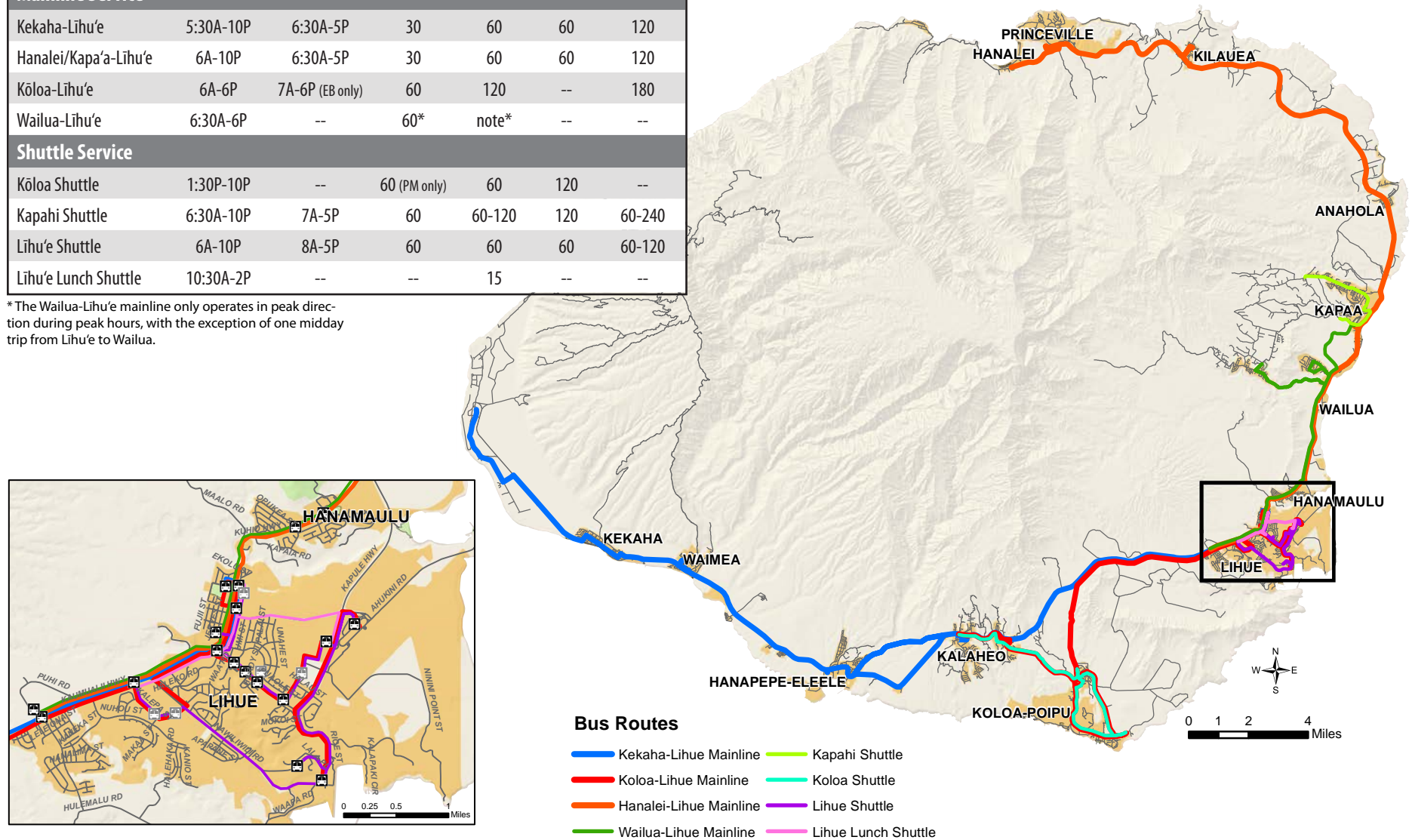
4. EXISTING CONDITIONS & TRENDS

Table 4-3: The Kaua'i Bus Service Description, March, 2012

Route	Hours of Service		Average Service Frequency (minutes)			
	Weekday	Weekend	Peak	Midday	Eve	Wknd
Mainline Service						
Kekaha-Lihue	5:30A-10P	6:30A-5P	30	60	60	120
Hanalei/Kapa'a-Lihue	6A-10P	6:30A-5P	30	60	60	120
Koloa-Lihue	6A-6P	7A-6P (EB only)	60	120	--	180
Wailua-Lihue	6:30A-6P	--	60*	note*	--	--
Shuttle Service						
Koloa Shuttle	1:30P-10P	--	60 (PM only)	60	120	--
Kapahi Shuttle	6:30A-10P	7A-5P	60	60-120	120	60-240
Lihue Shuttle	6A-10P	8A-5P	60	60	60	60-120
Lihue Lunch Shuttle	10:30A-2P	--	--	15	--	--

* The Wailua-Lihue mainline only operates in peak direction during peak hours, with the exception of one midday trip from Lihue to Wailua.

Figure 4-14: The Kaua'i Bus Route Map



4. EXISTING CONDITIONS & TRENDS

Transit Rider Travel Patterns

Travel patterns of transit riders in Kaua'i were obtained from *The Kaua'i Bus Onboard Survey* conducted in late Fall of 2011. Examples of the data collected from that survey include: where transit riders are traveling, how often transfers are needed, the trip purpose, how far people are traveling to get to a bus stop and what mode of transportation they are using to get to the bus. The complete report can be found in Appendix F. The *weekday* travel patterns of transit users from Fall, 2011 are summarized here:

- **Where transit riders were traveling (see Figure 4-15):** The majority of transit trips in Kaua'i began or ended in Lihue (between 50 and 65% of trips from each district besides the Lihue district). Additionally, most people were using The Kaua'i Bus for longer trips. For example, with the exception of trips within the Lihue district, only a small portion of trips began or ended in the same district. Instead most transit users were using the bus to get to/from Lihue or to/from an adjacent district. On the other hand, very few transit users (less than 2%) were using The Kaua'i Bus to get from one side of Kaua'i to the other, crossing Lihue as part of their trip.
- **Trip purpose (see Figure 4-16):** About 40% of transit riders were using the bus to get to school or work. About 10% of transit users were Kaua'i Community College (KCC) students using their student ID.
- **Transfers:** Only 20% of transit users transferred between buses as part of their trip, and about half of those transfers were between the Lihue shuttle and one of the mainline routes.
- **Getting to the bus (see Figure 4-17 & Figure 4-18):** Nearly 75% of transit users walked to the bus, about 20% were dropped off, and only 4% drove and parked at a bus stop. About 60% of transit users traveled a quarter of a mile or less to get to the bus, while about 25% traveled a mile or more. About 73% of those walking to the bus traveled a quarter mile or less, while about 11% of the people walking to the bus walked a mile or more. The average distance to get to a bus stop was 0.6 miles and the average walking distance was 0.4 miles.

Figure 4-15: Trip profile of transit users by district

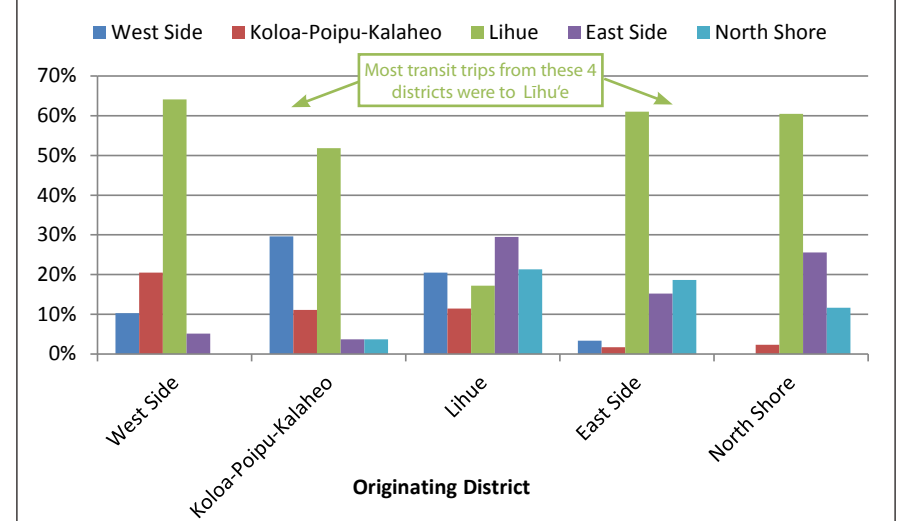


Figure 4-16: Transit user trip purpose

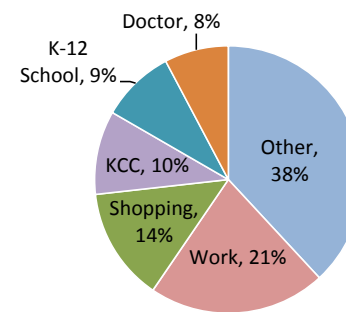


Figure 4-17: Mode share to bus

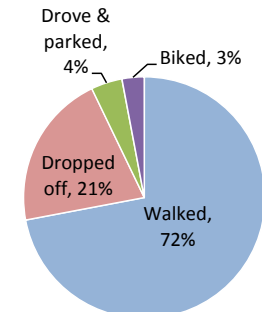
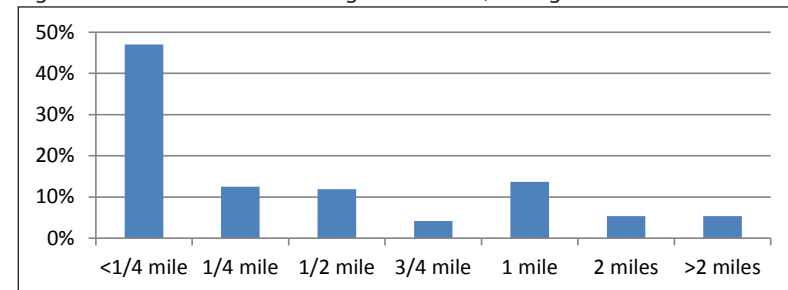


Figure 4-18: Distance traveled to get to the bus; average is 0.6 miles



4. EXISTING CONDITIONS & TRENDS

Bus Fleet

The Kaua'i Bus maintains a fleet of 43 buses that range in size from 16 to 33 seated passengers, plus 11 14-passenger vans (see Table 4-4). During peak hours there are approximately 20 buses operating in fixed-route service (see Figure 4-19). All buses are diesel powered with the exception of one hybrid. The average age of the fleet is 4 years and the average miles logged is 150,000. All buses are wheelchair accessible and equipped with a front bicycle rack that can store up to two bicycles.

Budget and Funding

The total budget for The Kaua'i Bus for FY 2012 was \$7,376,560. Most of the budget, 78%, was used for operations, while 22% was allocated to capital expenses, including buses and bus stop improvements (see Figure 4-20). Most of the expenses for operations were used to pay the salaries and benefits of bus drivers and mechanics, but about 14% of operations expenses were used to purchase fuel, and 8% paid for administrative costs (see Figure 4-21). Sixty four percent of the funding for The Kaua'i Bus was provided by the County General fund. Twenty two percent of funding was provided by the Federal Transit Administration (FTA) (see Figure 4-22). In FY 2012 an estimated \$800,000, or 14% of the operations budget, was funded by operating revenues. This includes fare box receipts, passes and contracts.

Figure 4-19: Weekday fixed-route buses in service, Jan, 2012

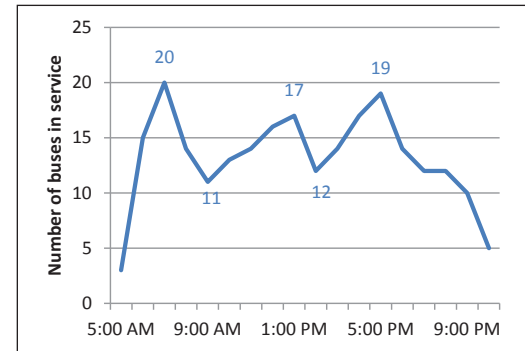
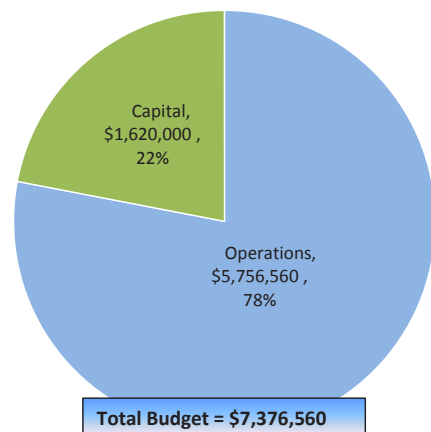


Table 4-4: The Kaua'i Bus Fleet, 2011

Vehicle Size	Number of Vehicles
33 Passenger	9
31 Passenger	6
25 Passenger	4
22 Passenger	5
20 Passenger	8
18 Passenger	11
14 Passenger	11
Total	54

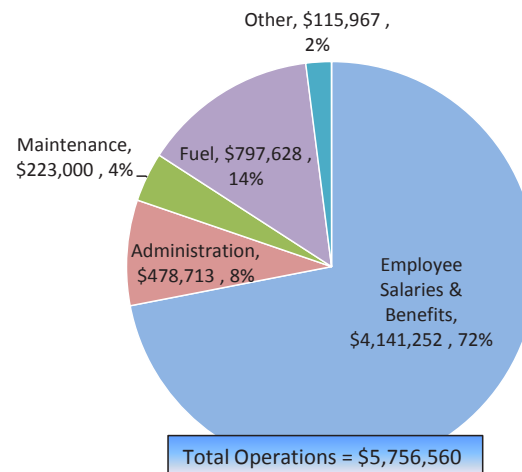
Source: Kaua'i County Transportation agency

Figure 4-20: The Kaua'i Bus FY 2012 budget



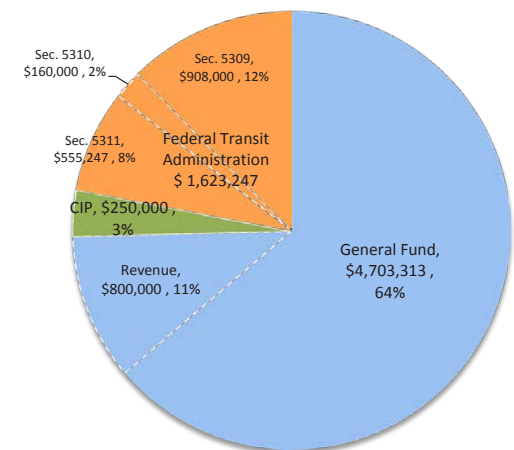
Source: Kaua'i County Transportation Agency

Figure 4-21: The Kaua'i Bus FY 2012 operations budget



Source: Kaua'i County Transportation Agency

Figure 4-22: The Kaua'i Bus FY 2012 funding sources



Source: Kaua'i County Transportation Agency

4. EXISTING CONDITIONS & TRENDS

Peer City Comparison

To get a better idea of the operating efficiency and cost effectiveness of service provided by The Kaua'i Bus it is useful to compare service level indicators with other peer transit agencies. Five transit agencies operating in the western U.S. and serving similar sized communities with relatively high tourism profiles were selected for this comparison (see Table 4-5). These include:

- The Northern Arizona Intergovernmental Public Transit Authority (NAIPTA) that provides transit service to the Flagstaff, AZ metropolitan area;
- The Roaring Fork Transit Authority (RFTA) that provides transit service between Aspen and Glenwood Springs in the Roaring Fork Valley of Colorado;
- The Cache Valley Transit District (CVTD) that provides transit service in and around Logan, UT;
- Bend Area Transit (BAT) that provides transit service to Bend, OR; and
- Santa Fe Trails that provided transit service to the Santa Fe, NM region

When compared to these peer transit agencies, it was found that The Kaua'i Bus operates its fixed-route service at a lower cost per mile and at a lower cost per revenue service hour than any of these other agencies (see Table 4-5). This indicates that The Kaua'i Bus has the highest operating efficiency of all those listed in Table 4-5.

On the other hand, The Kaua'i Bus averaged the second lowest ridership per revenue service hour and the lowest ridership per mile. This is largely indicative of the fact that The Kaua'i Bus operates a rural service, even more so than the other agencies included in this comparison. The average miles per ride on The Kaua'i Bus are much higher than the other agencies – including RFTA which operates a number of 40+ mile routes – meaning more people are using The Kaua'i Bus to travel longer distances.

Given that The Kaua'i Bus is operating at such an efficient cost per revenue bus hour, the agency should focus on maintaining this low operating cost while growing ridership. This would help The Kaua'i Bus reduce its overall operating cost per rider. This could be achieved by making targeted operating improvements, including: eliminating deadheads runs to start and end West Side and North Shore routes by providing vehicle storage and service in these areas; streamlining mainline routes to avoid detours into shopping centers; reducing the reliance on expensive petroleum fuel imports; and using larger buses with higher load capacities for the busy mainline routes. More is discussed on these strategic improvements in the Transit Program (Chapter 6A).

Table 4-5: Peer city comparison of operations cost and service indicators of fixed-route service

Transit Agency	The Kaua'i Bus	NAIPTA	RFTA	CVTD*	BAT	Santa Fe Trails
Year	2011**	2010	2011	2010	2010	2010
Location	Kaua'i, HI	Flagstaff, AZ	Aspen-Glenwood Springs, CO	Logan, UT	Bend, OR	Santa Fe, NM
Service area population	67,000	57,050	45,000	80,000	80,995	76,100
Annual vehicle revenue hours	60,293	46,432	241,229	52,933	20,902	76,988
Annual vehicle miles	966,866	628,658	4,040,020	817,133	266,086	918,193
Annual ridership	699,902	1,115,254	4,082,170	1,898,848	327,904	838,841
Operations Budget	\$3,937,849	\$3,985,946	\$29,126,000	\$3,477,894	\$1,489,094	\$6,053,701
Ridership per service hour	11.6	24.0	16.9	35.9	15.7	10.9
Ridership per mile	0.7	1.8	1.0	2.3	1.2	0.9
Miles per ride	1.4	0.6	1.0	0.4	0.8	1.1
Cost per rider	\$5.63	\$3.57	\$7.13	\$1.83	\$4.54	\$7.22
Cost per vehicle revenue hour	\$65.31	\$85.84	\$120.74	\$65.70	\$71.24	\$78.63
Cost per vehicle revenue mile	\$4.07	\$6.34	\$7.21	\$4.26	\$5.60	\$6.59

*CVTD operates free bus service on all their routes

**The July-Dec average for ridership was used to reflect the service frequency increases that took effect in February and June, 2011.

Source: Kaua'i County Transportation Agency, RFTA, and FTA's National Transit Database.

4. EXISTING CONDITIONS & TRENDS

TRAVEL DEMAND & MODE SHARE

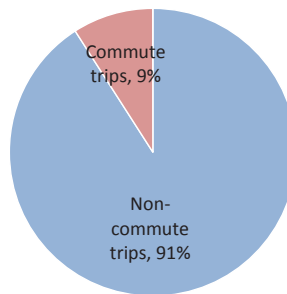
A comprehensive multimodal travel patterns study was conducted in August, 2011. The 272 *Kaua'i Resident Travel Survey's* collected as part of this study were used to estimate travel demand and mode share in Kaua'i that is described here. All data from this study was based on person-trips, defined as a one way trip greater than 200 feet in length. When using person trips, each mode, and the trip between each destination were counted as separate trips. For a complete summary of the results of the study see Appendix E. Results of this survey show that:

- The average person in Kaua'i makes 5.0 trips per day.
- The average trip length is 5.4 miles.
- Approximately 91% of all trips made in Kaua'i are non-work trips.
- Approximately 93% of all trips in Kaua'i are made by driving (54% by driving alone).

Trip Purpose

Based on the results of *The Kaua'i Resident Travel Survey*, about 23% of all weekday trips of residents aged 16 and older are commute trips. However, because visitors make up such a large percentage of the de facto population of Kaua'i, it is estimated that 91% of *all trips* in Kaua'i are non-commute trips (see Figure 4-23). This is based off an employee rate of 35% of the de facto population.³ Therefore, a significant portion of transportation planning efforts toward achieving modal shifts in Kaua'i should target non-commute trips.

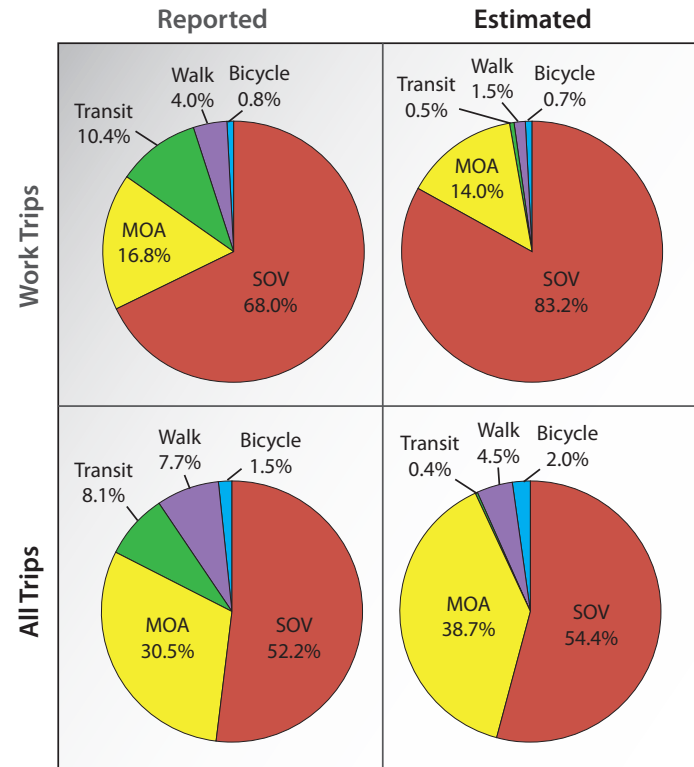
Figure 4-23: Estimated trip purpose of all trips in Kaua'i, 2011



Mode Share

Travel mode share in Figure 4-24 is presented in two forms: reported mode share, which is self-reported data directly from *The Kaua'i Resident Travel Survey*, and estimated mode share. Estimated mode share of work trips is from the 2009 American Community Survey (ACS), while estimated mode share for all trips was calibrated from the results of the travel survey based on the 2009 ACS data for work trips. A more complete methodology is available in Appendix D.

Figure 4-24: Reported and estimated mode share in Kaua'i, 2011



*SOV = Single-Occupant Vehicle, MOA = Multiple-Occupant Auto

Using the estimated mode share, about 93% of all trips in Kaua'i in 2011 were made by driving, most of which were people driving alone. About 4.5% of all trips were made by walking, 2% by biking and only 0.4% by transit. Driving accounted for an even higher percentage of work trips (97%) than non-work trips (93%), and 86% of people driving to work were driving alone. The transit mode share of commute trips was slightly higher than the transit mode share of non-commute trips. However, less than 1% of commuters were using transit to get to work in Kaua'i in 2011. In comparison, the average mode share throughout the United States in 2009 was 83.4% of trips by driving, 10.4% by walking and 1.9% by transit. Transit accounted for 3.7% of commute trips nationally.⁴

³ Assumes 29,000 employed persons on Kaua'i as reported by the Hawai'i Department of Labor and Industrial Relations (DLIR). See Appendix D for more details on how trip purpose was calculated.

⁴ 2009 National Household Travel Survey (NHTS)

4. EXISTING CONDITIONS & TRENDS

Trip Length

The average trip length for all modes in Kaua'i in 2011 was 5.4 miles. However this varied greatly by the mode used and trip purpose (see Table 4-6).

- The average transit trip length was about twice the average drive trip length.
- The average trip length of bus and driving trips were longer for commute trips than non-commute trips, but were the opposite for bicycle and walk trips. This illustrates the fact that residents are willing to walk and bicycle farther when using these modes for other trip purposes, such as recreation and running errands, than when commuting by those modes.
- Over 50% of all trips were 5 miles or less in length.

Table 4-6: Average trip length on Kaua'i by mode, 2011

Mode	Commute Trips (miles)	Non-Commute Trips (miles)	All Trips (miles)
Drive Alone (SOV)	9.0	6.7	8.2
Carpool (MOA)	11.2	7.0	8.2
Transit	16.1	15.3	15.9
Walk	0.5	1.3	1.1
Bicycle	1.1	4.0	3.2
All Mode Average	8.3	5.1	5.4

Source: Kaua'i Resident Travel Survey, 2011

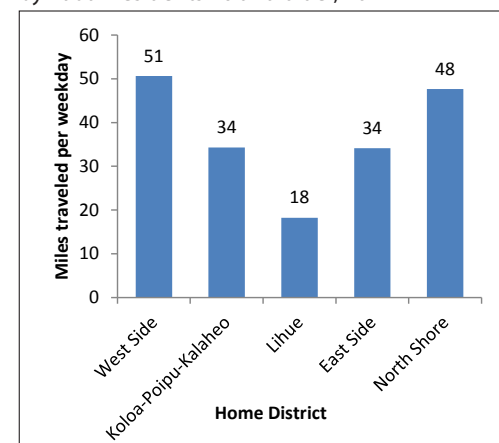
Daily Miles Traveled

In 2011, residents 16+ years of age traveled an average of 33 miles every weekday. However this varied significantly by district (see Figure 4-25).

- Residents who live in the North Shore and West Side were traveling an average of almost three times the distance of Lihue residents every weekday.
- Residents of Kōloa-Poi'pū-Kalāheo and the East Side were traveling almost twice the distance of Lihue residents.

These findings illustrate the fact that the further people live from Lihue, the more miles they tend to travel in a day.

Figure 4-25: Average miles traveled per weekday by Kaua'i residents 16 and older, 2011



Source: Kaua'i Resident Travel Survey, 2011

Household Transportation Costs

Transportation is the second largest household expense after housing, and the cost of transportation has a significant impact on how easily families can access jobs, services, and recreational opportunities. According to the Center for Neighborhood Technologies (CNT), to be considered affordable, the combined expense of housing and transportation (H+T) should not exceed 45% of a household's budget, and transportation costs alone should not exceed 15%. In this plan, it was assumed that H+T costs should not exceed 50% of household income (and transportation costs should not exceed 20%) to be considered affordable.

Table 4-7 describes the estimated average cost of transportation per household in each district in Kaua'i in 2010. Transportation costs were calculated using the same three inputs used by CNT: auto ownership, auto use, and transit use, plus one addition - bicycle use.⁵ In 2010 the average household in Kaua'i spent about \$14,900 on transportation or 24% of median household income. This was \$2,400 more than the U.S. average. This also means about 59% of households in Kaua'i are spending more than 20% of their income on transportation.

Table 4-7 also shows that the majority of transportation costs in Kaua'i are from driving. Driving costs are mainly determined by the number of vehicles owned and miles driven (VMT) per

⁵ See Appendix D for a list of sources and the full methodology used to calculate average transportation costs

4. EXISTING CONDITIONS & TRENDS

Table 4-7: Average 2010 household (HH) transportation costs

District	Driving Cost Factors		Average 2010 Household Transportation Costs					% of HHs Spending >20% of Income on Transport
	Annual HH VMT	Vehicles per HH	Driving Costs	Transit Costs	Bicycling Costs	Total Transp. Costs	% of Median Income	
West Side	38,955	2.0	\$17,431	\$ 34	\$ 40	\$17,505	29%	69%
Kōloa-Poi'pū-Kalāheo	23,026	2.1	\$14,874	\$ 30	\$ 35	\$14,939	25%	58%
Līhu'e	13,889	2.1	\$13,424	\$ 34	\$ 40	\$13,498	22%	54%
East Side	23,844	2.1	\$14,610	\$ 31	\$ 36	\$14,677	23%	54%
North Shore	31,757	1.6	\$14,033	\$ 29	\$ 34	\$14,097	26%	58%
Kaua'i County	25,092	2.0	\$14,791	\$ 31	\$ 37	\$14,860	24%	59%
U.S.	19,850	1.8	\$12,440	?	?	\$12,440*	24%*	57%*

*Value only includes driving cost. If other modes of transport were included this value would be marginally higher.

See Appendix D for methodology and sources.

household. Average household VMT, vehicle ownership rates, and the cost of gasoline in Kaua'i were all higher than the U.S. average in 2010.

Additionally, the average cost of housing in Kaua'i is significantly more expensive than the U.S. average. For example, the median cost of housing in 2010 for Kaua'i households is equivalent to about \$16,700 per year, compared to a median of \$12,600 nationwide.⁶ Based on this, 51% of Kaua'i households were spending more than 50% of their income on H+T costs in 2010, compared to 48% of households nationwide.⁷

The average cost of transportation per household in Kaua'i also varies significantly by district. Households in the West Side pay the most, an average of \$17,500 per year on transportation. This means nearly 70% of households in the West Side would need to spend more than 20% of their income to afford the average cost of transportation in that district. Households in Līhu'e pay the least for transportation, an average of \$13,500 per year. This means 54% of Līhu'e households would need to spend more than 20% of their income on transportation. This variation is mostly due to the large difference in average annual household VMT between districts.

⁶ Calculated from the weighted average of households paying mortgages, households who own but don't pay mortgages, renters paying rent and renters not paying rent. Utilities, insurance, taxes and other fees are included.

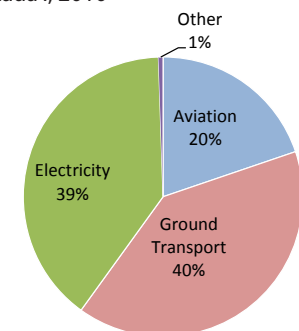
⁷ Household income, median mortgage costs, median rental costs, owner to renter ratio, and mortgage to non-mortgage owners for Kaua'i County and the U.S. come from the 2006-2010 American Community Survey (ACS)

GROUND TRANSPORTATION ENERGY USE & DEMAND

Nearly all of Kaua'i's ground transportation is powered by petroleum fuel (gasoline and diesel). Ground transportation in 2010 consumed about 40% of all 74 million gallons of liquid fuel used in Kaua'i⁸ (see Figure 4-26).

Because Hawai'i does not produce petroleum fuel, Kaua'i must import all of its fuel from out of state. Therefore, the average price of gasoline and diesel in Kaua'i is typically about 70 cents higher than in the rest of the U.S. Additionally, at any given time there is only about a one week supply of petroleum fuel available on Kaua'i. Because of the low storage volumes, higher than average prices, and a heavy reliance on imports, Kaua'i's existing transportation fuel supply is vulnerable to price fluctuations and supply disruptions.

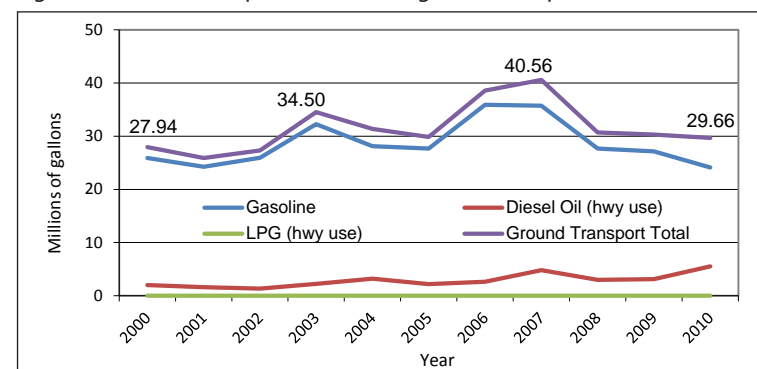
Figure 4-26: Liquid fuel use in Kaua'i, 2010



Source: Hawai'i DBEDT

Liquid fuel consumption from ground transportation on Kaua'i has fluctuated over the last 10 years, peaking in 2007 with over 40 million gallons consumed (see Figure 4-27). Liquid fuel consumption has since dropped to just under 30 million gallons a year. Part of this decrease can be attributed to a slight decrease in VMT, but most of this drop has to do with the fact that the vehicle fleet fuel economy in Kaua'i increased from an average of 20 mpg in 2007 to 26 mpg in 2010.⁴

Figure 4-27: Trend of liquid fuel used for ground transportation in Kaua'i



⁸ Hawai'i Department of Business, Economic Development, and Tourism (DBEDT)

Source: Hawai'i DBEDT

4. EXISTING CONDITIONS & TRENDS

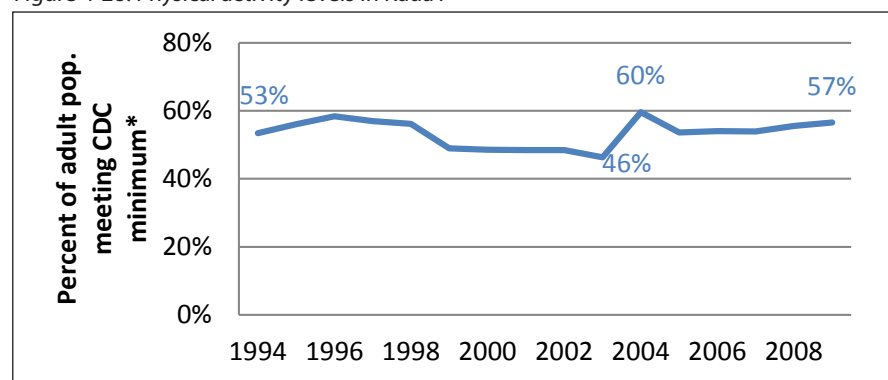
PUBLIC HEALTH

Transportation impacts a number of key aspects of public health including physical activity, air pollution, safety, access to healthy food, and access to outdoor recreational facilities among others. Data covering some of these topics for Kauaʻi are discussed here.

Physical Activity

The Center for Disease Control (CDC) recommends that adults get a minimum of 30 minutes of moderate exercise 5 days a week to maintain a healthy lifestyle. As of 2009, only 57% of the adult population in Kauaʻi was getting the minimum recommended amount of physical activity. Data reveals that levels of physical activity have increased only minimally since 1994, if at all (see Figure 4-28).⁹

Figure 4-28: Physical activity levels in Kauaʻi



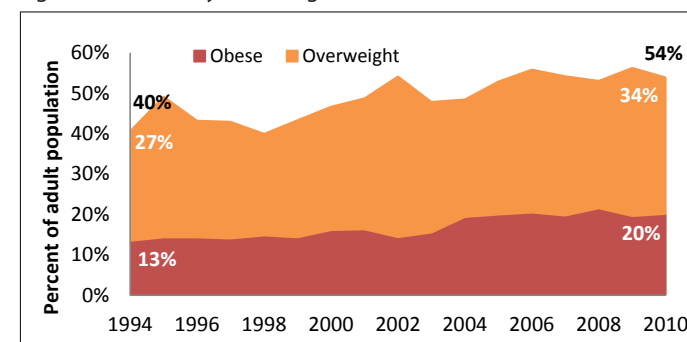
* The CDC recommends that adults get a minimum of 2.5 hrs. of moderate physical activity a week.

Source: Hawaiʻi BRFSS Report

Obesity/Overweight Trends

Similar to trends across the U.S., the rates of adult obesity have increased steadily in Kauaʻi since 1994 (see Figure 4-29). The percent of the adult population that is obese (as defined by the Behavioral Risk Factor Surveillance System) increased from 13% to 20% and the portion of the adult population either overweight or obese has increased from 40% to 54% of the population.

Figure 4-29: Obesity/overweight trends in Kauaʻi



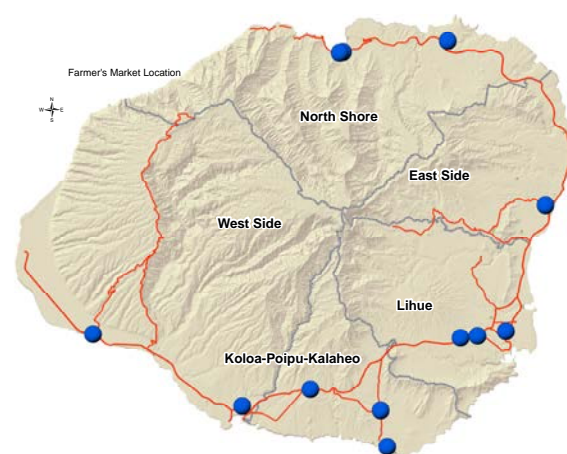
Source: Hawaiʻi BRFSS Report

Healthy Food Access

Kauaʻi's rich volcanic soil, plentiful rainfall, year-round growing season and abundant agricultural land (about 15% of the land area in Kauaʻi, or 55,000 acres, are considered prime agricultural land¹⁰) make Kauaʻi an ideal location for a food system based on locally grown food. However, as recently as 2010 about 85%-90% of food consumed in Kauaʻi was imported from outside the State.¹¹

The primary means for farmers to distribute locally grown food in Kauaʻi is through farmers' markets. In 2011 there were 13 weekly farmers' markets in Kauaʻi, at least one in each district (see Figure 4-30). The East Side is the only district that hosts only one farmer's market (located in Kapa'a); this despite the fact that the East Side has the highest population of any district in Kauaʻi.

Figure 4-30: Farmer's market locations in Kauaʻi



10 Agricultural Lands of Importance to the State of Hawaiʻi (ALISH) study.

11 Hawaiʻi Department of Agriculture 2009 White Paper on Food Self-Sufficiency

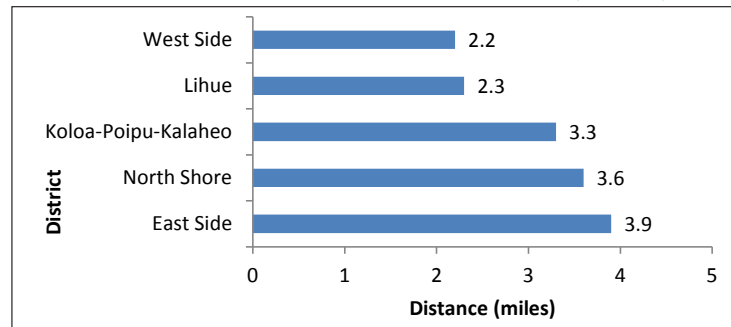
9 1994-2009 Hawaiʻi Behavioral Risk Factor Surveillance System (BRFSS) Reports

4. EXISTING CONDITIONS & TRENDS

Other indicators of healthy food access include the distance households are from the nearest grocery store and the percent of households that have a fruit or vegetable garden. Results from *The Kaua'i Resident Travel Survey* show that:

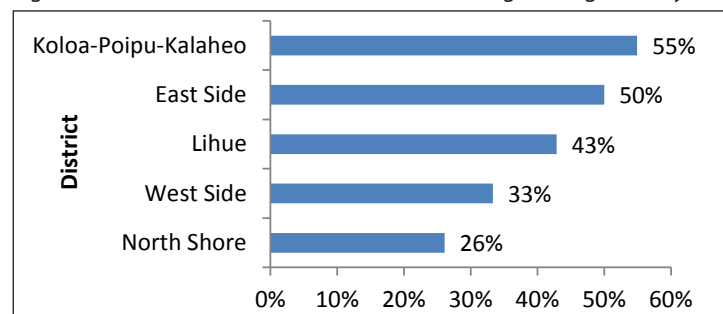
- The average distance to the nearest grocery store for Kaua'i residents is 3.1 miles.
- Residents in Lihue and the West side on average are closer to a grocery store than residents in other districts in the island (see Figure 4-31).
- 45% of Kaua'i households reported having a fruit or vegetable garden.

Figure 4-31: Average distance households are to a grocery store by district



Source: Kaua'i Resident Travel Survey, 2011

Figure 4-32: Percent of households with a fruit/vegetable garden by district

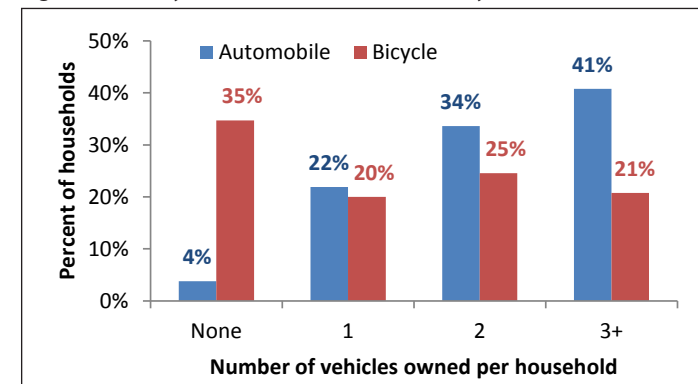


Source: Kaua'i Resident Travel Survey, 2011

Active Transportation Access

The use and accessibility of active transportation, including access to walking and biking can strongly impact physical activity levels. One important indicator of active transportation accessibility is bicycle ownership levels. Based on results from *The Kaua'i Resident Travel Survey*, residents reported owning an average of 1.4 bicycles per household, which is much lower than the average of 2.4 motor vehicles per household. Additionally, approximately 35% of households in Kaua'i do not own a bicycle, while only 4% of households do not own a motor vehicle (see Figure 4-33). This indicates that most residents have better access to a car than a bicycle.

Figure 4-33: Bicycles vs. automobiles owned by household in Kaua'i



Source: Kaua'i Resident Travel Survey, 2011

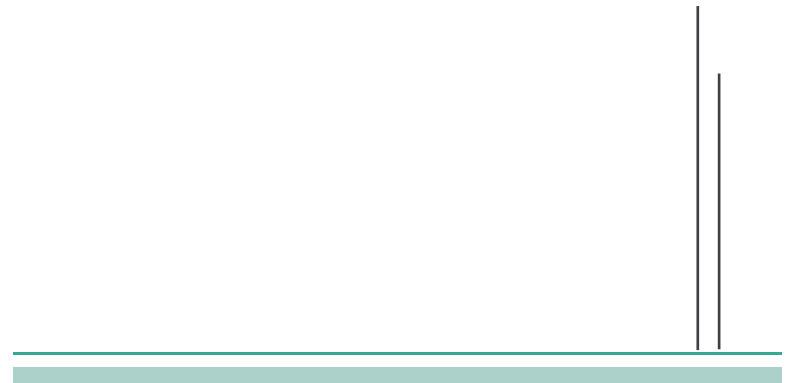
*** Note:** While this plan was in a final draft stage, the Hawai'i Department of Business, Economic Development and Tourism (DBEDT) released its 2011 Hawai'i Data Book. The new data suggests more rapid growth in "de facto" population and vehicle miles traveled (VMT) on Kaua'i occurred between 2010 and 2011 than has been the trend. The significant and unexpected increases in resident population, visitors and VMT, if accurate, highlight the importance of implementing this plan. The performance monitoring system described in Chapter 7 will enable the County to monitor and react to these trends over time.

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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 5 FORECASTS & FUTURE SCENARIOS



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5. FORECASTS & FUTURE SCENARIOS

Purpose of This Chapter

This chapter is designed to describe the simplest, most direct way the County could achieve the objectives set forth in Chapter 2. It uses forecast data and the trajectories of key variables between now and 2035 to show what level of intervention in trends would be required to deliver the vision described in the County's 2000 General Plan.

It is important to note that forecasts are not predictions. The purpose of forecasting is to identify one or more alternative (feasible) futures, to test what strategies and measures would be required to achieve the alternative futures, and to describe the implications of the different possible outcomes. To keep this plan as simple and clear as possible, only two forecast scenarios were identified. The objective was to “bookend” the likely range of possible futures. The Baseline Scenario couples current data for travel behavior with a “mid-range” population forecast to show the implications of current trajectories – vehicle traffic, energy consumption, accidents and so forth. The Preferred Scenario is designed to achieve the Chapter 2 objectives and County General Plan vision, primarily by preventing further growth in island vehicular traffic. Neither the Baseline Scenario nor the Preferred Scenario is likely to come to pass. The actual outcome will probably be somewhere between the two, although there is also the po-

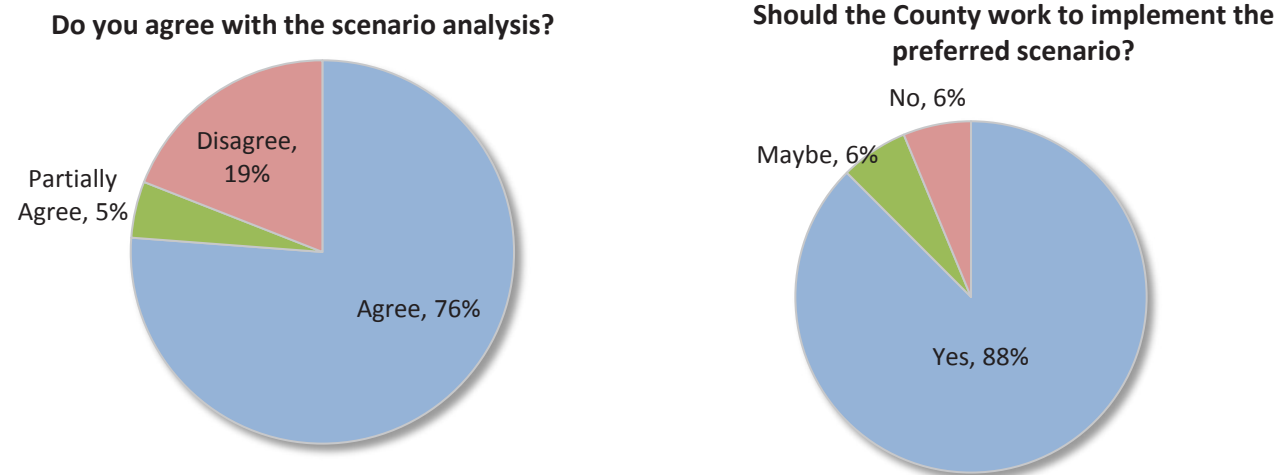
tential that future events could take a completely unanticipated turn and land somewhere outside the “book ends.”

These scenarios were presented to the public at public workshops held in February 2012. (See Chapter 3 for a description of the public involvement in developing this plan.) The Preferred Scenario was broadly supported by those attending the workshops (see Figure 5-1). Achieving a future close to the Preferred Scenario would not be easy or non-controversial, as will be seen from the data presented below.

Methodology and Sources

The underlying population forecast used in this chapter was derived from household and hotel unit forecasts by traffic analysis zone (TAZ) from the Hawai'i Department of Transportation (DOT) in conjunction with the County of Kaua'i General Plan. More detailed information about the forecasting methodology and data sources, as well as specifics of the scenario calculations can be found in Appendix D.

Figure 5-1: Answers to the comment cards about the scenario analysis distributed at the February, 2012 public workshops



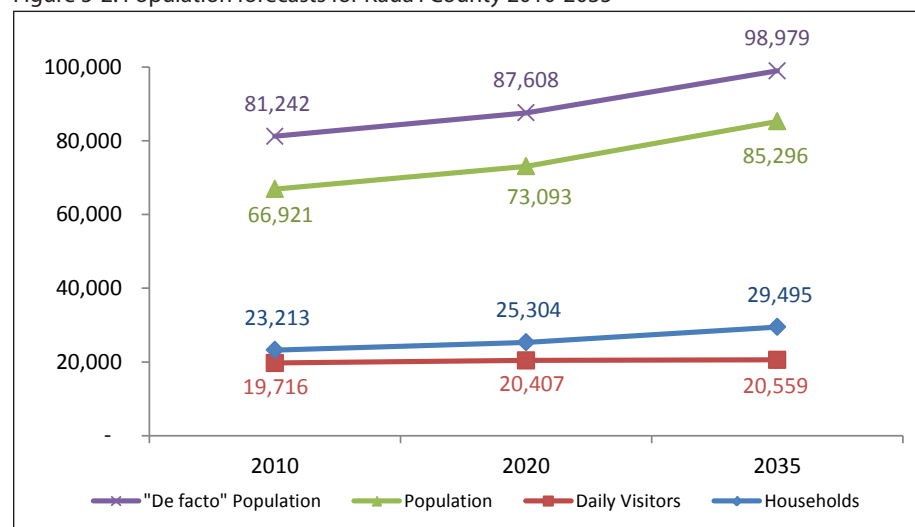
5. FORECASTS & FUTURE SCENARIOS

2020 & 2035 POPULATION FORECASTS

Figure 5-2 illustrates the mid-range (through 2020) and long-range (through 2035) “de facto” population forecasts for Kauaʻi County. The de facto population in Kauaʻi (which is the average residents and visitors present on any given day) is expected to grow by 21% between 2010 and 2035 from about 81,000 people to 99,000 people. The visitor population is only expected to grow by about 4% during that time.¹ Therefore most of the de facto population growth will result from an increase in the resident population.

Table 5-3 shows the de facto population forecasts by district. Almost half of the de facto population growth expected in Kauaʻi through 2035 will be in the Lihue district. Most of the rest of the growth is expected to occur in the Kōloa-Poʻi-pū-Kalāheo and East Side districts, and much less population growth is expected in the North Shore and West Side. Given that the average daily miles traveled per person varies significantly by district (see chapter 4), population growth by district will impact VMT projections for Kauaʻi.

Figure 5-2: Population forecasts for Kauaʻi County 2010-2035



¹ See note at the end of this chapter (page 5-10) about changes in population trends from 2010-2011

Table 5-1: Population forecasts by district, 2010-2035

District	2010	2020	2035	2010-2035 % Change
West Side	11,722	12,171	13,619	16%
Kōloa-Poʻi-pū-Kalāheo	11,696	12,999	16,150	38%
Lihue	14,683	17,751	22,223	51%
East Side	20,813	22,165	24,626	18%
North Shore	8,007	8,007	8,678	8%
Total	66,921	73,093	85,296	27%

Table 5-2: Daily visitors present forecasts by district, 2010-2035

District	2010	2020	2035	2010-2035 % Change
West Side	245	293	354	44%
Kōloa-Poʻi-pū-Kalāheo	7,197	7,356	7,447	3%
Lihue	3,420	3,747	3,747	10%
East Side	4,281	4,439	4,439	4%
North Shore	4,572	4,572	4,572	0%
Total	19,716	20,407	20,559	4%

Table 5-3: “De facto” population forecasts by district, 2010-2035

District	2010	2020	2035	2010-2035 % Change
West Side	11,022	11,483	12,875	17%
Kōloa-Poʻi-pū-Kalāheo	17,950	19,307	22,295	24%
Lihue	16,920	20,067	24,179	43%
East Side	23,416	24,818	27,080	16%
North Shore	11,934	11,934	12,551	5%
Total	81,242	87,608	98,979	22%

5. FORECASTS & FUTURE SCENARIOS

A TALE OF TWO SCENARIOS

Given the rate of population growth expected through 2020 and 2035 two future scenarios with different performance objectives for travel behavior were developed for comparison, each with different planning implications:

The Baseline Scenario: In this scenario there would be no change in travel behavior, physical activity levels, or the vehicle collision fatality rate between 2010 and 2035. VMT per capita and mode share would not change significantly under this scenario.

The Preferred Scenario: The performance targets for this scenario are that total island-wide annual VMT in Kaua'i would remain at 2010 levels through 2035, that the vehicle collision rate would decrease, and physical activity levels in Kaua'i would increase through 2035. Assuming population forecasts are correct, annual VMT per capita would need to gradually decrease through 2035 and more trips would need to be made by walking, biking and transit, and fewer trips by driving. As is apparent from the data presented in this chapter, the outcomes of the Preferred Scenario are much more in line with the vision and goals outlined in chapter 2 than the Baseline Scenario. Therefore the Preferred Scenario outcomes for 2020 and 2035 will be used to establish a policy target for the County to implement this plan.

The following key performance monitoring indicators were used to analyze the performance outcomes in 2020 and 2035 given each of the two scenarios:

- Annual VMT (Vehicle Miles Traveled)
- Per Capita VMT
- Annual Motor Fuel Consumption
- Per Capita Motor Fuel Consumption
- GHG (Greenhouse Gas) Emissions
- Vehicle Collision Rate
- Mode Share
- Transit Ridership
- Physical Activity Levels
- Annual Household Transportation Costs

Baseline Scenario Performance Targets

- **No change in travel behavior from 2010-2035**
- **No change in fatality rate from vehicle collisions from 2010-2035**
- **No change in adult physical activity level from 2010-2035**

Preferred Scenario Performance Targets

- **Total island-wide VMT will remain at 2010 levels**
- **Fatality rate from vehicle collisions would be reduced by 10% by 2020 and by 15% by 2035**
- **Physical activity levels would increase 14% by 2020 and 31% by 2035**

The outcomes of these indicators, detailed in the following pages, will help to illustrate how effectively the goals and objectives of this plan would be reached in 2020 and 2035 under each scenario.

Highlights:

- **Average household transportation costs** will increase by 15% in the Baseline Scenario, but decrease by 6% in the Preferred Scenario from 2010-2035
- **Annual VMT per capita** will decrease by 3% in the Baseline Scenario, but will decrease by 18% in Preferred Scenario from 2010-2035
- **Single-occupant vehicle mode share** will remain the same in the Baseline Scenario, but will decrease by 28% in the Preferred Scenario from 2010-2035
- **Weekday transit trips** will increase by 71% in the Baseline Scenario and will increase by about 1,000% in the Preferred Scenario from 2010-2035

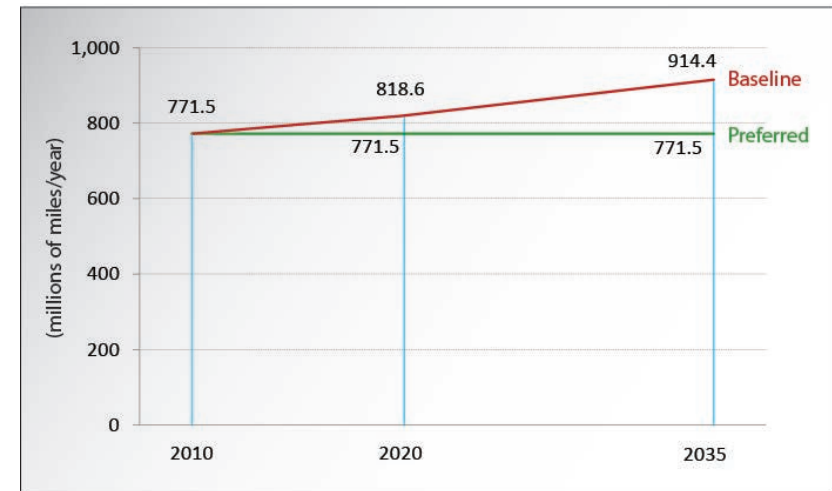
5. FORECASTS & FUTURE SCENARIOS

VMT (Vehicle Miles Traveled)

In the Baseline Scenario . . . the average person in Kauaʻi would drive the same amount of miles per year in 2020 and 2035 as they did in 2010.² In this scenario total annual VMT would increase as resident and visitor population increases.

In the Preferred Scenario . . . total annual VMT in Kauaʻi would remain at 771.5 million through 2035 despite an increase in population. This means traffic levels in Kauaʻi would not increase over the next 25 years.

Figure 5-3: Annual VMT (vehicle miles traveled)

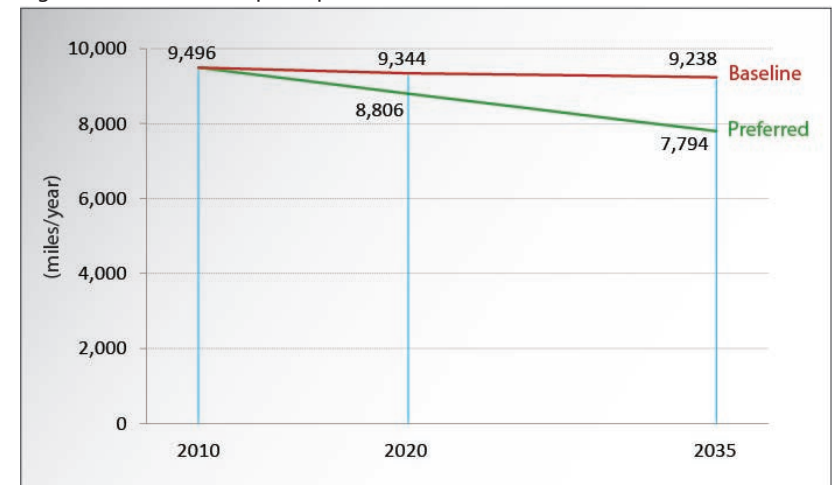


VMT per Capita³

In the Baseline Scenario . . . average per capita annual VMT would remain very close to 2010 levels, which was 9,496 VMT per person.⁴ There would be a slight decrease in per capita VMT through 2035 because more population growth is expected to occur in areas of Kauaʻi where people tend to drive less (the Lihuʻe, Kōloa-Poiʻpū-Kalāheo, and East Side districts).

In the Preferred Scenario . . . to hold island-wide VMT at 2010 levels, annual VMT per capita would need to decrease from 9,496 in 2010 to 7,794 in 2035.

Figure 5-4: Annual VMT per capita



² See note at the end of this chapter (page 5-10) about 2011 VMT data

³ Per "de facto" population.

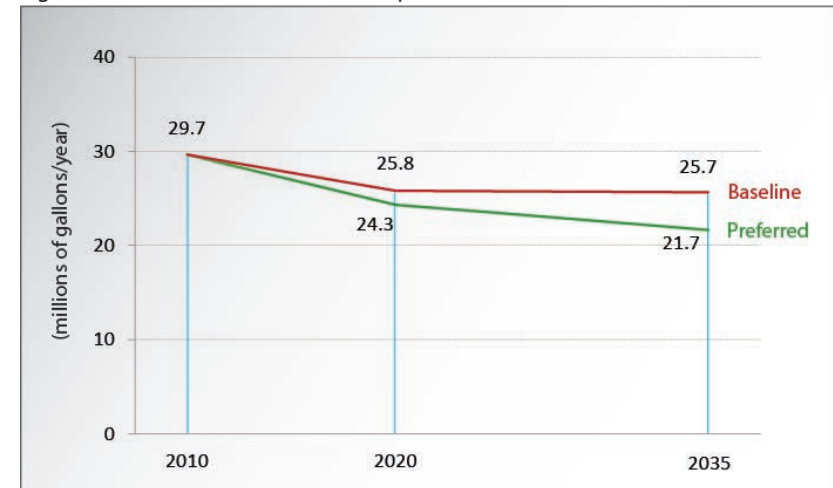
⁴ See note at the end of this chapter (page 5-10) about 2011 VMT per capita data

Motor Fuel Consumption

In the Baseline Scenario . . . total annual motor fuel consumption would decrease from 29.7 million gallons in 2010 to 25.7 million gallons in 2035 because the forecast increase in vehicle fleet fuel efficiency would outweigh the expected increase in total VMT. Motor fuel consumption is dependent both on how much people drive (VMT) and on how fuel efficient their vehicles are (mpg). Both scenarios assume the vehicle fleet average fuel economy in Kaua'i would increase from 26 mpg in 2010 to 35 mpg in 2035.

In the Preferred Scenario . . . total annual motor fuel consumption would decrease more than in the Baseline Scenario, from 29.7 million gallons in 2010 to 21.7 million gallons in 2035 because the vehicle fleet fuel efficiency would increase while total annual VMT in Kaua'i would remain the same.

Figure 5-5: Annual motor fuel consumption

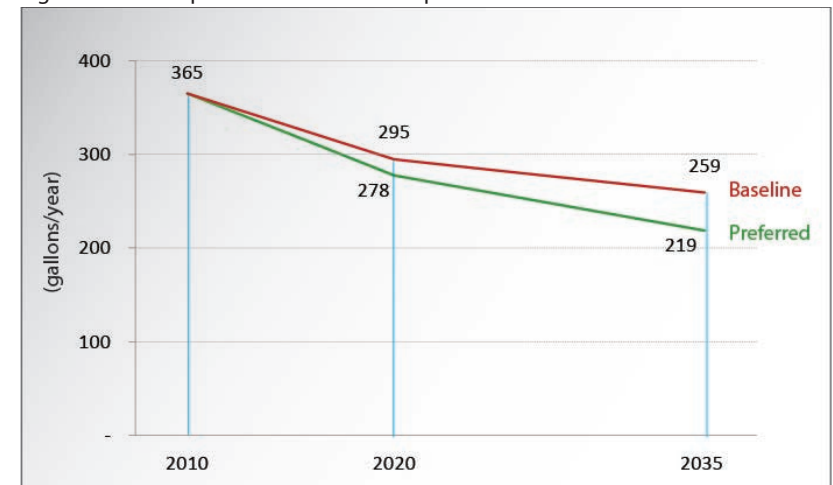


Per Capita Motor Fuel Consumption

In the Baseline Scenario . . . annual motor fuel consumption per capita is expected to decrease from 365 gallons per person in 2010 to 259 gallons per person in 2035 mostly because the vehicle fleet average fuel economy in Kaua'i is expected increase from 26 mpg in 2010 to 35 mpg in 2035.

In the Preferred Scenario . . . annual motor fuel consumption per capita would decrease more significantly than in the Baseline Scenario, from 365 gallons per person in 2010 to 219 gallons per person in 2035 because both the vehicle fleet fuel efficiency would increase and per capita VMT in Kaua'i would decrease because people would be driving less.

Figure 5-6: Per capita motor fuel consumption



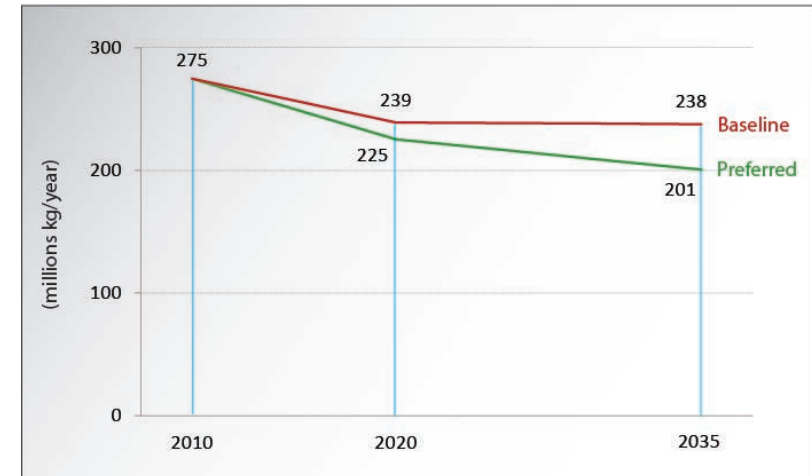
5. FORECASTS & FUTURE SCENARIOS

Greenhouse Gas Emissions (GHG's) from Ground Transportation

In the Baseline Scenario . . . annual GHG emissions from ground transportation would decrease from 275 million kg in 2010 to 238 million kg in 2035 because total annual motor fuel consumption would decrease as vehicles become more fuel efficient.

In the Preferred Scenario . . . annual GHG emissions from ground transportation would decrease more than in the Baseline Scenario, from 275 million kg in 2010 to 201 million kg in 2035

Figure 5-7: Greenhouse Gas Emissions (GHG's) from Ground Transportation

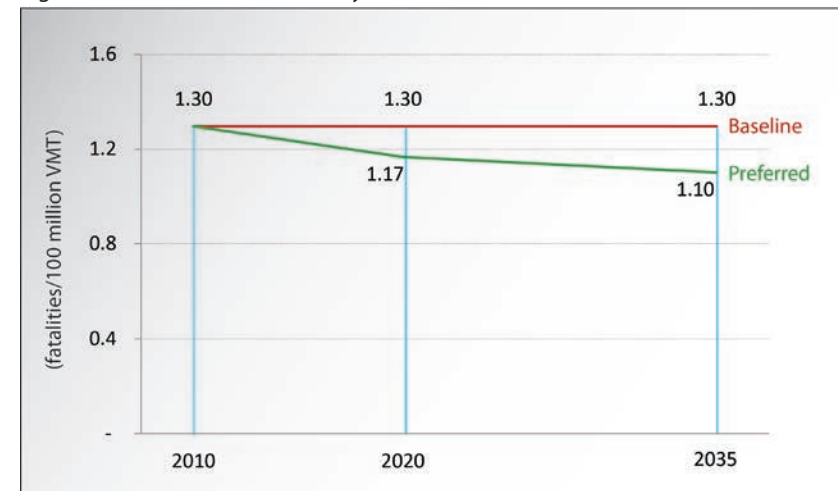


Vehicle Collision Fatality Rate

In the Baseline Scenario . . . the rate of fatalities resulting from vehicle collisions would remain the same through 2035 as it was in 2010, an average of 1.30 fatalities per 100 million VMT.⁵

In the Preferred Scenario . . . the rate of fatalities resulting from vehicle collisions would reduce by 10% through 2020 and by 15% through 2035 dropping to an average of 1.10 fatalities per 100 million VMT.

Figure 5-8: Vehicle collision fatality rate



⁵ It should be noted that 1.3 fatalities per 100 million VMT was also the 5-year average from 2006-2010

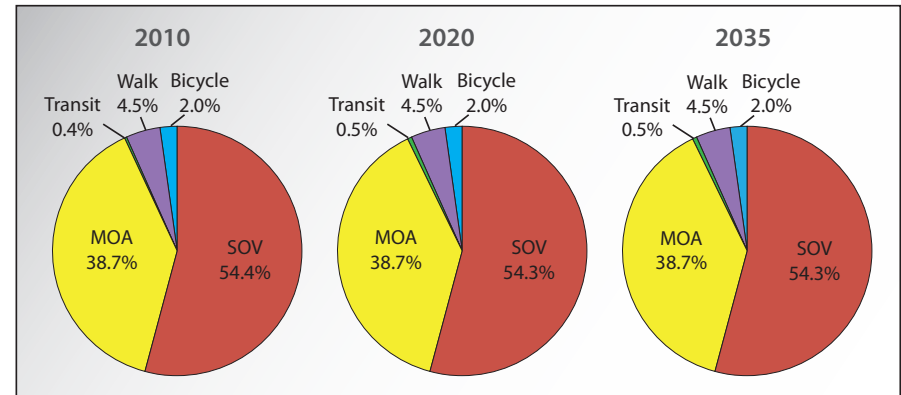
Mode Share

In the Baseline Scenario . . . mode share is expected to stay the same in 2020 and 2035 as it is today. Because population is expected to increase, this would result in an increase in traffic (VMT) through 2035.

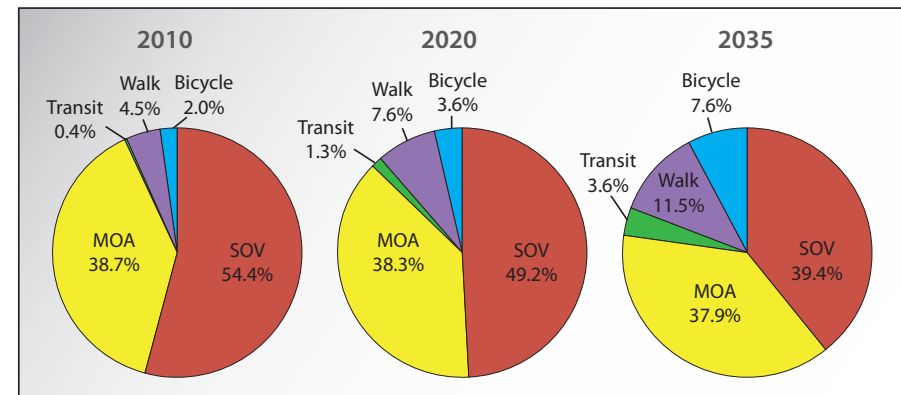
In the Preferred Scenario . . . future mode share projections are based on the goal of no net increase in VMT. The Preferred Scenario pie charts in Figure 5-9 show the mode share that would be necessary in 2020 and 2035 in Kaua'i if total VMT were held at the 2010 level while maintaining current levels of mobility (meaning total miles traveled is the same in 2020 and 2035 as 2010). In this scenario a much higher percentage of people would be walking, biking and using transit in 2035 than 2010 and a lower percentage of trips would be made by single occupant vehicle (SOV).

Figure 5-9: Mode share

Baseline Mode Share - All Trips



Preferred Mode Share - All Trips



* SOV = Single-Occupant Vehicle, MOA = Multiple-Occupant Auto

5. FORECASTS & FUTURE SCENARIOS

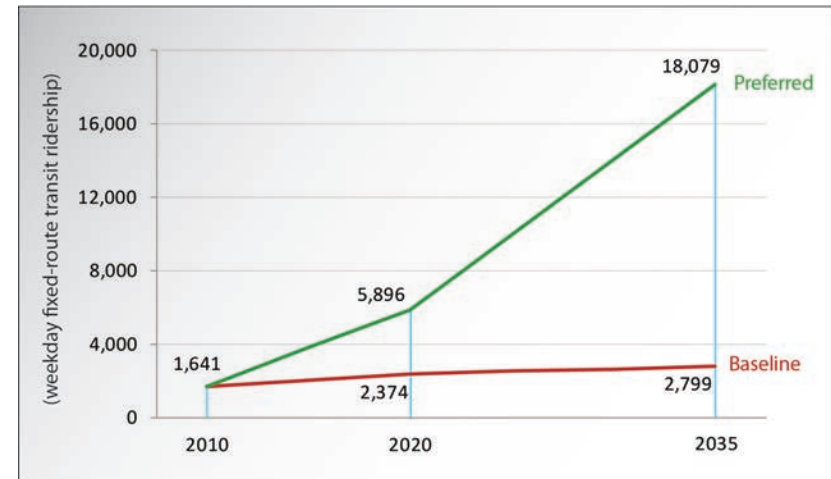
Transit Demand

For both scenarios transit demand is based on the projected transit mode share. Assuming the average number of trips a person takes per day (5.0) will be the same in 2020 and 2035 as it was in 2010, Figure 5-10 illustrates how changes in transit mode share would impact transit demand.

In the Baseline Scenario . . . weekday transit ridership would increase minimally through 2035 because transit mode share would remain the same. The slight increase in transit demand would be entirely attributed to population increase.

In the Preferred Scenario . . . weekday fixed-route transit ridership would increase by over 1,000% between 2010 and 2035 to around 18,000 weekday riders because the transit mode share would increase from 0.4% to 3.6%.

Figure 5-10: Transit demand



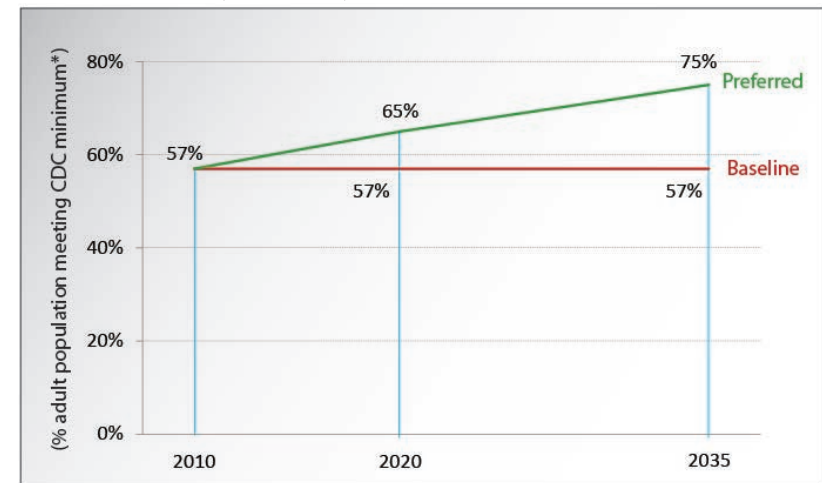
Adult Physical Activity

Walking and biking are both considered “active transportation.” The amount of walking and biking residents partake in will impact physical activity levels among the population.

In the Baseline Scenario . . . adult physical activity levels would not change from what they were in 2010.

In the Preferred Scenario . . . physical activity levels are expected to increase, at least in part, as a result of an increase in the walk and bicycle mode shares.

Figure 5-11: Adult physical activity



*The Center for Disease Control (CDC) recommends that adults get a minimum of 2.5 hours of moderate physical activity per week

5. FORECASTS & FUTURE SCENARIOS

Annual Transportation Costs per Household

Transportation costs per household will primarily be determined by the price of gas, VMT and vehicle fuel economy. In both scenarios the cost of driving per mile is expected to increase because the price of gas is forecast to increase (see Table 5-4).

In the Baseline Scenario . . . the annual transportation costs per household in Kaua'i (in 2010 dollars) would increase from about \$14,900 in 2010 to about \$17,000 in 2035 because the price of gas is expected to increase from \$3.49 per gallon to \$7.88 per gallon and households would be driving the same amount. Given that over 50% of households in Kaua'i were already spending more than 50% of their income on housing and transportation (H+T) in 2010 (see data presented in Chapter 4), these transportation cost increases will make H+T costs unaffordable to an even larger percentage of the population. This would be especially true for households in the West Side who are already spending more of their income on transportation than any district in Kaua'i.

In the Preferred Scenario . . . the annual transportation costs per household in Kaua'i would decrease from \$14,900 in 2010 to \$13,900 in 2035 because, based on future mode share, people would be driving less and walking, biking and using transit more under this scenario than they would in the Baseline Scenario. The costs associated with using these other modes of transportation are expected to be significantly less expensive per mile than driving. Under this scenario, transportation costs would become more affordable to a greater percentage of households despite an increase in the cost of petroleum fuel.

Figure 5-12: Annual household transportation costs

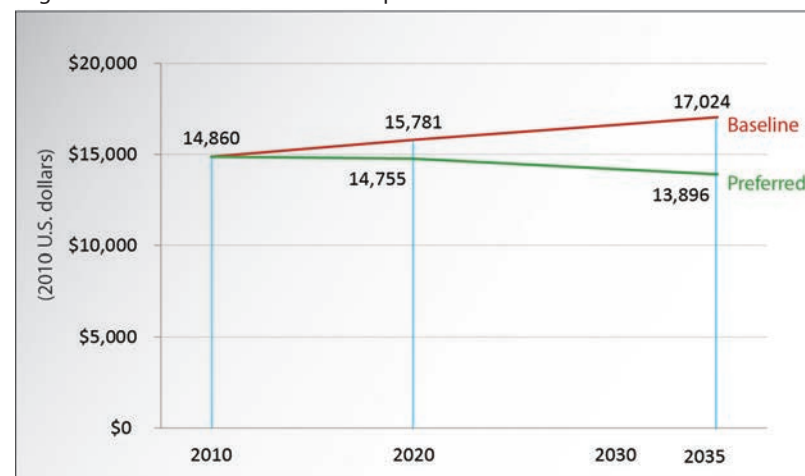


Table 5-4: Forecast of the price of oil and gasoline for 2020 and 2035

Forecast Type	2020			2035		
	U.S. Oil Price (per barrel) ¹	U.S. Gas Price (per gallon) ²	Hawai'i Gas Price (per gallon) ³	U.S. Oil Price (per barrel) ¹	U.S. Gas Price (per gallon) ²	Hawai'i Gas Price (per gallon) ³
Low Range	\$65.00	\$2.51	\$3.14	\$82.00	\$2.99	\$3.74
Mid Range	\$130.00	\$4.35	\$5.44	\$199.00	\$6.30	\$7.88
High Range	\$203.00	\$6.42	\$8.02	\$322.00	\$9.78	\$12.23

¹ U.S. Energy Outlook 2011, Energy Information Agency, September, 2011

² Derived using EIA formulas for crude oil to gas relationships [U.S. Retail Gas Price (regular) = \$0.67426 + (0.028287 x oil price)]

³ Derived from U.S. gas prices using historical averages [Hawai'i Gas Price = 1.25 x U.S. Gas Price]

Table 5-5: Annual household transportation costs by mode

Year	Assumptions			Baseline Scenario						Preferred Scenario					
	Gas \$ per gal (2010 dollars)	Avg. Fleet mpg	Driving Cost per Mile	HH VMT	Driving Costs	Transit Costs	Bicycle Costs	Total Trans Costs	% Median Income	HH VMT	Driving Costs	Transit Costs	Bicycle Costs	Total Trans Costs	% Median Income
(Average per household per year in 2010 dollars)															
2010	\$3.49	26.0	\$0.59	25,092	\$14,791	\$31	\$37	\$14,860	24%	25,092	\$14,791	\$31	\$37	\$14,860	24%
2020	\$5.44	31.7	\$0.63	25,050	\$15,702	\$42	\$37	\$15,781	25%	23,262	\$14,581	\$109	\$65	\$14,755	24%
2035	\$7.88	35.6	\$0.68	25,050	\$16,945	\$42	\$37	\$17,024	27%	19,901	\$13,462	\$295	\$139	\$13,896	22%

5. FORECASTS & FUTURE SCENARIOS

Planning Implications

The Preferred Scenario is based on the simple strategy of no net increase in total annual VMT in Kaua'i from 2010 levels. Despite its simplicity, implementation of the Preferred Scenario would result in far reaching outcomes (see Table 5-6) that support many of the goals of this plan (see chapter 2). These include:

- Reduced energy consumption;
- No increase in traffic levels (reducing the need to widen roads);
- Reduced household transportation costs;
- Increased levels of physical activity; and
- An increase in the use of the non-driving modes of transportation, including walking, biking and transit.

The 2020 and 2035 Preferred Scenario indicators presented in this chapter will serve as policy targets for the County to achieve the goals and objectives of this plan and the transportation vision of the County General Plan.

The programs described in the next chapter (Chapter 6) and the short term implementation strategy described in Chapter 7 are designed to achieve the Preferred Scenario.

Table 5-6: 2035 Baseline and Preferred Scenario outcomes by indicator

Indicator	2010 Level	Difference between 2010 and 2035	
		Baseline	Preferred
Annual VMT (Vehicle Miles Traveled)	771.5 million	↑19%	0%
Annual VMT per Capita	9,496	↓3%	↓18%
Annual Gallons of Motor Fuel Consumed	29.7 million	↓13%	↓27%
Annual Gallons of Motor Fuel Consumption per Capita	365	↓29%	↓40%
Annual GHG Emissions from Ground Transport (kg)	274 million	↓13%	↓27%
SOV* Mode Share	54.4%	0%	↓28%
MOA* Mode Share	38.7%	0%	↓2%
Transit Mode Share	0.4%	↑32%	↑839%
Walk Mode Share	4.5%	0%	↑156%
Bike Mode Share	2.0%	0%	↑274%
Fatalities from Motor Vehicle Collisions per 100 Million VMT	1.30	0%	↓15%
Weekday Transit Ridership	1,641	↑71%	↑1,002%
% of Adults Meeting the Minimum Levels of Physical Activity**	57%	0%	↑32%
Average Annual Household Transportation Costs	\$ 14,860	↑15%	↓6%

*SOV - Single Occupant Vehicle, MOA - Multiple Occupant Auto

** The CDC recommends adults get 30 minutes of moderate exercise 5 days a week to maintain a healthy lifestyle

Note: While this plan was in a final draft stage, the Hawai'i Department of Business, Economic Development and Tourism (DBEDT) released its 2011 Hawai'i Data Book. The new data suggests more rapid growth in "de facto" population and vehicle miles traveled (VMT) on Kaua'i occurred between 2010 and 2011 than was forecast in the Baseline Scenario. The significant and unexpected increases in resident population, visitors and VMT, if accurate, highlight the importance of implementing this plan. The performance monitoring system described in Chapter 7 will enable the County to monitor and react to these trends over time.

Kaua'i

Multimodal Land Transportation Plan

CHAPTER 6 PROGRAMS

A. TRANSIT

B. BICYCLE

C. PEDESTRIAN

D. COUNTY ROADS

E. AGRICULTURE TRANSPORTATION

F. LAND USE



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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 6A TRANSIT PROGRAM

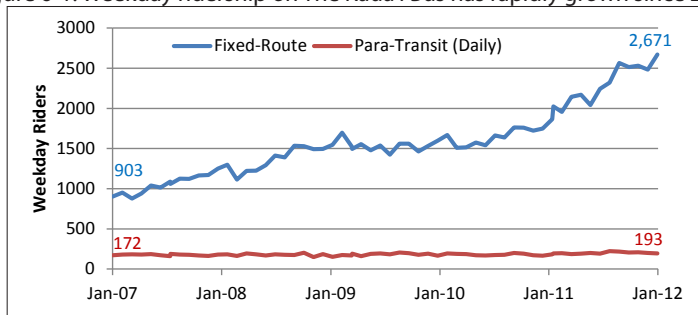


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TRANSIT PROGRAM SUMMARY

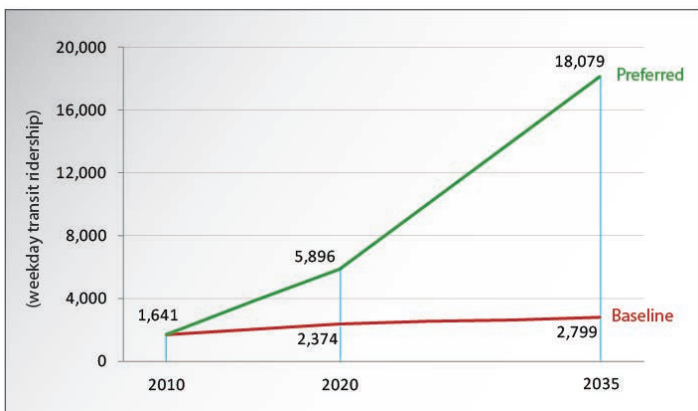
Ridership on The Kaua'i Bus has grown rapidly since 2007 (Figure 6-1) and demand has begun to match or exceed supply on key routes. Achieving the vision and goals outlined in Chapter 2 will require further substantial increases in ridership – the 2035 transit mode share policy target is nearly 4% of daily trips. (See Preferred Scenario in Figure 6-2.) Reaching this level will require a mix of strategies, which provide the basis for the transit program components shown on the right: increasing operating efficiency, increasing operating revenue, increasing external funding, increasing county transit appropriations, and using the savings and increased funding to ramp up transit service levels.

Figure 6-1: Weekday ridership on The Kaua'i Bus has rapidly grown since 2007



Source: Kaua'i County Transportation Agency

Figure 6-2: The County's policy target for the transit program will be to meet the transit demand of the Preferred Scenario



Summary of Transit Program Components

Bus Stops

- Continue to install shelters
- Improve pedestrian access
- Apply accessibility design criteria
- Add passenger amenities

Operating Revenue

- Update monthly pass rates
- Develop a discounted, bulk-rate commuter pass
- Modernize onboard fare collection

Digital Services

- Implement GPS bus locator system
- Develop on-line GPS tracking
- Implement Wi-Fi on buses and at stops

Marketing & Information

- Improve maps and schedules
- Migrate maps, schedules and pass program to Internet
- Begin marketing to visitors

Improve Commuter (mainline) Routes

- Increase service frequencies
- Extend hours of service
- Relocate stops to the highway
- Replace appropriate route(s) with circulators
- Upgrade fleet to larger buses

Improve Local Circulators (shuttles)

- Update routes based on demand and efficiency
- Improve service levels

Initiate New Local Circulators (shuttles)

- Develop performance criteria for routes
- Implement new local transit shuttles

Convert Fleet to Sustainable Power

- Implement short term conversion to B20 (biodiesel)
- Coordinate with other agencies to identify a long range solution

Bus Maintenance and Storage Facilities

- Identify locations for new storage facilities on West Side & North Shore
- Compete for capital grants to fund facility additions and upgrades
- Develop a site plan and design to retrofit the Lihue bus maintenance and storage facility

Park'n Rides

- Develop selected new park 'n rides

Transit Planning

- Develop short- and mid-range operations plans

Routine Bus Maintenance

Routine Facility Maintenance

Operations & Management

- Anticipate and budget for growth

Other Actions

- Investigate feasibility of onboard surfboard and luggage storage, and increased bike capacity

BACKGROUND

Demand for transit service in Kaua'i has grown rapidly since 2005. Between 2006 and 2011 the County of Kaua'i Transportation Agency that operates The Kaua'i Bus (TKB) implemented incremental increases in transit service in response to demand, as evidenced by the resulting ridership gains. Between 2007 and 2011 ridership on the TKB fixed-route more than doubled from an annual average of about 1,000 weekday riders to 2,200 weekday riders. Between January, 2011 and January, 2012 ridership grew by nearly 50% from a monthly average of 1,870 weekday riders to 2,670 weekday riders (see Figure 6-1).

Recent ridership growth clearly illustrates that demand for transit service in Kaua'i is increasing. This trend is driven by rising costs of auto travel, rising housing costs, and the recession – all of which have placed pressure on household budgets. As the scenario analysis in Chapter 5 shows, the combined cost of transportation and housing for many of Kaua'i's households exceeds levels that are financially sustainable, a problem that will be exacerbated by rising fuel costs over the coming decades. Accordingly, demand for transit as a lower cost alternative to driving will impel further ridership increases, challenging the County's ability to respond with required transit service levels.



The nature of this challenge is primarily financial. The County of Kaua'i Transportation Agency currently has no funding to expand transit service to the levels needed to meet demand. Ridership growth has already been outpacing the agency's ability to grow its fleet and facilities. In recent years the County has used all of its formula-based annual federal transit funding, which is intended for capital improvements, to fund operations and maintenance costs. To accommodate 6,000 rides per day in 2020 and 18,000 rides per day in 2035, the County will apply the following financial strategies. (See specific program descriptions on following pages for details.)

- **Increased Operational Efficiency.** As shown in Chapter 4, TKB has high operational efficiencies relative to its peer agencies nationally. However, further improvements in cost effectiveness are achievable from streamlining mainline routes, deploying larger buses on some routes, and reducing deadhead mileage.
- **Increased Operating Revenue.** The County will work to increase fare, pass and other operating revenues through programs that grow income without discouraging ridership.
- **Increased External Funding.** The County will continue to aggressively compete for federal funding for capital investments. The County will also work with landowners and developers to provide site-specific capital investments. Finally, the County will work with the tourism industry and other private sector elements to provide funding for specific service increases (such as new circulators).
- **Increased County Appropriations.** Remaining gaps in funding required to meet the ridership and mode share targets by 2020 and 2035 will be met by increased appropriations of County general fund revenues or by development of new County revenue sources.



6A. TRANSIT PROGRAM

GENERAL PROGRAM BY 2035:

Bus Stops

Bus stops and transit vehicles are the two most visible aspects of the TKB transit system. What people see through their windshields has a major influence on how aware of and interested in transit they are. Bus stop improvements provide significant benefits in the quality, convenience and appeal of transit service for passengers. A major component of the mayor's Holo Holo 2020 program for Kaua'i includes installing shelters at every bus stop. Installation of shelters at bus stops also received some of the strongest support from the public during the planning process and will mitigate Kaua'i's sun and rain conditions substantially for passengers waiting for the bus.



Additionally, other bus stop improvements, such as improving sidewalks and crosswalks around bus stops also received strong support during this plan's public planning process, particularly from the TKB onboard survey (see Appendix F), and the upgrades will be equally important to making bus stops more functional for users. These improvements will include pedestrian street crossings; ADA-compliant waiting and queuing areas, access sidewalks and walkways; concrete bus pads to mitigate damage to pavements; and improved lighting and passenger amenities (trash cans, Wi-Fi access, etc.). Depending on traffic flow and street configuration, bus pullout bays may be appropriate at some locations. Implementation will be based on a prioritization system that accounts for the relative number of boardings at each stop location and other planning factors (for example, temporary stops will not be prioritized for upgrades).

Operating Revenue

To increase net revenue and encourage continued growth in transit patronage TKB will:

- **Revise and update monthly pass rates to be more in line with cash fares.** Most transit agencies price monthly passes between 25 and 35 times the single-ride rate. Because this rate structure provides discounts to everyday riders, monthly passes would continue to be an attractive choice for everyday riders of TKB and this pricing will provide additional revenue for TKB.
- **Implement a discounted, bulk-rate commuter pass.** Examples of commuter pass programs include "Eco Pass" in Denver and the "ORCA Pass" in Seattle. Under these programs, annual transit passes are sold to employers under the condition that employers purchase a pass for each employee. Because not every employee will use the pass (and some will use the pass infrequently) passes can be sold at a deep discount without loss of net revenue to the transit agency. Employers benefit by being able to offer an additional benefit to employees that is tax deductible and will reduce the number of employee parking spaces needed. Employees save money on transportation costs and benefit by having more transportation options. The general public benefits from reduced auto traffic. For TKB, this type of pass program would both increase net revenues and increase ridership.

TKB may also extend the discounted, bulk-rate pass program to Kaua'i Community College (KCC) students. TKB's eleven month pilot program (from August, 2011 to June, 2012) that allowed KCC students to use their student ID as a bus pass was popular and resulted in increased ridership on TKB during that time. There are many examples of university transit pass programs, including the "U-Pass" in Seattle, Chicago, and O'ahu (through the University of Hawai'i) upon which to model such a pass program.

6A. TRANSIT PROGRAM

- **Modernize onboard fare collection.** TKB will transition away from reliance on cash fares by implementing a “smart card” system. The operational efficiencies inherent in smart cards as a replacement for cash fares represents a key opportunity for TKB. Smart cards reduce travel times by speeding the boarding process, and will lower operating costs while improving service. Smart cards will replace TKB’s existing passes, expanding available options and reducing administrative costs. This modernization of the payment system (no more struggling to find exact change) will appeal to a broader commuting market, as well as to the visitor market.

Digital Services

To build ridership and general public support, and to lower operating costs, the County will implement digital services that improve access to transit service information and encourage ridership among people who are “digitally savvy” – a growing part of the population. These services will include providing GPS-based route and schedule information and real-time bus location information. The latter will be accomplished by installing GPS tracking units in buses to determine the location of each bus and to record the position of the bus at regular intervals. The location data will be transmitted to a central location database, or internet-connected computer, using a cellular, radio, or satellite modem embedded in the unit. This will allow the location of each bus to be displayed against a map backdrop in real time. This will also support “next bus” software and hardware systems that display when the next bus on a specific route will arrive at a specific stop, either on displays at bus stops or via an internet connection. In addition to improving user amenities, GPS tracking devices will allow TKB to more efficiently and cost effectively manage its fleet, including tracking bus mileage, average speed, location and other data that could be used to improve operations. Finally, TKB will install Wi-Fi transmitters at bus stops and on buses to provide internet access to riders, both for general use and for access to on-line transit information services.



Marketing & Information

The County will use marketing and related services to improve public access to information about The Kaua'i Bus services – routes, schedules, fares and passes, and changes in service. Marketing will be focused in two areas: announcing and promoting new services, added features and other changes in operations; and routine, ongoing provision of information about the transit system. TKB will utilize a variety of media to market to different audiences, including some limited marketing of bus services in specific tourism markets where transit services will be of potential use to visitors (e.g., Kōloa–Poi'pū, Kapa'a–Lihue, and Princeville–Hanalei). Marketing will include such techniques as traditional news outlets (radio and newspaper), sponsorship of local events, use of online “social media,” placement of displays and information in visitor guides, and making information available to hotels for guests. A key component of this strategy will be an enhanced web presence for The Kaua'i Bus that is not embedded within the County's general website. Improved information access through the TKB website will support a range of customer services, including pass sales, commuter toolkits, rider feedback and comments, and trip planning features.

Improve Commuter (Mainline) Routes

TKB's longer commuter routes are the backbone of the County transit network, attracting the bulk of daily ridership, with some routes often running at capacity. Over the mid term (by 2020), TKB will place priority on improvements that benefit weekday commuters, because that is where the greatest demand growth has been. Over time, other changes, such as increased weekend service will also be implemented.



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Specific improvements to the four mainline routes (Kekaha-Līhu'e, Hanalei-Līhu'e, Kōloa/Poi'pū-Līhu'e, and Wailua-Līhu'e) will include:

- Increasing service frequency on the mainline routes. TKB will strive to achieve 15 minute frequencies during peak commuting times and 30 minute frequencies during off-peak times for the two core mainline routes, the Kekaha-Līhu'e and Hanalei-Līhu'e routes by 2020.
- Extending service hours of operation later in the day and earlier in the morning, including on weekends.
- Streamlining mainline routes so that all bus stops served by mainline routes are re-located to the highway (with the exception of certain park'n ride lots) and buses no longer have to detour into commercial parking lots. Where appropriate TKB will also shorten or replace mainline routes with local circulators. Streamlining routes will reduce travel time, lower costs, simplify route structure, and allow for the use of larger buses.
- Gradually adding larger vehicles to the fleet, including standard 40' transit buses, to accommodate greater peak demand. While larger buses are more expensive to purchase initially, over time they will reduce cost per passenger on the busiest routes because they can support higher ridership per bus revenue hour.

Improve Local Circulators (Shuttles)

This will include increasing frequency, extending hours, and revising routes and schedules of existing local circulator routes (two of which operate within Līhu'e, one serves Kalāheo-Kōloa-Poi'pū, and another operates between Kapa'a and Kapahi) to provide more streamlined, easy to understand (from a user perspective) and cost efficient routes.



Initiate New Local Circulators (Shuttles)

The Kaua'i Bus should implement new circulators, or shuttles, within and in some cases between specific towns. During the mid term (by 2020), this will be a lower priority than improving the mainline commuter routes. The new circulator routes will be implemented based on

criteria applied in specific feasibility studies conducted as part of the Transit Planning element (see next page). The success of such local services will not be measured by their ridership alone. Shuttle functions include not only local circulation, but also collection and distribution of riders for mainline routes. In some cases, implementation of a circulator may allow simplifying and expediting a mainline route. Thus the value added from such local services may include improved efficiencies and increased ridership on mainline routes, in addition to the local circulation ridership. Based on projected population growth, public feedback, and stakeholder input, candidate circulator routes for feasibility studies will include:

- Kōloa-Poi'pū
- Kapa'a-Wailua-Wailua Homesteads
- Princeville-Hanalei-Hā'ena
- Additional Līhu'e area service



Fleet Conversion to Sustainable Power

The Kaua'i Bus fleet is made up almost entirely of vehicles with diesel engines. Diesel fuel derived from petroleum must be imported to Kaua'i as there are no oil wells in Hawai'i. This



means TKB is situated at the end of a long and tenuous supply chain, with potential for disruption of fuel supply and sudden increases in fuel cost. The average cost of diesel in Kaua'i in 2011 was \$4.78 per gallon, about 20% higher than the average price on the mainland U.S. TKB spent about 15% of its 2011-12 operations budget on fuel. According to the Energy Information Agency, diesel prices are expected to double by 2035 (moderate forecast – see Chapter 5), further limiting the County's ability to grow service. To ensure TKB can operate within available County resources, meet rapidly growing demand for transit service, and avoid potential supply disruptions, the bus fleet must be converted to a more sustainable engine and/or fuel type.

A preliminary analysis done in conjunction with this Plan analyzed eight potential alternative fuel options. (See Appendix G.) Based on potential costs, environmental impacts, fuel avail-

6A. TRANSIT PROGRAM

ability and general feasibility in Kauaʻi, the study concluded that a biodiesel blend (B20) is the most viable short term alternative fuel option for TKB. B20 is locally produced in Hawaiʻi, including by a small operation in Kauaʻi. By using a biodiesel blend TKB would reduce its reliance on imported petroleum fuel marginally, contribute to local businesses, and reduce greenhouse gas, particulate matter, and non-methane hydrocarbon emissions from bus operations. In addition, using B20 would not require any modifications of the existing bus fleet. The main hurdle involved in converting to B20 will be securing a reliable local supply that is cost effective. As a short term measure, TKB will gradually reduce its reliance on imported petroleum diesel by converting to B20 biodiesel or better.

The fuels study identified three primary long term fuel alternatives for TKB, including straight biodiesel (B100), battery electric vehicles, and hydrogen fuel cell vehicles. These alternatives were recommended primarily because all these fuel types have the potential to be produced in Hawaiʻi and the vehicles themselves produce very low (or no) emissions. There are hurdles involved in implementing each of these alternative fuel options across TKB fleet which are discussed in more detail in the full report available in Appendix G.

Because fuel prices are greatly affected by the economies of scale it will be most cost effective and feasible for TKB to transition to an alternative fuel as part of a larger statewide effort. The County Transportation Agency will work with the Kauaʻi County administration, the State of Hawaiʻi and the Neighbor Island County transit agencies to identify a viable, sustainable, affordable, locally produced alternative fuel that can be used statewide. A multi-county, multi-agency cooperative will be the most cost effective way – and may be the only practical way – for TKB to transition to a long term alternative fuel source for its bus fleet. Additionally, TKB should be able to use federal funding to establish an alternative fuels pilot program. Several federal agencies have incentive programs that TKB can leverage to move into an alternative fuels transition process.

Bus Maintenance and Storage Facilities

The Kauaʻi Bus currently relies on a single, central maintenance and bus storage facility in Lihue. This increases deadhead miles (out-of-service trips made to route origination points) for routes from the West Side and North Shore. At the same time, the Lihue bus maintenance facility and parking lot are at capacity. As the transit system grows, the lack of residual capac-

ity at the current facility will become a significant problem. Also, over time, it is likely TKB will make increasing use of longer vehicles, including eventually some 40-foot urban buses. The maintenance bays at the current Lihue facility are not long enough to accommodate such vehicles. Kauaʻi County will work to identify two remote bus storage facility locations, one on the West Side and one on the North Shore for routes that originate there in the morning and terminate there in the evening. These would be fenced, lighted, secure facilities with capability to wash and clean vehicles. These would not require vehicle maintenance capabilities beyond washing and cleaning. Distributing some vehicles to the remote storage facilities will then allow TKB to support a larger fleet of buses and will allow TKB to retrofit the existing (Lihue) bus headquarters maintenance and storage area to accommodate larger buses and support alternative fuels. Operational issues and opportunities will be further evaluated to determine feasibility of this concept.

Park'n Rides

It is clear from the survey research conducted for this plan that there will be a continuing market for park 'n ride access (as well as passenger drop-off) to support the mainline commuter routes. In some parts of the island, it will not be feasible to offer local transit services to collect and distribute passengers, and many of the island's neighborhoods are neither walkable nor suitable for bicycling. While conditions for walking and bicycling will improve over time, TKB will grow ridership in the interim by adding and improving and in some cases implementing new park 'n ride facilities.



Transit Planning

The County will undertake short range (1 – 3 years) transit service and operations planning and mid-range (4 – 7 years) strategic planning for the County transit system. This may be accomplished through staff or through external consulting contracts. (This long range multimodal land transportation plan will serve as the long range component for years 8 – 20.)

6A. TRANSIT PROGRAM

Routine Bus Maintenance

The Kauaʻi Bus maintains its buses according to routine maintenance criteria and protocols provided by the bus manufacturers. The agency also repairs its vehicles as required and washes and cleans them regularly. These good practices will be continued over time in the face of budget pressures and other challenges. As the system grows and the number of vehicles increases, the county anticipates associated increases in the cost of the TKB routine bus maintenance program.

Routine Facility Maintenance

The County will strive to maintain all of its capital assets in a continuing state of good repair. Priorities will include bus stops, park 'n ride lots and remote bus storage facilities as well as other capital assets. The cost of such maintenance activities will be anticipated and budgeted.

Operations and Management

In addition to the program elements described above, the cost of providing transit services on Kauaʻi includes the cost of administration and operations of TKB. Although there will be increasing efficiencies of scale as the agency's services expand and grow, management should anticipate and budget for some growth in the organization itself, to ensure adequate attention is given to planning, operations, customer relations, marketing, accounting and other essential functions.

Other Actions

The Kauaʻi Bus will investigate the feasibility of providing racks for surfboards on the sides of its buses, an idea that came up often in public comment. Also, in the future, as buses are replaced, TKB will evaluate whether a different bike rack that can accommodate three or four bikes at one time – another common public request – would be feasible, given operating conditions.



Table 6-1: Summary of transit program elements

Program Element	Capital	Federal Eligible	Priority			Goals Supported *
			Short Range	Mid Range	Long Range	
Transit Planning	-	✓	✓	✓	✓	1, 3, 4, 5, 6, 7, 8
Transit Marketing and Information	-	✓	✓	✓	-	1, 3, 8
Operative Revenue Improvements	-	✓	✓	-	-	1, 3
Digital Services	✓	✓	✓	-	-	1, 3
Improve Local Circulators	✓	✓	-	✓	✓	1, 3, 4, 5, 6, 8
Initiate New Local Circulators	✓	✓	-	✓	✓	1, 3, 4, 5, 6, 8
Improve Commuter Routes	✓	✓	✓	✓	✓	1, 3, 4, 5, 6, 8
Sustainable Power - Fleet Conversion	✓	✓	✓	✓	✓	1, 3, 4, 5, 6, 7, 8
Park 'n Ride Facilities	✓	✓	-	✓	✓	1, 3, 4, 5, 6, 8
Bus Stops	✓	✓	✓	✓	-	1, 3, 4, 5, 6, 8
Bus Maintenance and Storage Facilities	✓	✓	✓	✓	-	7
Routine Bus Maintenance	✓	✓	✓	✓	✓	7
Routine Facility Maintenance	✓	✓	✓	✓	✓	7
Operations and Management	-	-	✓	✓	✓	1, 3, 4, 5, 6, 7, 8
Other Actions	✓	✓	✓	✓	✓	1, 3, 4, 5, 6, 8

*See plan goals from Chapter 2

Priorities for Immediate Implementation (1-3 years):

Bus Stops

- ➔ Install shelters at bus stops with the highest priority as funding permits
- ➔ Work with Hawai'i DOT to complete a conceptual design study for the top 25 busiest stop locations; design will include:
 - Pedestrian access facilities and safety provisions
 - Pedestrian crosswalk design
 - ADA compliant waiting areas
 - Shelter location and design
 - Drainage and storm water runoff

Operating Revenue

- ➔ Gradually increase monthly pass rates to be more in line with single-ride fares
- ➔ Develop and implement a discounted, bulk-rate, commuter pass program that will allow employers to provide paid passes for their employees
- ➔ Work with Kaua'i Community College to reach agreement on extension of the commuter pass to students
- ➔ Coordinate with Hawai'i DOT and the Neighbor Island County transit agencies to develop a plan for modernizing transit fare collection to smart cards and transition away from cash fares

Digital Services

- ➔ Establish a GPS-based route and schedule information system (trip planner) using Google maps or a similar program
- ➔ Begin installation of GPS tracking devices on TKB buses

Marketing and Information

- ➔ Increase information and amenities available online, including route maps, real-time bus tracking, updates/news, pass sales, commuter tool kits and feedback
- ➔ Initiate a marketing program aimed at attracting more visitors and tourists to use TKB

Improve Commuter Service

- ➔ Continue the process of improving service levels to meet demand including:
 - Improving frequencies
 - Expanding weekday hours of service, and providing more week-end service
 - Streamlining mainline routes

Fleet Conversion to Sustainable Power

- ➔ Work with the County administration, the State of Hawai'i and Neighbor Island County transit agencies to identify a long term fuel alternative that would work statewide
- ➔ Identify a local supplier of B20 biodiesel - to be used in the interim while a long term alternative fuel solution is determined

Bus Maintenance and Storage Facilities

- ➔ Identify suitable locations on the North Shore and West Side for the County to use for satellite bus storage/washer facilities
- ➔ Compete for capital grants to make improvements to bus maintenance and storage facilities
- ➔ Develop a plan to retrofit the existing (Lihu'e) bus facility to extend the length of one or more maintenance bays to accommodate 40' urban buses and to support alternative fuels

6A. TRANSIT PROGRAM

PRIORITIES FOR MID-RANGE IMPLEMENTATION (2016-2020):

Bus Stops

- Install shelters at highest priority bus stops based on boardings
- Using conceptual design by TKB and Hawai'i DOT, implement upgrades to the 25 busiest stop locations
- Work with Hawai'i DOT to create conceptual designs for the remaining bus stops

Digital Services

- Develop a map-based software that the public can use through the Internet to track real-time bus arrival times
- Install of Wi-Fi service on buses and at selected stops

Marketing and Information

- Further expand marketing program geared toward visitors

Improve Commuter Service

- Continue to increase service to meet demand, achieving a doubling of service frequency on mainline commuter routes
- Gradually relocate bus stops out of shopping centers, parking lots and side streets to the main highway (with the exception of certain park 'n ride lots)
- Begin purchasing larger vehicles for the core mainline routes, including 40' urban buses

Improve Local Circulators

- Continue performance evaluation of existing routes for improvement
- Improve schedule and route structure of existing routes to enable more streamlined, easy to understand and operationally cost efficient routes
- Increase frequency of local circulators as demand increases and in conjunction with increases to mainline (connecting) route frequency

Initiate New Local Circulators

- Develop criteria for implementation and prioritization of new local circulators
- Implement at least one new circulator such as Kōloa-Poi'pū, North Shore, or Wailua Homesteads
- If appropriate seek private sector cost participation

Fleet Conversion to Sustainable Power

- Significantly reduce the consumption of diesel per revenue bus hour
- Continue conversion of the bus fleet to the selected long range alternative fuel/engine type

Bus Maintenance and Storage Facilities

- Establish satellite bus facilities in the North Shore and West Side for overnight and mid-day bus storage
- Retrofit the existing (Lihue) bus facility to accommodate larger buses and support alternative fuels

Park'n Rides

- Add to and improve park'n ride facilities
- Evaluate the need for new park'n ride facilities

Transit Planning

- Complete short range (1-3 years) transit service and operations planning every three years
- Update mid-range (4-7 years) strategic plans every five years

Routine Bus Maintenance

- Continue to keep bus fleet in a state of good repair

Routine Facility Maintenance

- Continue to keep facilities owned by TKB in a state of good repair

Operations and Management

- Budget for some administrative growth in the organization itself

Other Actions

- Investigate the feasibility of providing racks for surfboards on the sides of its buses
- Evaluate feasibility of using a different bike rack that can accommodate three or four bikes at one time

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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 6B BICYCLE PROGRAM



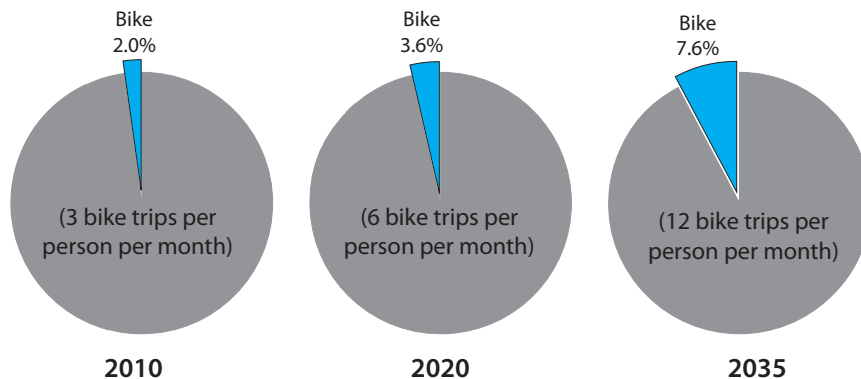
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BICYCLE PROGRAM SUMMARY

In 2010, about 2% of all trips in Kaua'i were made by bicycle. This relatively low statistic reflects a lack of safe places to bicycle throughout most of the island. However, demand for bicycling in Kaua'i is actually quite high. This was evident during the public workshops where there was consistent and strong support for safer bicycle infrastructure. Demand for bicycling is also apparent from the high use of the recently completed sections of the East Side multiuse trail, one of the few robust bicycle facilities in Kaua'i. The physical characteristics of Kaua'i, including the short distances between most towns, the dense street networks in towns, the world class scenery, and the year-round warm weather, also position Kaua'i well to become more of a bicycling community. To take advantage of the high demand, and other existing strengths in Kaua'i, a regular investment in bicycle planning infrastructure improvements is needed over the next 25 years.

Implementation of this program will help the County better meet existing demand and achieve many of the County's transportation goals (see Chapter 2). These include increasing affordable transportation options, improving public health, reducing energy consumption, reducing traffic growth, and making Kaua'i a more enjoyable place to live, work and recreate. As part of reaching these goals, the County has set a 2035 policy target for bicycle mode share (the percent of daily trips made by bicycle) at 8% of all person trips, up from 2% of trips in 2010 (see Figure 6-3).

Figure 6-3: Policy targets for bicycle mode share by 2020 and 2035 in Kaua'i



Bicycle Program Components

Bicycle Planning

- Develop a long range island-wide bicycle network plan by the end of 2015
- Identify important primary and secondary bicycle corridors
- Program one or two significant projects a year through 2035

Town Connector Trails

- Connect town pairs/groups:
 - Kekaha-Waimea
 - Kōloa-Poi'pū
 - Puhi-Lihue-Hanamā'ulu
 - Wailua-Kapa'a
 - Kilauea-Princeville-Hanalei
- Use separated paths where feasible
- Prioritize projects based on demand

Rural Bicycle Lanes

- Provide continuous lanes across bridges and through intersections
- Serve longer trips
- Connect regional destinations

Town and Village Bicycle Lanes

- Give priority to "Safe Routes to School" and transit corridors
- Connect local destinations
- Provide access to separated paths
- Give low priority to low-speed, low-volume local streets

Multiuse Coastal Trails

- Continue to develop this significant recreational resource
- Support longer distance commuting to job centers
- Give visitors an alternative to driving

Other Multiuse Trails

- Connect recreational and outdoor destinations to housing and lodging areas
- Provide additional recreational resource
- Support longer distance commuting
- Give visitors an alternative to driving

Bicycle Parking

- Address bicycle parking needs at activity centers
- Require bicycle parking to be provided at new developments at a rate of 8% of auto parking spaces



6B. BICYCLE PROGRAM

BACKGROUND

The lack of safe, well-connected bicycle facilities in Kaua'i has limited bicycling to about 2% of daily person trips. What infrastructure does exist is found primarily in the East Side and Lihue districts. This includes a 1.2 mile bicycle lane in Lihue, a 3 mile off-street paved shared-use path adjacent to Kawaihau road in Kapahi, a 2.5 mile network of paved multiuse paths in Lydgate park, and a 4.1 mile long multiuse path along the coast adjacent to Kapa'a. The latter two trails are sections of the partially-completed East Side Trail, also known as Ke Ala Hele Makalae. When completed this will be a 16 mile long multiuse paved trail connecting Anahola to Nāwiliwili mostly along the scenic eastern coastline of Kaua'i. However, funding and a timeline for completing the entire trail has not been finalized.

In addition to these facilities, the Hawai'i DOT and County Public Works Department have designated some streets and highways as signed on-street bicycle routes, mostly in and around Lihue. However, many of these routes are on high-traffic, high-speed roads that typically have little more than wide shoulders, which can disappear on bridges, at intersections and in other narrow spots on the highway leaving bicyclists in a hazardous situation. The Hawai'i DOT completed a State Bicycle Plan in 2003, which includes proposals for a robust network of bicycle lanes, bicycle paths, and signed routes on highways. Additionally, as an early success of this multimodal transportation plan, and as a result of strong advocacy on the part of the County Public Works Department and Kaua'i Path, the State DOT now plans to add bicycle lanes to the section of the Kaumuali'i Highway being widened in Puhi in 2012.

A key player in bicycle trail development in Kaua'i has been Kaua'i Path, a grassroots community organization with a mission of advocating for, conducting studies for, and implementing projects to create a network of island-wide non-motorized multi-use paths. Kaua'i Path was instrumental in starting the East Side Trail project, and recently produced The North Shore Path Alternatives Analysis aimed at establishing a continuous bicycle/pedestrian route between

Kilauea and Hanalei. In conjunction with Kaua'i Path, West Side residents also formed their own grassroots organization, West Side Path, and in early 2012 produced a West Side Path Alternatives Report that analyzed options for a trail between Kekaha and Waimea. Coordinating with these community organizations will be critical to planning and implementing future bicycle projects in Kaua'i.

Developing not just bicycle infrastructure, but a bicycle network, that includes a system of safe, well-connected, continuous routes for bicyclists is a critical part of bicycle planning. Kaua'i is in the early stages of bicycle network development. Given the short distances between towns, the reasonably compact development patterns within many towns, the world class scenery present throughout the island, the year-round warm weather, and strong community support for expanding bicycling options, there is high potential in Kaua'i to develop a robust network of bicycle trails, lanes and neighborhood routes. The bicycle network will provide improved access to transit for many households. At the same time, development of Kaua'i's transit system (see Section 6A) will greatly expand the feasible range of many bicycle trips. Additionally, creating safer places for children to bicycle in Kaua'i's neighborhoods and towns was repeatedly stressed by the public as one of the most important goals for this plan.

The sections of the East Side Trail that have been completed have proven to be immensely popular among both residents and tourists, illustrating the high demand for bicycling that exists in Kaua'i. Other communities around Kaua'i are equally ready for better bicycling options, which will be necessary to increase the bicycle mode share from 2% in 2010 the County's policy target of 8% by 2035. Additionally, improving bicycle infrastructure is a critical aspect of achieving the goals of this plan, including increasing affordable transportation options, improving public health, reducing energy consumption, reducing traffic growth, and making Kaua'i a more enjoyable place to live, work and recreate. This program describes the steps the County will need to take over the next 25 years to make bicycling safer, a more viable means of transportation, and a more viable recreation option in Kaua'i.



6B. BICYCLE PROGRAM

GENERAL PROGRAM BY 2035:

Overview

The bicycle program target of an 8% mode share by 2035 addresses trips made both by residents and by visitors. This approach recognizes several key facts about the nature of bicycle facility networks. First, almost any investment made in bicycle facilities in Kaua'i will benefit both residents and visitors. Even the coastal trails described in the following pages offer this dual benefit, providing a recreational resource for people who live nearby and for vacationers staying in island lodging. Some coastal trails will also play a role in commuting and other utilitarian trip types.

Second, bicycle systems require a connected network of facilities, but those facilities can take on a variety of types: separated pathways or trails, on-street lanes, and mixed-use routes where bicycles and motor vehicles share low-speed roadways. Of these, the separated trails offer the greatest benefit for recreational users (residents and visitors) and the greatest safety. However, on-street bicycle lanes are used throughout the United States to serve safe, local utilitarian travel and to extend the range and increase the options for recreational trips. In the sections below, a facility typology is used to focus the development of a bicycle capital planning program, but the intent is to use all of the various facility types to make the appropriate connections as needed, given the location-specific landscape and environment.



Third, the bicycle program is seen as tightly integrated with the county streets program (and with the state road program) so that the two are complementary and coordinated. Managing traffic speeds and modernizing design of county streets in particular will have major benefits for bicyclists, especially children and other family members making local trips. At the same time, having increased bicycling on county streets will reduce the heavy load of unnecessary, short auto trips that currently clog many town streets in Kaua'i.

Finally, the development of a viable bicycle network in Kaua'i will bring economic benefits in three ways:

- Through diversification of the travel and tourism industry;
- Through a reduction in the current auto dependency of on-island travel; and
- Through the associated reduction in the environmental impacts of tourism.

The national and international visitor market is increasingly interested in active transportation and increasingly impatient with destination environments that require endless "commuting" by car. An island-wide network of great bicycle facilities will help Kaua'i compete internationally for low-impact tourism that infuses money into Kaua'i's economy but also reduces per capita daily visitor auto travel.

Table 6-2: Summary of bicycle program elements

Program Element	Capital	Federal Eligible	Priority			Goals Supported *
			Short Range	Mid Range	Long Range	
Bicycle Planning	-	-	✓	✓	✓	1, 3, 4, 5, 6, 8
Town Pair Trail Connections	-	✓	✓	✓	✓	1, 3, 4, 5, 6, 8
Rural Bicycle Lanes	-	✓	-	✓	✓	1, 3, 4, 5, 6, 8
Town and Village Bicycle Lanes	✓	✓	✓	✓	✓	1, 3, 4, 5, 6, 8
Multi-Use Coastal Trails	✓	✓	✓	✓	✓	1, 3, 4, 5, 6, 8
Other Multi-Use Trails	✓	✓	-	✓	✓	1, 3, 4, 5, 6, 8
Bicycle Parking	✓	-	✓	✓	✓	1, 3, 4, 5, 6, 8

*See plan goals from Chapter 2

6B. BICYCLE PROGRAM

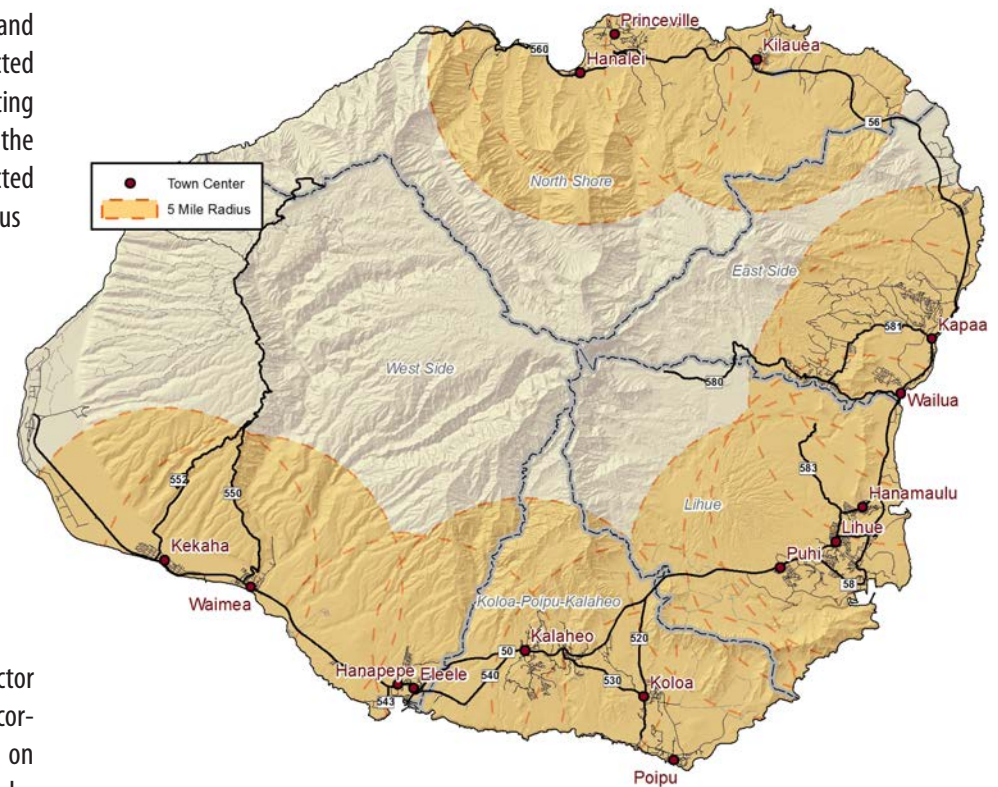
Bicycle Planning

Kaua'i County will develop a long range island-wide network plan by the end of 2015. This network plan will use the Hawai'i DOT bicycle plan (*Bike Plan Hawai'i*) as a starting point and will address all types of facilities (routes, lanes, trails, etc.) within a comprehensive, connected framework. The network plan will identify primary corridors for longer-distance commuting and secondary corridors for local circulation. The County's target policy calls for tripling the percentage of daily trips made by bicycle on Kaua'i, an outcome that will require a connected network that enables seamless, convenient, safe bicycle travel within a five-mile radius around the core areas of larger towns and villages. Because most of the larger towns in Kaua'i are so closely spaced, this will include most of the settled areas of the island (see Figure 6-4 at right). Once the island-wide bicycle network plan has been completed, the County will use it to identify priority projects and thereafter will program **at least one or two significant projects each year through 2035**. Implementation of bicycle planning and design will be coordinated by a new multimodal planner position that will be assigned to work as part of both the Planning and Public Works Departments.

Town Connector Trails

Alternative analyses were completed for the North Shore and West Side town connector trails in early 2012. The County will continue this ongoing work by preparing general corridor concepts for connecting the island's closely-spaced town pairs and groups. Based on public comments, these will include Kekaha-Waimea, Kōloa-Po'ipū, Lihue-Puhi-Hanamā'ulu, Wailua-Kapa'a, and Kilauea-Princeville-Hanalei. Town pair trail connections should generally be designed as separated pathways, although they could run along or with public road rights of way. However, in some cases the best solutions may be on-street lanes (see next page). The objective of this work will be corridor concept plans (general route, major structures, and right of way issues) that are sufficiently well-defined to support program-level cost estimates. This information will enable the County to begin setting priorities for capital programming and implementation as part of the island-wide bicycle network plan. Prioritization will take into account both the estimated demand for each corridor as well as feasibility. The potential for these facilities to provide connections to key bus stops in The Kaua'i Bus route system will also be a criterion used to prioritize projects.

Figure 6-4: A well connected bicycle network will be planned within a 5-mile radius around the center of each of the largest towns in Kaua'i.



6B. BICYCLE PROGRAM



Wide shoulder on rural highway near Poi'pū

Rural Bicycle Lanes

Kaua'i has virtually no on-street bicycle lanes today and none are on rural roads. The "bicycle routes" signed on some sections of state highway are not bicycle facilities; they are paved shoulders provided for motor vehicle safety purposes. Actual bicycle lanes are designed with widths that meet national standards, with provision for safe crossings of streams, and – most importantly – with continuous lanes that manage lane transitions through intersections. Rural bicycle lanes on county and state highways would serve longer trips needed for commuting by bicycle to be practical. Rural lanes would support bicycling to key destinations such as the Kaua'i Community College campus, high school campuses, various local and regional shopping centers, and the civic center and county government district in Līhu'e. Rural bicycle lanes would also support bicycle-oriented tourism in the Kōloa-Poi'pū area and along the North Shore from Kīlauea to Hā'ena. The potential for specific bicycle lanes to provide connections to key bus stops in The Kaua'i Bus route system will also be a criteria used to prioritize projects.

Town and Village Bicycle Lanes

Bicycle lanes on county roads and state highways through the larger towns and villages would serve the essential function of providing safe bicycle connections for short trips, which are expected to be the majority of bicycle trips on Kaua'i (as is the case throughout mainland counties). These facilities will enable children to bicycle to school and would support active living in Kaua'i's neighborhoods. They also will provide access to and from the town pair trail connections, rural bicycle lanes (see previous two program components), and transit stops. Connecting bicycle lanes to transit stops will bridge "the last mile" of transit trips for many potential transit riders in Kaua'i, making longer trips between towns feasible by a combination of bicycle and transit. In general, bicycle lanes will be prioritized for local streets where posted speeds exceed 30mph and traffic is over 5,000 vehicles per day. Other more local, low-speed streets generally can accommodate safe bicycle travel within a mixed traffic setting. Special attention will be given to "safe routes to school" and access to local bus stops in planning and prioritizing local bicycle lanes.



Bicycle lane on Ka'ana Street in Līhu'e

6B. BICYCLE PROGRAM

Multiuse Coastal Trails

East Kaua'i's Coastal Shared Use Path will be regarded as a prototype for additional coastal trails on Kaua'i, including in the Poi'pū area and in other parts of the island. Coastal trails have the potential to serve multiple critically-important functions, including providing routes for commuting and for long distance recreational rides and opportunities for increased physical activity. Such facilities also would offer significant appeal to tourists interested in active vacations, thereby providing an alternative to car-based touring and sight-seeing. Priority will be given to completion of the East Side facility from Lihu'e to Anahola. However, the County will begin identification of future projects as part of the island-wide bicycle network plan (see page 6-16), using the experience gained on the East Side trail to frame and define future projects. Depending on the final alternative selected for the North Shore and West Side paths, coastal sections could be included in the development of those trails that would serve to meet multiple bicycling needs.



Multiuse coastal trail near Kapa'a on the East Side of Kaua'i



Other Multiuse Trails

Hawai'i is unique among the United States in that it possesses some of the nation's most beautiful scenery, coupled with a climate well-suited for outdoor recreation – yet has few recreational trails. This problem is evident on Kaua'i, where opportunities for hiking and bicycling away from motor vehicle traffic are quite limited. Kaua'i County will work with its partners in the state and federal government to identify and develop multiuse trails connecting recreational destinations and areas suitable for outdoor recreation. There also are potential corridors within towns and villages that could provide access to local schools and parks.

Bicycle Parking

The County will address bicycle parking needs in key activity centers. Bicycle parking needs will be met through a combination of private sector actions (on private property) and public sector improvements in downtowns and commercial areas. To help meet the bicycle program target of an 8% bicycle mode share in Kaua'i by 2035, the County will update the zoning code to require bicycle parking be provided for new developments at a rate of 8% of auto spaces. This will help the County meet demand for bicycle parking on private property.

Priorities for Immediate Implementation (1-3 years):

Bicycle Planning

- Implementation of bicycle planning and design will be coordinated by a new multimodal planner position that will be assigned to work as part of both the Planning and Public Works Departments
- Develop a long range island-wide bicycle network plan by the end of 2015
- Prioritize the list of desired projects from the bicycle plan for implementation

Town Connector Trails

- Develop corridor concept plans (general route, major structures, and right of way issues) that are sufficiently well-defined to support program-level cost estimates
- Identify priorities for town connector routes taking into account demand, feasibility, and connections to key bus stops along The Kaua'i Bus routes
- Begin capital programming and implementation of town connector trails identified as the highest priority as part of the island-wide bicycle network plan

Town and Village Bicycle Lanes

- Implement bicycle lanes in the Lihu'e core area based on recommendations in the Lihu'e Core Area Plan
- Implement bicycle lanes in towns and villages outlined in approved development plans

Multi-Use Coastal Trails

- Continue East Side Trail development
- Identify future coastal trails for development

Other Multi-Use Trails

- Kaua'i County should work with its partners in the state and federal government to identify multi-use trails connecting recreational destinations

Bicycle Parking

- Update the zoning code to require developers to provide bicycle parking at a rate of 8% of the auto parking requirement

PRIORITIES FOR MID-RANGE IMPLEMENTATION (2016-2020):

Bicycle Planning

- Implement the highest priority projects that emerge from the bicycle plan, including 6-12 significant projects by 2020
- The bicycle plan will be updated at least every five years

Town Connector Trails

- Implement the three highest priority town connector trails by 2020

Rural Bicycle Lanes

- All new and reconstructed rural highways will be built to safely accommodate bicyclists in a designated lane including through intersections and across bridges
- Rural bicycle lanes will be installed on highways in the highest priority corridors as identified in the bicycle plan, with special attention given to corridors that connect key destinations such as schools, regional shopping centers, civic centers, and bus stops

Town and Village Bicycle Lanes

- Implement in-town bicycle lanes on the highest priority corridors identified in the bicycle plan and based on future town core area plans
- All major streets in Kaua'i, with higher traffic volumes, higher speeds, and that connect to a school will have bicycle lanes
- Special attention will also be given to corridors that connect town cores with multi-use paths

Multi-Use Coastal Trails

- Complete the East Side Trail
- Begin development of at least two other coastal trails as part of implementing the island-wide bicycle plan

Other Multi-Use Trails

- Implement at least two new recreational-use trails (could overlap with other trails)

Bicycle Parking

- Implement new bicycle parking in key public activity areas in conjunction with trail and bicycle lane build out

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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 6C PEDESTRIAN PROGRAM



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6C. PEDESTRIAN PROGRAM

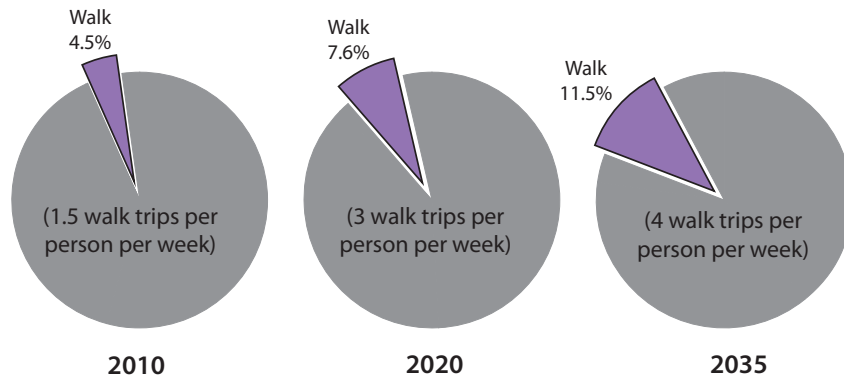
PEDESTRIAN PROGRAM SUMMARY

Several of the County's Transportation Goals (see Chapter 2) will require increases in the feasibility, comfort and safety of pedestrian travel for short trips. Progress toward this goal is most readily monitored by tracking the "pedestrian mode share" (percent of daily person trips made by walking) in Kaua'i. The County has set a 2035 policy target for pedestrian mode share at 12% of all person trips, up from 5% of trips in 2010 (see Figure 6-5). To encourage more pedestrian trips, this plan describes short and long term pedestrian program components (shown at right). Each of these components addresses planning and infrastructure improvements that would alleviate the primary deterrents to walking expressed by the public, including the lack of safety, connectivity and attractiveness of the pedestrian infrastructure in Kaua'i. Much of Kaua'i is not walkable today and it will not be possible to rectify that problem quickly everywhere. Therefore the pedestrian program focuses on making improvements to the most crucial pedestrian places in Kaua'i, including the town



core areas where densities are higher, along corridors connecting schools and parks that are frequently used by children, and on streets that provide access to bus stops.

Figure 6-5: Policy targets for pedestrian mode share by 2020 and 2035 in Kaua'i



Pedestrian Program Components

Pedestrian Planning

- Establish a routine, ongoing pedestrian planning program
- Prioritize small pedestrian needs throughout Kaua'i
- Ensure pedestrian capital planning is a part of all future developments

Safe Routes to School (SRTS)

- Identify all safety and access needs near each school by 2015
- Make all needed sidewalk and crosswalk improvements at each school by 2020
- Continue to promote walking to school

Future Town Core Planning

- Develop town core plans for larger towns in Kaua'i
- Incorporate schools, small parks, plazas and mixed-use zoning in plans

Town Core Implementation

- Fully implement all pedestrian provisions of the Lihue Town Core Plan by 2020
- Implement pedestrian provisions of future town core plans
- Develop a form-based code to guide the design of developments

Access to Transit

- Identify sidewalks and crosswalks needed for safe access to transit
- Implement pedestrian access needs as bus stops are upgraded (see transit program)

Social Trail/Path Identification

- Map and prioritize existing walk routes as part of the district development plans
- Protect high priority routes in development review
- Purchase and improve high priority routes

Pedestrian Safety Improvements

- Identify safety needs based on accident reports
- Address safety needs with annual spot improvements



6C. PEDESTRIAN PROGRAM

BACKGROUND

Prior to the 1970s Kaua'i was largely a plantation community with a resident population under 30,000 and with only about a third of the annual visitors that arrived in 2010. Because of Kaua'i's rural character, many of the streets and highways did not include sidewalks. However, because of the relatively low traffic volumes on most streets, in many ways it was easier and safer to walk along the shoulders or even the center of streets than it is today.

From 1970 to 2010 Kaua'i's population more than doubled and automobile use increased even more rapidly. Traffic growth has been exacerbated in part by the fact that most new developments were designed primarily for automobile circulation and access. During this period, the availability of safe pedestrian infrastructure has not adequately kept up with population and pedestrian demand. As a result, the walk environment in the town cores and residential neighborhoods is often fragmented, narrow, obstructed, exposed to traffic, circuitous, or simply non-existent. Predictably then, many residents and visitors opt to drive instead of walk, even for very short distances.



The lack of safe places to walk was a consistent theme expressed by citizens at each of the public workshops. Parents emphasized that they often did not allow their children to walk or bike even in areas near their homes because there was no safe place to do so. Many potential transit users (who must also be pedestrians at some point during their journey) said they don't use the bus in Kaua'i because there is no safe place to walk at one or both ends of their transit trip. Some people said they would drive to a different neighborhood or town in Kaua'i, where better pedestrian facilities exist, just to go for a walk. Additionally, walking as a means of mobility is frequently not a choice, but a necessity for those of Kaua'i's most vulnerable residents who cannot drive. This includes low income households, the disabled, children and the elderly; the latter of which is the fastest growing age group in Kaua'i.



Planning for a safe, inviting, and well-connected pedestrian network throughout Kaua'i's towns and residential neighborhoods is a critical component of this plan and necessary to achieve the County's policy target of increasing walk trips from 5% of all trips today to 12% of all trips by 2035. Pedestrian planning will also be critical to:

- Increasing pedestrian safety;
- Increasing physical activity levels; and
- Improving access for all residents and visitors to shops, businesses and transit.

It's clear from public comments that the demand for walking in Kaua'i is high. This is also true of the tourism market where there is significant appeal to visitors in being able to walk safely to shops and restaurants within town. The pedestrian program described here outlines the actions the County will take to over the next 25 years to better meet existing demand and increase the opportunities for shorter trips to be made by walking. Improving pedestrian conditions will also be an important part of increasing transit mode share by providing access to bus stops.

6C. PEDESTRIAN PROGRAM

GENERAL PROGRAM BY 2035:

Pedestrian Planning

The County's policy target calls for a near tripling of the walk mode share in Kaua'i by 2035. This will require overcoming the fact that pedestrian infrastructure on Kaua'i is clearly lacking. While sidewalks and crosswalks exist in many parts of the towns in Kaua'i, they are often narrow and exposed to traffic, disconnected, or end suddenly. This cannot be solved everywhere on the island for many years, due to limitations of funding and the sheer size of the problem, so it will be important to:

- Prevent development of any new neighborhoods or commercial districts that do not have adequate provision for pedestrians; and,
- Set priorities for the long process of redressing the lack of pedestrian accommodation in areas that have already been built.

In order to address these needs, the County will establish a routine, ongoing pedestrian planning program. The primary purpose of this program will be to identify and prioritize the many small pedestrian infrastructure improvement projects needed across the island. Additionally, the pedestrian planning program will set the stage for ensuring that pedestrian needs and capital planning are specifically addressed in future area development plans. As part of the planning process the County will require that all future development plans provide safe and convenient pedestrian infrastructure that is well connected both internally within new developments as well as to surrounding streets, neighborhoods, and bus stops. Finally, future county road projects in Kaua'i will prioritize pedestrian use and safety.



Safe Routes to School

The Safe Routes to School (SRTS) program is aimed at enabling more students to walk and bike to school. This is a national program that has been adopted by many cities and counties across the country, including Kaua'i County in May, 2011. In July, 2012 Governor Abercrombie signed into law HB 2626, also known as Safe Routes to School Bill, which will provide funding for county SRTS improvements. The two primary components of the SRTS program are community outreach and capital improvements. Get Fit Kaua'i has been instrumental in bringing primarily the community outreach component of SRTS to a number of schools in Kaua'i. This includes coordinating walks, identifying and publicizing safe routes, spreading awareness, and providing incentives for parents and students to walk or bicycle. However, parents are unlikely to encourage their kids to walk to school on a regular basis if safe pedestrian facilities around the schools are lacking. In order to strengthen this component of the SRTS program, the County will identify pedestrian access needs around all elementary, middle and high schools on Kaua'i by 2015 and will implement the necessary capital improvements by 2020. This includes making sidewalk and crosswalk improvements around each school as well as on the primary pedestrian corridors approaching each school. There was strong public support during the public workshops regarding the need to make it safer for keiki to walk and bike to school. Placing emphasis on the continuing SRTS program will help address this need and help the County meet several goals, including increasing physical activity among youth, reducing traffic congestion around schools, reducing GHG emissions and reducing dependence on petroleum imports.



6C. PEDESTRIAN PROGRAM

Future Town Core Planning

Kaua'i County will develop additional town core plans in the larger towns across the island that identify primary pedestrian corridors and intersections needing improvement. These town core plans will be modeled on the recently-completed Lihue Town Core Plan. Places such as Kekaha, Waimea, Hanapēpē-'Ele'ele, Kalāheo, Kōloa, Puhi, Lihue, Kapa'a, Kilauea and Hanalei already have mixed-use town cores with dense, gridded street networks, providing a great framework for pedestrian circulation. However, these towns lack safe sidewalks and crosswalks on many streets and lack adequate pedestrian connections to the surrounding residential neighborhoods and hotels. Improving pedestrian facilities will enhance the vibrancy of these and Kaua'i's other towns, slow traffic growth, improve safety and attract additional businesses, residents and tourists. Town core plans will also focus on creating and strengthening mixed-use areas. The plans will incorporate pedestrian-oriented urban design features on the main streets where appropriate, such as street trees, pedestrian scale lighting, signs, storefront windows, and traffic calming devices.



Drawing from the Lihue Town Core Plan, 2010

Town Core Plan Implementation

The Lihue Town Core Plan was adopted by Kaua'i County Council in 2010. At the heart of this plan are recommendations for improving the pedestrian environment and pedestrian connections in Kaua'i's primary commercial and business center. Kaua'i County will fully implement the pedestrian provisions in this plan by 2020. This will increase the pedestrian mode share in Lihue and make the streets and public spaces in Lihue more vibrant, active places. Additionally, implementing this plan will generate economic investment from private companies, small businesses, residents and tourists. The County Planning Department will develop a form-based code for use in guiding the design of development, redevelopment and infill projects within town core areas.

Access to Transit

Pedestrian and transit trips are closely linked. Transit provides a means for pedestrians to make longer trips between towns, while accessing transit is difficult without adequate pedestrian infrastructure. A common theme expressed by residents of Kaua'i at the public workshops was the inability to safely walk to and from bus stops. If the County is to meet its policy target of significant increases in transit ridership and pedestrian trips through 2035, it must identify, prioritize and make the pedestrian infrastructure improvements necessary so that all bus stops on Kaua'i can safely be accessed by pedestrians. Ensuring there is safe and convenient pedestrian circulation around bus stops will be prioritized by the Public Works Departments.



6C. PEDESTRIAN PROGRAM

Social Trail/Path Identification

During the planning process, the public described and noted the importance of the many informal “social trails” that people regularly use to walk across undeveloped land throughout the island. Some of these routes may be critical to achieving a connected pedestrian network. The County will map and prioritize existing walk routes and social trails as part of district development plans. Those deemed high priority routes will be protected during development review and may need to be purchased and/or improved by the County.



Example of a pedestrian infrastructure that would benefit from improvements



Example of a social trail near Kapa'a

Pedestrian Safety Improvements

Improved pedestrian safety is a significant benefit in its own right. It is also a prerequisite for increased levels of walking. The County will actively monitor annual “pedestrian-involved” accident data on Kauaʻi. The data will be used to identify hazardous streets and intersections for pedestrians, and determine the improvements needed to make those locations safer. Priority pedestrian spot improvements will be programmed, funded and completed.

Table 6-3: Summary of pedestrian program elements

Program Element	Capital	Federal Eligible	Priority			Goals Supported *
			Short Range	Mid Range	Long Range	
Pedestrian Planning	-	-	✓	✓	✓	1, 3, 4, 5, 6, 7, 8
Safe Routes to School (SRTS)	✓	✓	✓	✓	-	1, 4, 5, 6, 7, 8
Future Town Core Plans	-	✓	-	✓	✓	1, 3, 4, 5, 6, 7, 8
Implement Existing Town Core Plans	✓	✓	✓	✓	-	1, 3, 4, 5, 6, 7, 8
Access to Transit	✓	✓	✓	✓	✓	1, 3, 4, 5, 6, 7, 8
Social Trail Identification	-	-	-	✓	✓	1, 3, 4, 5, 6, 7, 8
Pedestrian Safety Improvements	✓	✓	✓	✓	✓	1, 4, 5, 6, 7, 8

*See plan goals from Chapter 2

Priorities for Immediate Implementation (1-3 years):

Pedestrian Planning

- Implementation of pedestrian planning and design will be coordinated by a new multimodal planner position that will be assigned to work as part of both the Planning and Public Works Departments
- Establish a routine, ongoing pedestrian planning program that will be responsible for identifying and prioritizing the many small pedestrian infrastructure improvement projects needed across the island and ensuring that pedestrian needs and capital planning are specifically addressed in future area development plans
- Through development review require all future development plans to provide safe and convenient pedestrian infrastructure that is well connected both internally within new developments as well as to surrounding streets, neighborhoods, and bus stops

Safe Routes to School (SRTS)

- Identify and address the pedestrian access needs around all elementary, middle and high schools in Kaua'i by 2015

Town Core Plan Implementation

- Continue implementing pedestrian provisions of the Lihu'e Town Core Plan
- Develop a form-based code to guide the design of developments in town cores

Access to Transit

- The Department of Public Works will work with The Kaua'i Bus to identify sidewalk and crosswalk needs at all long term bus stops served by The Kaua'i Bus
- The County will make pedestrian access improvements around bus stops as the bus stops are upgraded (see Transit Program)

Social Trail/Path Identification

- Map and prioritize existing informal walk routes as part of district development plans

Pedestrian Safety Improvements

- Initiate an annual spot safety improvement program that analyzes annual pedestrian-involved accident data to identify hazardous intersections and streets and program them for improvement

PRIORITIES FOR MID-RANGE IMPLEMENTATION (2016-2020):

Pedestrian Planning

- Continue the pedestrian planning program that includes identifying and prioritizing small pedestrian infrastructure improvement projects and ensuring that pedestrian needs and capital planning are specifically addressed in future area development plans

Safe Routes to School

- Implement capital improvements necessary to support Safe Routes to School by 2020

Future Town Core Planning

- Develop town core plans for the larger towns across the island that identify primary pedestrian corridors and intersections for improvement

Town Core Plan Implementation

- Fully implement pedestrian provisions of the Lihu'e Town Core Plan
- Begin implementing pedestrian provisions of future town core plans as they are completed

Access to Transit

- Improve pedestrian access to bus stops as bus stops are upgraded

Social Trail/Path Identification

- Continue to map and prioritize existing informal walk routes as part of district development plans
- Protect high priority routes during development review
- Purchase and improve any high priority routes that are in danger of being lost due to development or other land use changes

Pedestrian Safety Improvements

- Continue the annual spot safety program that analyzes annual pedestrian-involved accident data to identify the hazardous intersections and streets
- Each year make necessary improvements to the one or two most dangerous intersections identified as part of the annual spot safety improvement program

Kaua'i

Multimodal Land Transportation Plan

CHAPTER 6D COUNTY ROADS PROGRAM

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COUNTY ROADS PROGRAM SUMMARY

County roads and streets provide the backbone of Kaua'i's land transportation system. Most people on Kaua'i travel by automobile for most trips (93% of all trips) and even if the County's policy target for mode splits is achieved, automobile trips (single-occupant vehicles and multiple-occupant automobiles) would still account for 77% of all trips in 2035. However, roads and streets are also where all bus trips and most walk and bicycle trips occur. Making necessary improvements to streets to accommodate all modes will be a critical aspect of achieving the goals of this plan.

Some of the key principles related to the county road network this plan addresses include:

- Maintaining the rural character in Kaua'i – including limiting highway widening;
- Designing streets that better accommodate all modes of transportation;
- Supporting protection of, and improvements to, designated scenic road corridors;
- Supporting freight transport, and in particular local agriculture;
- Reducing speeding, which has emerged as a critical safety issue across the island;
- Improving safety for all users of Kaua'i's streets; and,
- Preventing future traffic growth and additional congestion



County Roads Program Components

Upgrade Street Design Standards

- Implement "Complete Streets" policy through development of a Kaua'i Living Streets Manual
- Apply narrower cross-sections
- Address smart storm water design

Missing Link Connections

- Identify and prioritize bypass/alternative roads
- Identify future neighborhood to neighborhood connectors

Town Core Street Rehabilitation

- Implement improvements in the Lihue Town Core Plan
- Invest in street upgrades in other core areas to support economic vitality
- Upgrade maintenance in key corridors

Scenic Byways

- Invest in multimodal features that enhance the public's experience of scenic roadways
- Scenic Byway investments will be guided by the Corridor Management Plan

Network and Connectivity Standards

- Include in zoning and subdivision requirements
- Develop separate standards for motor vehicles, pedestrians and bicycles

Traffic Calming Mitigation

- Develop a toolkit of mitigation types appropriate to local roads
- Develop rules for prioritization of needed mitigation projects
- Develop a neighborhood project initiation process

Spot Safety Improvements

- Identify safety needs based on accident reports
- Address safety needs with annual spot improvements



BACKGROUND:

There are 394 miles of paved public roads in Kaua'i, and of those 72%, or 287 miles, are owned and maintained by the County (the other 107 miles are under Hawai'i DOT jurisdiction). County roads provide critical connections between neighborhoods, towns and state highways. They also make up most of the fine-grained, in-town street network throughout Kaua'i. Additionally, county roads are not just crucial to motor vehicle travel, but are where many transit, bicycle and walk trips take place. While this plan does not cover a state highway program (see the Hawai'i DOT Regional Long Range Land Transportation Plan), the county road program includes actions the County will take to improve the county road system and achieve many of the goals outlined in Chapter 2.

The contents of the county road program are driven by several key principles that meet the vision and goals of this plan (see Chapter 2) and/or received strong public support during the planning process (see Chapter 3). These include:

- **Limit road widening.** Most county roads are two lanes. In order to preserve the rural character of the island, a major goal of the county roads program will be to prevent multi-laning of roads wherever possible.
- **Accommodate all modes of transportation.** As part of the County's "Complete Streets" policy, new and re-constructed streets will be designed to accommodate multiple modes of transportation.
- **Support protection of and improvements to scenic road corridors.** With the designation of the Holo Holo Kōloa Scenic Byway (including Maluhia Road and other county roads in the Kōloa-Po'ipū area), Kaua'i County will have the opportunity to protect the visual character of some of the island's signature scenic corridors and vistas. Scenic Byway designation will also provide a means of obtaining state and



federal funds for appropriate improvements such as scenic pullouts, bicycle and pedestrian facilities and elimination of informal shoulder parking.

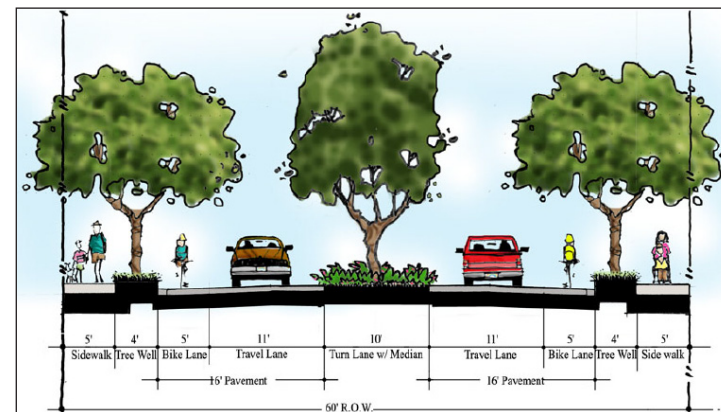
- **Support freight transport.** The county roads are a critical link for freight. This is especially important as it relates to the island's effort to increase the distribution of sustainable agriculture (more is discussed on this in the agriculture transportation program in Chapter 6E).
- **Reduce excessive speeding.** The highest posted speed limit in Kaua'i is 50mph and on most county roads the limit rarely exceeds 35mph. However, at every one of the district workshops, excessive motor vehicle speeding on county roads and neighborhood streets was raised as major safety concern, especially for children, pedestrians and bicyclists. To increase the safety of Kaua'i's streets and help preserve Kaua'i's relaxed island lifestyle, the county road program will apply measures to reduce speeding wherever possible.
 - **Improve the safety of streets for all users.** Safety, especially for children was often the number one concern at the public meetings held during the planning process. Children and the elderly are some of the most vulnerable and most likely to be walking on neighborhood streets. The county roads program will prioritize safety for these populations and all users of the streets in addition to motor vehicle users.
 - **Prevent future traffic growth.** Based on the Preferred Scenario analysis described in Chapter 5, the County has set a policy target of keeping traffic levels the same as they were in 2010 through 2035. While a major component of this will be strengthening other mode options, the county road program will strive to avoid creating incentives to increase motor vehicle traffic. Instead streets will be designed in an effort to make travel and access to buildings, parks, and other destinations just as easy using other modes as driving.

6D. COUNTY ROADS PROGRAM

GENERAL PROGRAM BY 2035:

Update Street Design Standards

The County of Kaua'i will work to implement the Complete Streets policy (adopted by the County in September, 2010) through the development of a Kaua'i Living Streets Manual. This includes updating design standards for county roads to accommodate all modes of transportation, including pedestrians, bicycles and transit where feasible and appropriate. Street design standards will include narrow cross sections that would help to deter speeding, encourage walking, and maintain the rural character of Kaua'i's streets (see Transportation Facility Design Standards in Chapter 6F, the Land Use Program). Street design standards will also address modern storm water design.



Example street section from the Lihu'e Town Core Plan, 2010



Missing Link Connections

Traffic volumes on some of Kaua'i's main highways and arterials are approaching capacity during peak hours, causing some motorists to experience long delays. As stated in the County's General Plan, and by most members of the public, widening highways is not desirable on most roads in Kaua'i, and would only provide a short term solution before latent traffic demand fills the new road lanes. A better approach is suggested by the fact that much of the traffic congestion in Kaua'i is caused by the absence of alternate routes. The County will focus on identifying and prioritizing bypass and alternate routes as well as direct neighborhood to neighborhood connectors. Alternate routes will be selected and prioritized not only by their ability to relieve traffic congestion, but by their effectiveness at improving emergency vehicle access, creating resiliency during natural disasters, and improving walking, biking and transit options.

Town Core Street Rehabilitation

Most of the shopping, business transactions, and cultural and civic events occur in Kaua'i's numerous town cores. Additionally many of the dangerous intersections occur in these town cores where there is a mix of foot, bicycle, and automobile traffic. For this reason, and to support continued economic vitality, the County will invest in street upgrades in the core areas (using design standards from the Kaua'i Living Streets Manual). The County will start by implementing the street upgrades and retrofits recommended in The Lihu'e Town Core Plan. The County will also upgrade maintenance in key county road corridors.



6D. COUNTY ROADS PROGRAM

Scenic Byways

The designation of 19 miles of county roads in the Kōloa-Poi'pū area as the Holo Holo Scenic Byway establishes Maluhia Road (a.k.a. "tree tunnel road") and other area roadways as protected corridors where the scenic vistas of mountains, forests, meadows and ocean as well as the physical road facilities themselves are protected and managed as an integrated resource. Designation brings with it the opportunity to make investments in features that enhance the public's ability to see and appreciate the scenic vistas and historic roads. These may include scenic pullouts at strategic locations. They may also include bicycle and pedestrian improvements and programs to curtail informal and unsafe shoulder parking. The County's efforts to support the Scenic Byway will be guided by the Corridor Management Plan developed pursuant to Federal Highway Administration requirements.

Network and Connectivity

Many of Kaua'i's neighborhoods and towns are served by only one street connecting to the external network. As a result, people making short trips are forced to travel via the main arterials and highways, contributing to traffic congestion. This poor neighborhood connectivity discourages biking, walking and transit use because the routes people must take are overly circuitous. To alleviate this issue in future developments, the County will include network and connectivity standards in zoning and subdivision requirements. As part of this process the County will develop separate connectivity standards for motor vehicles, pedestrians, and bicycles. (See the land use program in Chapter 6F for detailed connectivity standards).

Table 6-4: Summary of county roads program elements

Program Element	Capital	Federal Eligible	Priority			Goals Supported *
			Short Range	Mid Range	Long Range	
Update Street Design Standards	-	-	✓	-	-	1, 3, 4, 5, 6, 7, 8
Missing Link Connections	✓	✓	-	✓	-	1, 2, 3, 5, 6, 7, 8
Town Core Street Rehabilitation	✓	✓	✓	✓	✓	1, 3, 4, 5, 6, 7, 8
Scenic Byways	✓	✓	✓	✓	✓	1, 3, 4, 5, 8
Network and Connectivity Standards	-	-	✓	✓	-	1, 3, 4, 5, 6, 7, 8
Traffic Calming Mitigation	✓	✓	✓	✓	✓	1, 4, 5, 6, 7, 8
Spot Safety Improvements	✓	✓	✓	✓	✓	1, 4, 7, 8

*See plan goals from Chapter 2

Traffic Calming Mitigation

Public comments revealed that speeding is a significant safety issue in Kaua'i, particularly on neighborhood streets and county highways. The increased danger caused by speeding vehicles is a primary reason many people in Kaua'i said they are afraid to walk or bicycle or let their children walk and bicycle. Street design, and specifically traffic calming devices, are a proven effective means of reducing traffic speeds. To implement this, the County will begin by developing a toolkit of traffic calming mitigation types appropriate to local roads on Kaua'i. This could include speed tables, speed bumps, chicanes, narrower lanes, on-street parking, bulb-outs, stop signs, or a host of other strategies. The County will involve the police department and communities in identifying where traffic calming is most needed and what tool is most appropriate. In addition the County will develop rules for prioritizing needed improvements and establish a neighborhood project initiation process that involves the communities.



Example of a chicane to divert traffic in Boulder, CO

Spot Safety Improvements

Similar to the pedestrian spot safety program, the County will establish a program to actively monitor motor vehicle accident data on Kaua'i. The data will be used to identify the most dangerous streets and intersections for vehicles on the island, and help determine the necessary improvements needed to make those locations safer. Using this data the County will make annual spot improvements to the most dangerous intersections or street segments.

Priorities for Immediate Implementation (1-3 years):

Update Street Design Standards

- ➡ Implement Complete Streets policy through development of the Kaua'i Living Streets Manual
- ➡ Update County of Kaua'i Standard Details for Public Works Construction
- ➡ Update County of Kaua'i Roads Standard Details

Town Core Street Rehabilitation

- ➡ Begin implementing the street improvements from the Lihu'e Town Core Plan
- ➡ As part of the district development plans and town core plans, create a prioritize list of street improvement projects that would improve economic vitality in town cores

Scenic Byways

- ➡ Support completion of a Corridor Management Plan by the Holo Holo Kōloa Scenic Byway Work Group

Network and Connectivity

- ➡ Develop network and connectivity standards for motor vehicles, pedestrians and bicycles to be used in the zoning code and in subdivision requirements
- ➡ Include priority and road connectivity recommendations in the *6-Year Capital Improvement Report* as development and town core plans are approved
- ➡ Fund and implement priority road connectors

Traffic Calming Mitigation

- ➡ Develop a toolkit of traffic calming mitigation types appropriate to local roads on Kaua'i

Spot Safety Improvements

- ➡ Establish a spot safety program to monitor accident data and identify streets and intersections that would most benefit from safety improvements

Priorities for Mid-Range Implementation (2016-2020):

Missing Link Connections

- Identify and prioritize bypass/alternative roads
- Identify future neighborhood to neighborhood connectors

Town Core Street Rehabilitation

- Complete all street improvements recommended in the Lihu'e Town Core Plan
- Using a prioritized project list, make street upgrades in other town core areas

Network and Connectivity

- Implement new network and connectivity standards through zoning and the development/subdivision review process
- Fund and implement priority road connectors

Traffic Calming Mitigation

- Involve the police department and communities in identifying streets in need of traffic calming
- Develop rules for prioritization of needed mitigation improvements
- Develop a neighborhood project initiation process
- Implement traffic calming devices on streets identified as the highest priority

Spot Safety Improvements

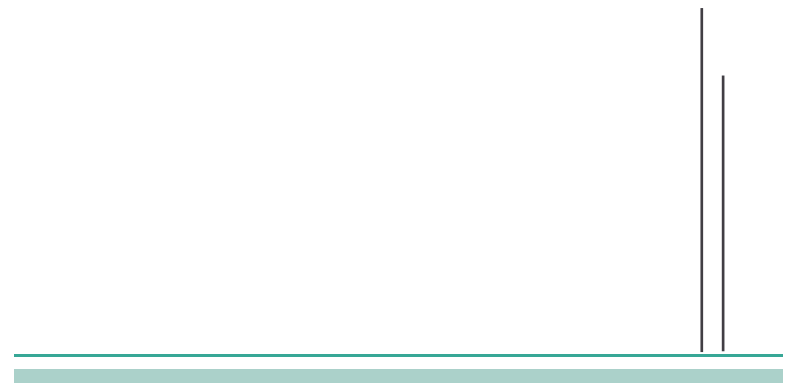
- Address safety needs with annual spot improvements to the areas identified with a high frequency of vehicular accidents

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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 6E AGRICULTURE TRANSPORTATION PROGRAM



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AGRICULTURE TRANSPORTATION PROGRAM SUMMARY

Efforts to improve the island's "food independence" and to develop "sustainable agriculture" are proceeding on a broad front across Kaua'i. Transportation is one of many issues to be resolved in encouraging growth in local agriculture and access to healthy foods, and it may take years for significant progress to be made on these fronts.

The County will focus its transportation efforts in these specific principles, forming the basis for the Program Components shown on the right:

- Reducing the cost of transporting and processing locally-grown farm products;
- Protecting against disruption of on-island transportation networks during storms and other emergency events;
- Improving access by residents and visitors to healthy foods, including locally-grown and raised fruits, vegetables, grass-fed beef, sea foods and dairy products; and,
- Ensuring agriculture workers have affordable and reliable access to their jobs.



Agriculture Transportation Program Components

Access to Important Agricultural Lands

- Complete Important Agricultural Lands (IAL) Study
- Analyze access needs for IAL areas; identify missing links in local public road networks
- Evaluate County subdivision regulations, state condominium laws, County accessory dwelling unit provisions and related County ordinances and policies to avoid unintended consequences of improved farm-to-market road system

Intermodal Storage, Processing and Transfer Site

- Confirm priority needs and determine how a facility should be funded and operated
- Site location and design study
- Take the lead in implementing facilities

Commute Access to Agricultural Employment

- Improve bicycle and transit access to agricultural jobs

Farm-to-Market Cooperative System

- Sponsor a feasibility study of a potential agricultural cooperative on Kaua'i for purposes of providing or coordinating the local physical distribution and logistics needs of small farms and ranches on Kaua'i.



6E. AGRICULTURE TRANSPORTATION PROGRAM

BACKGROUND

The Garden Isle has gone through two distinct agricultural phases and now is entering a third. Each phase has been characterized by unique transportation needs and challenges.

In Ancient Hawai'i (pre-European), Kaua'i was a subsistence farming society, where taro, banana, coconut, breadfruit, and sweet potato were grown and represented most of daily diets. Islanders also raised pork, chicken, and dog, although these meats were eaten less often than fruits, vegetables, and seafood. The only transportation available during these times was human powered – walking/carrying and canoes. As a practical matter, all distances were greater than they are today, lending an original meaning to the term, “locally-grown.”

During the plantation phase (mid 1800s through about 1995), sugar cane and pineapple were grown on large industrial-agricultural plantations. Bulk production of these commodities required both a high-capacity land transport system for farm-to-port logistics and a low-cost ocean shipping system for export to markets, primarily in the continental U.S. During the early part of this era, horse- and mule-drawn wagons provided land transportation, supplanted after 1880 by short line railroads and after 1930 by motor trucks. The island ports (Nāwiliwili and Port Allen) were crucial to the operation of this agricultural transportation system. During this phase virtually all of the plantation roadways and railroads were privately owned. Few miles of public roads were established in the upland areas of the island. As a result, most of the public roadway network on Kaua'i today is confined to level lands near the coast. Over the years, some of the former plantation roads have fallen into disuse and disrepair. Others have been repurposed to serve new agricultural uses, to expand coastal highway routes, or to support suburban development.

Beginning in the late 1980s, global price-based competition reduced the acreage devoted to both sugar cane and pineapple throughout Hawai'i, a trend that accelerated after 1995. Kaua'i entered a third phase where large areas of agricultural lands lay fallow and unused, other than a guava plantation near Kilauea and occasional small orchards and farms. The opportunity represented by fallow lands has led to the two trends that characterize the third phase of Kaua'i's agricultural history.



First, global companies have established row crop fields on former sugar cane lands, primarily on the western side of Kaua'i. Most of this land is used to grow corn for seed and research, although soy bean, wheat, sunflower, and other seed crops are also grown. Seed farms have been important to the island economy, although the employment per acre is lower than most other forms of agriculture, including the former sugar and pineapple plantations.

A second, more recent trend has been the rise of a nascent, but fast-growing small-scale agriculture sector. From taro farms on the North Shore (which have been there for hundreds of years), to numerous small fruit plantations on the East Side and North Shore, to coffee plantations west of Kalāheo, to vegetable gardens, to upland grass-fed beef ranching, to goat farms and dairies, there is a resurgence of locally-grown and raised foods on Kaua'i. Over a dozen weekly farmers' markets, a rapidly growing farm-to-table economy and the reappearance of fresh, local fruits and vegetables in markets and groceries across Kaua'i are generating employment and improving residents' access to healthy foods.

6E. AGRICULTURE TRANSPORTATION PROGRAM

These two trends in Kauaʻi agriculture will require specific transportation systems for each of these different industries. The seed crop companies rely on a heavy truck freight land transport system for inputs (fertilizer and other chemicals) and for transportation to ports. As with the original plantation crops, seed crops are shipped to global markets by sea. Nāwiliwili Port continues to be a key resource for this industry, but Port Allen is no longer actively used for freight transportation. Other than a generalized concern about congestion on state highways, the transportation systems required for this industry are largely in place.

The diversified, small-scale enterprises that make up the second sector – farms and ranches growing local products primarily for consumption in Kauaʻi or export to Oʻahu – represent a transportation service challenge. The transportation costs borne by these businesses are a barrier to further growth and development. They tend to be small and independent. Their products are not well-suited to large-scale, commodity-style marketing, storage and transport systems. Many of these business distribute produce in small trucks or personal cars and log high mileage daily as they connect to markets and outlets around the island. State and federal food safety and other agricultural regulations have reduced the availability of storage and processing facilities in Kauaʻi and in Hawaiʻi generally, especially for grass-fed beef. Finally, these enterprises require much more labor per unit of production and per acre than the row crop operations. Many of these jobs are relatively low-paid and as a result the cost of commuting to work represents a significant barrier to recruitment and retention of farm workers.



Taro fields. North Shore

A final practical challenge facing the “local food” enterprises is the fact that the Kauaʻi population is too small to support a large agricultural sector. If Kauaʻi is to grow its agriculture into a significant source of employment and income, it must be able to ship produce to Oʻahu, to the neighbor islands, and to other global markets. This will require better intermodal connections at the airport and at Nāwiliwili Port, better storage (including cold storage), and better processing facilities to meet the requirements of export markets.

These inherent labor and transportation inefficiencies must be addressed if Kauaʻi is to develop the kind of sustainable, locally-grown and consumed foods that citizens (and visitors) are now demanding. Kauaʻi will need public policies, programs and projects that reduce the costs of transporting diversified produce, that solve storage and processing deficiencies, that improve intermodal connections for export, and that support affordable commuting to work by farm workers. While not all of these are purely “transportation” problems, this transportation plan is designed to provide a logistics framework that will lead to eventual solutions for all of them.

6E. AGRICULTURE TRANSPORTATION PROGRAM

GENERAL PROGRAM BY 2035:

Access to Important Agricultural Lands

During the plantation era, most movement of agricultural inputs (chemicals, seed, labor) and outputs (sugar cane, pineapples) took place on private roads within the vast plantations. The large, highly-connected network of “farm-to-market” roads that characterize the agricultural areas of the South, the Midwest and California were not developed on Kauaʻi (or on any of the Hawaiian islands). From the edge of the plantations, goods moved in both directions on what are now state highways and a few county roads, but within the plantations, they moved on private roads. This lack of a farm-to-market collector road network presents policy questions and choices for the County.

To the extent that future agriculture on Kauaʻi takes place on large farms and ranches, the old plantation roads may be adequate to serve the local end of farm-to-market connections. However, to the extent that small farms, ranches, dairies, orchards and similar enterprises make use of former plantation lands that are not adjacent to the primary island highways, there may be a need for strategic road improvements. Some of the roadways needed to serve these areas currently may not be public roads, which will lead to questions and policy choices about potential dedication of former plantation roads as public rights of way and facilities. There could even be some need in certain areas for development of new public roadways on new alignment.



These issues could give rise to unintended land use consequences. One of the problems nationwide with the farm-to-market road system has been its role in supporting rural sprawl, particularly in areas near large urban centers. The paving and upgrading of rural collector roadways (in most cases with federal funds) from the 1960s through the early 1990s represented a major source of subsidy to the far-flung sprawl rural subdivisions that plague many parts of the nation.

Once the County completes its “Important Agricultural Lands” (IAL) study, the data and information gleaned from that effort will help guide County policies for rural roads. The County will follow the IAL study with an analysis of access needs for IAL areas and will identify missing links in local public road networks. The relationship between these needs and County subdivision regulations, state condominium laws, County accessory dwelling unit provisions and related County ordinances and policies will be evaluated with an eye to supporting development of local agriculture on Kauaʻi without fueling development pressure on IAL areas.

County policies will follow these three principles to evaluate access suitability:

1. Priorities for rural farm-to-market roadways will be highest for Important Agricultural Lands that are inaccessible from the current public road network and that are being brought into active, long-term cultivation by small farms and ranches engaged in sustainable production of fruits, vegetables, grass-fed beef, dairy goods and related products for local, statewide and export markets.
2. Road infrastructure policies and practices of the County related to subdivision of land will be updated to address agricultural subdivisions such that access needs are resolved prior to or concurrent with subdivision.
3. The County will not use public funds to support access to “condominium property regimes” (CPRs), and will not approve private CPR access roadways greater in length than what is specified by the County, as measured from the nearest public road intersection.

6E. AGRICULTURE TRANSPORTATION PROGRAM

Intermodal Storage, Processing and Transfer Site

The viability of a diversified agricultural sector in Kauaʻi will depend, in part, on the ability to export produce to the other Hawaiian islands, especially Oʻahu, and to a lesser extent the ability to export to global markets.

To the extent such products can move by air, the Lihūʻe commercial airport may be able to play a major role (as it does today) in serving the intermodal needs of export markets. However, some types of produce are not amenable to air freight transport (because of low price to weight ratios). Also, some products must be refrigerated (poi and beef, to name two examples), adding to the weight and cost of air transport. Finally, the cost of jet fuel will increase in coming years, affecting the cost and feasibility of air transport of agricultural produce out of Kauaʻi.



Nāwiliwili freight harbor, Kauaʻi

Although only relatively small amounts of Kauaʻi's produce move to market by sea today, inter-island transport represents one potential means of expanding Kauaʻi's future access to export markets, particularly to Honolulu. For inter-island export by sea to be feasible, a series of related challenges must be solved, including ensuring Kauaʻi's agricultural enterprises have access to the required inspection, processing, storage and intermodal facilities near or at Nāwiliwili Port. These same needs arise for air transport of agricultural products, so a facility or group of co-located facilities potentially could be sited near either the airport or the seaport and serve both.

The County will work with state and federal agencies and with Kauaʻi's farmers and ranchers to confirm the highest priority needs and to determine how an intermodal agricultural facility should be funded and operated. The County then will undertake a site location and design study to identify facility needs, potential locations and site layout options. The potential impacts of including a slaughter facility in the Intermodal Storage, Processing and Transfer Site shall be carefully evaluated as part of this study. Finally the County will take the lead in advancing this concept with the objective of solving the current lack of inspection, processing, storage and intermodal facilities for export produce and agricultural products by 2020.

Commute Access to Agricultural Employment

The trend in the United States for over a hundred years has been toward reduced labor inputs in agriculture systems and products. Midwestern farmers now manage thousands of acres of corn and beans with only one or two employees – generally part-time, temporary jobs with no benefits. Western ranchers manage vast operations with small seasonal crews. Even the truck farms in California have steadily replaced labor with machinery wherever possible.

But sustainable agriculture on Kauaʻi – fruits, vegetables, coconuts, goat dairies, taro, grass-fed beef and so forth – will require a relatively high ratio of labor inputs. Taro is harvested by hand as are some fruits and vegetables. Growing “organic” foods without pesticides and herbicides requires direct labor to manage weeds and pests, often almost daily. If diversified small enterprise agriculture is to thrive on Kauaʻi, it will require much higher labor inputs than most other forms of agriculture. Most of that employment necessarily will be at relatively low pay rates if this industry is to be economically viable and able to compete with products from modern industrial food delivery systems.



So agricultural workers will face extraordinary challenges in balancing household budgets. The “H + T Index” (housing and transportation costs as a percent of household income) presented in Chapter 4 will exceed sustainable levels – and this type of employment will not be feasible – unless the cost of commuting for agricultural workers can be kept as low as possible.

6E. AGRICULTURE TRANSPORTATION PROGRAM

With only a few exceptions, most agriculture workers drive to work on Kaua'i today. In the future, it will be important that these jobs be accessible by means other than driving. In some areas of the North Shore, the South Side and West Side bicycling will play a key role. Where employment is concentrated at specific locations (e.g., North Shore taro farms), the County will continue working to improve the availability of bus transit service for these workers. The projects and programs described in the bicycle and transit sections of this chapter provide more details about these improvements.

Farm-to-Market Cooperative System

Every day, a fleet of privately-owned cars, pickups and small trucks circulates around the island carrying produce to farmers' markets, grocery stores and markets, processing and packaging facilities, and subscribers' homes. Some farmers personally drive over 100 miles daily making deliveries and picking up supplies. These costs are difficult for small enterprises to carry – both in terms of direct vehicle operations and in terms of the time involved. For a fruit grower or a goat dairy to absorb two or three hundred dollars per day in transport costs is not sustainable. The lack of a coordinated transportation system for local distribution of farm, orchard and dairy products represents a significant barrier to the growth of Kaua'i's agriculture industry.



Historically, the American agriculture industry has turned to cooperatives as a means of solving physical distribution problems. For example, Midwestern corn and bean farmers belong to cooperatives that own fleets of rail cars. This enables them to avoid the chronic rail car shortages that arise when commodity prices are high. Being part of the cooperative lowers their transportation costs and increases the prices they obtain for their crops. There are many kinds of agricultural coops worldwide, playing different roles as needed in specific locations and economic situations.

Hawai'i has had a long and not always positive experience with "farm coops," beginning back in the sugar and pineapple era. Local cooperatives do exist today, including the Kona Pacific Farmers Cooperative and Hamakua North Hilo Agricultural Cooperative, both on the Big Island. However, there is no entity currently involved on Kaua'i in coordinating local physical distribution needs of small, diversified agricultural enterprises. The Hawai'i Farm Bureau Federation has played a role in negotiating lower air transport costs for Hawai'i farm produce, and perhaps could play a role in coordinating local transportation. Hawai'i Statutes (Chapter 421) provides enabling authority and governing regulations for Agricultural Cooperative Associations. The University of Hawai'i College of Tropical Agricultural and Human Resources (CTAHR) runs a Co-operative Extension Service, although physical distribution and logistics are not currently part of its mission.

Kaua'i would benefit from development of an agricultural cooperative that provides or coordinates transportation, delivery, and perhaps storage and other services for small agricultural enterprises. The County will conduct a study to determine the feasibility and potential benefits of developing a local agricultural cooperative to coordinate or provide physical distribution and logistics services for small, diversified agricultural enterprises. The objectives of this study will be to:

1. Document and quantify the transportation cost burden associated with local distribution and delivery of agricultural products between farms and markets on Kaua'i and between Kaua'i and inter-island export markets.
2. Consult with farmers, ranchers and others involved in Kaua'i agriculture to determine willingness to participate in a farm coop oriented toward physical distribution services.
3. Determine feasibility of a agriculture transport cooperative on Kaua'i. Describe a recommended organizational structure, mission and financial characteristics of a co-operative.
4. If feasible and supported by those involved in agriculture on the island, sponsor or otherwise take the lead in helping to form an agricultural cooperative for purposes of providing or coordinating the local physical distribution and logistics needs of small farms and ranches on Kaua'i.

Priorities for Immediate Implementation (1-3 years):

Access to Important Agricultural Lands

- ➔ Complete Important Agricultural Lands (IAL) Study

Intermodal Storage, Processing and Transfer Site

- ➔ Confirm priority needs and determine how a facility should be funded and operated
- ➔ Complete business plans for needed facility/facilities and seek funding

Farm-to-Market Cooperative System

- ➔ Sponsor a feasibility study



PRIORITIES FOR MID-RANGE IMPLEMENTATION (2016-2020):

Access to Important Agricultural Lands

- Analyze access needs for IAL areas; identify missing links in local public road networks
- Evaluate County subdivision regulations, state condominium laws, County accessory dwelling unit provisions and related County ordinances and policies to avoid unintended consequences of improved farm-to-market road system

Intermodal Storage, Processing and Transfer Site

- Conduct site location and design study
- Take the lead in implementing facilities

Commute Access to Agriculture Employment

- Make improvements to bicycle facilities (described in the bicycle program, Chapter 6B) and bus transit service (described in the transit program, Chapter 6A) to better access agricultural employment centers

Farm-to-Market Cooperative System

- If feasible, take the lead in forming an agricultural cooperative for purposes of providing or coordinating the local physical distribution and logistics needs of small farms and ranches on Kaua'i

Table 6-5: Summary of agriculture transportation program elements

Program Element	Capital	Federal Eligible	Priority			Goals Supported *
			Short Range	Mid Range	Long Range	
Access to Important Agriculture Lands	✓	✓	✓	✓	-	2, 3, 4, 5, 6, 8
Intermodal Storage, Processing and Transfer Site	✓	✓	✓	✓	-	2, 3, 4, 5, 6, 8
Commute Access to Agricultural Employment	✓	✓	✓	✓	✓	1, 2, 3, 4, 5, 6, 8
Farm to Market Cooperative System	✓	✓	✓	✓	-	2, 3, 4, 5, 6, 8

*See plan goals from Chapter 2

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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 6F LAND USE PROGRAM

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LAND USE PROGRAM SUMMARY

Kaua'i's future – its quality of life, its economic vitality, its viability as a tourism destination, and its public health – will be determined to a substantial extent by how well the development of its land use patterns and transportation systems are coordinated. Setting a course for a desired land use development pattern without explicitly addressing the role of transportation would result in failure. Planning a transportation system without the guidance of clear community land use objectives would lead to aimless spending and wide ranging unintended consequences.



The County's plans for land use are guided by the County General Plan, which will soon be updated. The land use program included in this section draws policy direction from the General Plan and, based on that, identifies specific needs and approaches for integrating the County's transportation program with its growth management systems. It has also been guided by the three principle requirements for sustainable development:

- Compactness;
- Completeness; and,
- Connectedness.

Generally the County's most urgent growth management needs can be captured under the heading, "keeping Kaua'i rural," which means, among other things, "not suburban."

Land Use Program Components

Improving Land Use Mix

- Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to allow, encourage and in some cases require a more mixed land development pattern, including active living, convenience retail, fresh food, third places, medical and health, civic buildings and housing type variety elements.
- Guide new mixed-use developments, as well as mixed-use infill and redevelopment projects pursuant to changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance.

Embedding Parks and Schools in Neighborhoods

- Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to require well-planned schools and parks within subdivisions and other development projects.
- Guide new developments, as well as infill and redevelopment projects to incorporate well-planned schools and parks pursuant to changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance.

Building Connected Networks for Travel, Circulation and Access

- Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to require well-connected internal street and transportation facility networks within subdivisions and other development projects with frequent connections to abutting areas.
- Guide new developments, as well as infill and redevelopment projects to incorporate well-connected internal networks with good connections to abutting areas pursuant to changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance.
- Improve connectivity within existing towns and villages by completing missing links with new County streets.

Adopting Transportation Facility Design Standards

- Develop and adopt new Transportation Facility Design Standards addressing street cross-sections, lane widths, pedestrian needs, green streets provisions, traffic calming measures, and roundabouts.
- Guide new developments, as well as infill and redevelopment projects to conform to the County's Transportation Facility Design Standards.
- Apply Transportation Facility Design Standards to design of all projects to improve County transportation infrastructure.

BACKGROUND

Kaua'i is a rural place. The island is recognized and admired internationally as one of the world's most beautiful places and as an important travel destination. But regardless of this worldwide renown, Kaua'i is a rural island.

Traditionally, rural areas are made up of villages, towns and small cities as well as the working lands and bodies of water that surround them. Working lands can include farms, ranches, commercial forests, and extraction sites as well as parks, beaches, bodies of water, recreation areas, and preserves.



Aerial view of historic Kōloa Town surrounded by open agricultural lands

Kaua'i's towns were originally sited at transportation hubs – sea harbors and crossroads, some of which were sites of small villages and settlements that pre-dated the arrival of Europeans. The towns themselves were built around commercial “main streets” near relatively compact, walkable neighborhoods, and with infrastructure that served their civic, cultural, and social needs. The working lands surrounding the towns often provided the reason for their existence, and continue to do so in some places. Thus, the rural landscape was integral to the social and economic life of the community. This pattern prevailed on Kaua'i until at least 1950.

Although Kaua'i is rural, most of its people live, not in the country, but in its villages, towns and one small city (Līhu'e). This town and country relationship has been the historical pattern in most rural regions throughout the nation. But over the past fifty years across the U.S., the rural landscape has begun to take on a hybrid form – suburbanization – which spreads homes into residential subdivisions distant from traditional population centers and their associated commercial services and employment. This trend has affected Kaua'i significantly over the past two decades.

Places that are suburban are no longer rural and yet are not urban. They are not rural because former working lands have been consumed by the low density development pattern and the people living in the homes do not derive their incomes from the remaining open lands. They are not urban because urban amenities, services, retail, restaurants, civic institutions, schools and employment centers are generally not embedded within the “neighborhoods.” Either these urban features are missing entirely, or they are placed along arterial highways with little or no direct physical relationship to the nearby residential areas. Thus, suburban areas tend not to have actual “neighborhoods” in the traditional sense of that word.

Suburbanization is a development pattern that is well understood by the homebuilding industry, and is relatively easy and inexpensive to build, due primarily to low land and infrastructure costs. Throughout the 20th century, suburban places attracted most of the market for new housing throughout the U.S. However, the new dynamics of the post-petroleum economy combined with the preferences of the millennial (emerging) and boomer (retiring) generations are shifting the market away from suburbs and back into urban places across most of the U.S.

While these economic and demographic trends can be seen in parts of Hawai'i, it is likely that there will be continued momentum on Kaua'i toward suburban development patterns. This is true in part because of the prevalence of second and vacation homes in the new housing market. It is also a result of the fact that the island's villages, towns and city have lost many of the amenities and features of traditional town core areas that might draw people back into them.

6F. LAND USE PROGRAM

However, there are countervailing forces at work on Kauaʻi too. Perhaps the most important is the impact of daily driving on individuals and households. As described in Chapter 4 and Appendix E, Kauaʻi residents are traveling an average of 35 miles each day, of which an average 28 miles are in cars. (Residents of the West Side are traveling an average of 51 miles daily and residents of the North Shore are traveling 48 miles.) These trips are taking longer as queues on the island's primary state highways lengthen and congestion delays increase. It is also impacting household budgets. As shown in Chapter 4, the average household on Kauaʻi spent just under \$15,000 for transportation in 2010, representing 24% of median household income. Rising fuel costs and the increasing need to drive for daily activities, combined with high housing costs, is threatening the economic viability of half or more of the island's households.



At public workshops held as part of developing this plan (see Chapter 3) Kauaʻi residents expressed a desire to reduce the cost and time required for all this driving. This trend is helping to propel a rapid increase in transit ridership (see Section 6A). It is also compelling people to reconsider where they live. Part of the high mileage is due to the concentration of jobs in Lihue and a few other locations. However, only about a fourth of daily trips by Kauaʻi residents are commute trips. Much of daily driving is associated with running errands, hauling children to activities, and other non-commute purposes. These are the trips that traditionally (before 1960) were made by walking and bicycling to a much greater extent than they are today. The decline in active transportation – walking and bicycling – in Kauaʻi is impacting the population in other ways. According to the federal Centers for Disease Control and Prevention, only about 57% of Kauaʻi's adults are getting the minimum recommended amount of daily exercise,

and as a direct result, about 54% of Kauaʻi's adults are either overweight or obese. (See Chapter 4.) The data for children is even more alarming, as indicated by steep increases nationally in the percentage of children who are inactive and overweight.

If the County is to intervene in these trends, future development and redevelopment in Kauaʻi must take on three characteristics – it must be compact, complete and connected. These three over-riding principles are described below.

1. **Compact.** There are many reasons why it is not in Kauaʻi's interests to have its rural lands consumed by low density subdivisions. The loss of productive agricultural lands and scenic vistas, the increase in traffic congestion and time spent driving, the loss of rural character and heritage, the damage to the island's desirability as a travel destination – these are all contrary to what citizens say they want and inconsistent with the County's General Plan. While some limits to the horizontal spread of development are exerted by the State's Land Use laws, these will not be enough, alone, to halt the trend. The County's land use regulations and transportation system planning and design must present a united front in discouraging and preventing unnecessary expansion of the extent of suburban development.



Waimea, on Kauaʻi's West Side, depicts relatively compact development with a mixed-use town core

6F. LAND USE PROGRAM

2. **Complete.** Before 1960, most of Kaua'i's neighborhoods and communities were complete in the sense that all of the services, functions and opportunities that people needed as part of daily life were available within their neighborhoods or at least nearby. Jobs might be located in city centers or other employment centers farther away, but all of the basic non-work needs could be met most of the time by walking, bicycling and occasional short auto trips.



Complete neighborhoods reduce the amount of travel required for such life elements as raising children, getting to school, shopping for family necessities, operating a business, participating in community activities and aging in place. In Kaua'i today, we can still see some of these characteristics in the core areas of Lihu'e, Waimea and Kōloa, as well as other towns. However, they are generally absent from the newer rural subdivisions, which are – by design – limited to residential land uses. For example, the average Kaua'i resident today reports living 3.1 miles from the nearest grocery store, a distance that encourages driving.

3. **Connected.** Connectivity means having access to a network of transportation facilities that support direct, efficient travel between origins and destinations. Kaua'i has some inherent disadvantage at the regional scale because – like all of the Hawaiian islands – its development is located almost entirely near the coast and direct cross-island travel is rendered impossible by the mountainous landscape. However, poor connectivity at the local level – within towns and neighborhoods – is a direct, but avoidable result of traditional design. Housing developers avoid costs by building limited, poorly-connected street “networks,” and they use circuitous street layouts to add exclusivity and value to prime building sites. New neighborhoods are often not directly connected to existing, nearby neighborhoods because of NIMBY opposition from residents. However, in connected neighborhoods, people drive fewer miles, saving money in the process, and are more physically active. Emergency services are more effective and the ability to respond to natural disasters (hurricanes, etc.) is enhanced. High levels of connectivity will be an essential characteristic of future development in Kaua'i.



The combined effects of applying the compact, complete and connected principles will lead not only to more livable places across Kaua'i, they will reduce daily driving without reducing access or mobility. Comparative data from neighborhoods across the U.S. has shown that the combination of locally-mixed land uses and connected street networks can reduce daily vehicle miles of travel per affected household by as much as 25% to 50%. The increased walking and bicycling associated with these land use patterns have a self-leveraging effect: the presence of people along the street and in public places attracts more people, building neighborhood and social capital. The presence of landmarks and mixed-use centers gives identity and character to neighborhoods. The results - increased local retail sales, increased social cohesion and sense of community, less driving and more active living offer compelling benefits for residents of Kaua'i.

6F. LAND USE PROGRAM

GENERAL PROGRAM BY 2035

This Multimodal Land Transportation Plan is designed to use the County's transportation investments and programs to support development of neighborhoods and communities that are more compact, complete and connected. This is important, not only to help the County achieve its General Plan vision, but to reduce the cost and increase the effectiveness of the island's transportation systems. At the same time this will help households reduce their transportation costs and improve their personal health, and it will help ensure that Kaua'i remains competitive as an appealing destination for visitors and travelers.

The objective of this section is to set forth how the County will bring transportation and land use programs into alignment. However, this plan does not specify the exact form that policies, regulations, programs or rules should take. Some of these provisions could be implemented by adding mixed-use zone districts to the Comprehensive Zoning Ordinance or to the County's Subdivision Ordinance. Others could be incorporated into the General Plan Update and then applied in area Development Plans, as appropriate.

Improving Land Use Mix

The County will work to ensure that future land development addresses and, to the extent possible, meets the requirements of complete neighborhoods. The most important elements to be factored into land use mix would be:

1. **Active Living** – sidewalks, trails, parks, access to open space and beaches



2. **Convenience Retail** – convenience retail shopping (food, drugs, sundries) in footprints that are economically viable, depending on the location and the size of the development (footprints will range from about 500 square feet up to about 2,500 square feet)



3. **Fresh Food** – small footprint retail space, spaces in parks and plazas for local farmers' markets, other intermittent food markets, and community-supported agriculture (subscription farming) outlets



4. **Third Places** – coffee shops and cafes (with outdoor seating), bookstores, libraries, churches, taverns, plazas, senior centers, community centers, art galleries, theaters



5. **Medical and Health** – offices and clinics, yoga studios, dance studios, gyms, etc.



6. **Civic Buildings** – county offices, police substations, public outlets (permit sales, etc.)



7. **Variety of Housing Types** – a mix of price ranges and home sizes, including both owner-occupied and rental dwellings, and both single family and multi-family building types



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Embedding Parks and Schools in Neighborhoods

The County will work cooperatively with developers, land owners, existing neighborhoods and state agencies to ensure that appropriately-designed and reasonably-sized public parks and schools are embedded within neighborhoods or are located adjacent to multiple neighborhoods with direct access from county streets and trails.

The County will work with the State Department of Education to develop modern provisions for school site sizes and layout requirements on Kaua'i. Oversized school sites are unnecessary, expensive and damaging to neighborhood fabric and development patterns. Fenced school sites represent misguided policies to protect children from largely non-existent threats. Social cohesion, tight-knit neighborhoods and active transportation are much stronger forces for protecting children than fences and walls. Such organizations as the National Clearinghouse for Educational Facilities, the Environmental Protection Agency, and Safe Routes to School National Partnership have published data and guidelines that are detailed and appropriate for 21st century public and private school needs.

In new neighborhoods, the County will ensure that bicycle and pedestrian routes are included in master plans for subdivisions and other large development projects so that these active transportation networks provide functional, safe connections between parks, schools and homes. Internal to development projects, these facilities will be the responsibility of the developers. The County will work with developers to share cost and responsibility for external connections to regional active transportation networks outside of developments (trails, sidewalks and bike lanes). The rate at which this is done will be limited by County funding. However, delay in making external connections shall not be a reason to defer or postpone development of active transportation routes within subdivisions and development projects.

Building Connected Networks for Travel, Circulation and Access

The County will ensure that connected networks are developed throughout the developed parts of the island. These networks will achieve minimum connectivity for all modes (motor vehicles, transit buses, bicycles and pedestrians), and will achieve that connectivity at both the local/internal level (within development sites and neighborhoods) and regional/local (between neighborhoods and areas). This will take some years to fully accomplish, but the first step in the process is to ensure that no more poorly-connected subdivisions are approved or built. Gated subdivisions represent unacceptable limitations on connectivity and shall not be allowed.

- **Street Connectivity.** For streets, network standards will be set by ordinance for local and collector streets. Larger developments will include small block sizes with a high intersection density, numerous through streets, and will be well connected to the outside street network. The block structure need not be strictly rectilinear and may adapt to landscape and topography. However, intersections shall be orthogonal wherever possible and offset intersections (doglegs) shall be avoided. Confusing, circuitous network configurations will not be allowed.

For larger sites, external connections to adjacent parcels and neighborhoods shall be frequently spaced along the perimeter of the development (adjusted proportionate to project scale) and shall connect with existing streets in abutting properties at a frequency that reasonably matches the existing street network on adjacent sites. Smaller sites shall have similar standards, subject to limitations of dimensions of the site, topography and other physical factors.

The County will require that all streets built for public access to more than one parcel and general circulation within subdivisions and other large developments shall be dedicated as public streets and given over to County jurisdiction and public use.

6F. LAND USE PROGRAM

The County will ensure that a collector street network is developed concurrently with land development, such that an average minimum collector street spacing ("grid scale") as specified by the County is achieved in developed areas, subject to reasonable variations due to landscape and topography. Developers will be held responsible for the sections of such a grid that fall within their sites. The County will work to make missing link connections that are not reasonably the responsibility of a specific developer, subject to availability of funds. However, delay in the County's ability to provide these external collector connections shall not be a reason to defer or postpone the private sector development of those sections of collectors that fall within subdivisions and other development projects. Some built parts of Kaua'i today do not have a well-connected collector street network. The County will work with landowners and developers to extend collector streets where needed. In some cases there will be a need to pay for certain collector streets with public funds.

Finally, the County will require that internal street networks in new developments be extended to the perimeter of the development at a specified minimum spacing. If the abutting lands are undeveloped, these local streets will be "stubbed" to the property line. If abutting lands are already developed the County will help the developer obtain permissions and approvals to make connections into the abutting street networks, recognizing the likelihood of NIMBY opposition to street connections that the developer could not, on their own, resolve.

- **Public Transit Connectivity.** The Kaua'i Bus (TKB) will operate primarily on arterial roadways (state highways) and collector streets. The collector network (see above) will provide the corridors for future bus routes within neighborhoods and districts. The grid scale to be used in planning the County collector street network will result in appropriate spacing for a functional public transit network. As part of the review and approval of development and redevelopment projects, the County will require that locations be identified and infrastructure be installed for bus stops.



Bus stop spacing in developed areas shall generally be provided at 600 to 1,000 feet intervals depending on density of development, subject to limitations of landscape and topography. Bus stop locations shall be directly connected to sidewalks and crosswalks and shall be placed on tangent sections of roadways with adequate sight distance. Bus pullout bays shall be provided at bus stops on streets with posted speeds above 35mph or forecast traffic (within 20 years) of more than 5,000 vehicles per day, but shall not be required on low-speed, low-volume streets.

- **Pedestrian Connectivity.** The County intends that, in the future, all inhabited areas of the island will have provisions for safe, direct, convenient and dignified pedestrian access and circulation. Sidewalks, walkways, crosswalks and trails will be present throughout the developed areas of Kaua'i.



Adequate sidewalks, crosswalks and trails currently are missing from many parts of Kaua'i. Over time, the County will plan, design and build such facilities within existing built areas as a high-priority emphasis of the County street program. However, the County will also require commercial properties applying for substantial redevelopment or infill development to supply sidewalks and walkways consistent with County standards as a condition of development approval.

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All future new subdivisions and other development projects will fully meet the ubiquitous pedestrian facility requirement. Sidewalks generally shall be provided on both sides of every street, regardless of length or forecast traffic, including cul-de-sacs and stub-outs for future streets. Exceptions may be allowed for very short streets with few dwelling units. The small scale of local streets (see above) will generally be adequate to provide the basic pedestrian network required for neighborhood circulation. Where streets do not meet this minimum connectivity, all-weather walkways through blocks and across large parcels will be provided and dedicated for public access and use. Where such walkways meet streets, the County will determine whether mid-block pedestrian crossings are appropriate, and if so they will be required. In commercial, civic, institutional and multi-family residential projects, any parking lot of over an acre in extent will be bisected by a protected walkway directly oriented to the most important pedestrian vector.

➤ **Bicycle Connectivity.** The County intends that, in the future, all inhabited areas of the island will have provisions for safe, direct, and convenient bicycle access and circulation. Facilities may include bike lanes, off-street pathways and trails, and streets designated as bicycle routes.

The bicycle program (Chapter 6B) calls for Town Connector Trails, Town and Village Bicycle Lanes, Multi-Use Coastal Trails and Other Multi-Use Trails. These facilities may be mixed and combined in specific areas to achieve minimum spacing for bicycle facilities as appropriate. As a broad policy, the County will provide (or require from developers) on-street bicycle lanes on collector streets wherever possible, subject to site specific design issues and availability of funding. On-street bicycle lanes will not be provided or required on low-speed, low-volume local streets (speeds < 30mph and traffic < 5,000 vehicles per day) unless unique circumstances indicate a site-specific need (e.g., near a school). Coastal and other multi-use trails will be developed by the County subject to specific planning and design studies addressing specific needs. However, the County may require developers of larger projects to provide on-site trails if needed for access to schools, or if needed to make connections to current or planned regional trail corridors.

The County will work to achieve an overall bicycle grid-scale similar to the general local street grid-scale. Facilities that provide continuity for longer trips will be placed at about the same frequency as collector roads. Finally, redundancy between off-street trail corridors and on-street bicycle lanes is beneficial and the presence of one shall not preclude the development of the other.



The County will work with Hawai'i DOT to encourage development of modern, well-designed bicycle lanes on all of the state highways on Kaua'i. This will take years to complete, so the highest priority should be placed on:

1. Corridors that provide access between neighborhoods and schools;
2. Locations with recent bicycle/motor vehicle collisions; and,
3. Corridors that offer significant potential for recreational use.

Adopting Transportation Facility Design Standards

The County will develop and update standards for the design of streets and other transportation facilities as a critically-important aspect of implementing this plan. Design standards will apply both to public sector investments by the County and to private sector investments by land owners, developers and businesses.

Design standards shall emphasize these four design principles:

1. **Low Speeds.** High speed streets offer no value on Kaua'i, either with respect to "congestion relief" or with respect to reduced travel times. Congestion on roadway networks is due primarily to inherent conflicts and time allocation requirements of intersections, which cannot be alleviated by allowing or encouraging higher speeds between intersections. Kaua'i will continue to be a rural island where driving speeds are low: 15 to 25mph on local streets; 25 to 35mph on collector streets, and 35 to 50mph on arterials (state highways).

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2. **Safety.** Safety of pedestrians, bicyclists and motorists is of paramount importance in the design of transportation facilities on Kauaʻi. Research has shown that personal safety is not enhanced by congestion alleviation measures or by designs that increase vehicle speeds. The occurrence of minor property damage accidents (“fender benders”) that do not involve personal injuries shall not be used as a justification for speed increases or facility expansions.
3. **Complete Streets.** The County has adopted a Complete Streets policy; that policy shall be incorporated into design of all county roads and streets.
4. **Minimum Footprint.** The County will work to minimize both the space consumed by, and the ecological impacts of, roads and streets. “Ecological impacts” in this context means impacts to water and air quality, wildlife habitat and other critical natural resources, view sheds and vistas, and noise levels.

The County will develop transportation design standards that are multimodal and that reflect the priorities and directions described in each of the program sections of this Chapter. These shall include the standards set forth below.

Definitions used in these standards include:

Multi-lane. “Multi-lane” means more than one through lane in each direction with left turn accommodation as required.

Street. As used here, “street” refers to a County roadway that abuts or is within 500 feet of residential or commercial land uses. The County shall treat facilities as streets based on both current and future land uses.

Yield Street. A “yield street” is a two-way street with on-street parking on one or both sides of the street, staggered driveways, and a 16-foot through-put cross section between parked cars or between parked cars on one side and a curb on the other.

- **Street Cross Section.** Multi-lane roadways are fundamentally inconsistent with the adopted General Plan vision for Kauaʻi. Other strategies described in this Chapter will be more effective than widening of roadways in meeting the goals and objectives of the County. The County will work with the Hawaiʻi DOT to minimize multi-lane cross sections on the state highway system on Kauaʻi because of the profound damage to island character and safety that such facilities cause, coupled with the lack of clear, long-term benefits. West of Kalāheo and north of Kapaʻa, the County will not build new county roads or streets or widen existing county roads and streets to more than one through lane in each direction coupled with left turn accommodation as required. Within the central portion of Kauaʻi (defined by the General Plan as generally between Kalāheo and Kapaʻa), the County will avoid as much as possible building new county roads or streets or widening existing county roads and streets to more than one through lane in each direction coupled with left turn accommodation as required. Right turn acceleration and deceleration lanes shall be used only where compelling safety considerations indicate an overriding need for them. Two-way left turn lanes shall not be used, except where absolutely necessary because of existing driveways and intersection spacing.
- **Lane Width.** The County will develop design standards that minimize lane widths within existing best engineering practice. On local streets, lane widths shall generally be 10 or 11 feet. The County may use 9 foot lanes where appropriate and may build or allow yield streets in residential settings. The County will build or allow 12 foot lanes primarily on collector roads and streets where daily traffic exceeds 5,000 vehicles per day and posted speeds will be higher than 40mph.
- **Pedestrians.** Pedestrian walkways shall be provided on both sides of County streets in developed areas. New and reconstructed town, village and subdivision streets shall include walkways in the initial construction and the County will work over time to add pedestrian accommodation where missing from existing streets in developed areas. New streets, and wherever possible, reconstructed streets shall provide a “pedestrian realm” that includes a walkway that is set back from the adjacent street. Pedestrian walkways shall be designed to minimum widths based on County street standards. Such standards shall take into account local context and shall be sensitive to community character.

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- **Green Streets.** The County will develop and improve roads and streets such that they incorporate modern best practices for storm water management. Direct outflows into surface waters of the island or into the sea without removal of sediments, as well as other water quality management techniques, shall not be allowed. Designs shall be developed and applied that minimize off-site delivery of storm flows. Trees and vegetation requirements shall be incorporated into street design standards for all types of roads and streets, with the objectives of providing shade, enhancing the visual esthetics, and improving the ecological function of roadway corridors.
- **Traffic Calming.** The County will develop a toolkit of accepted traffic calming devices and designs that may be used as retrofits on County streets. Traffic calming measures shall be appropriate where needed to slow traffic on local streets and improve safety for pedestrians and bicyclists. Traffic calming measures may also be used to discourage cut-through traffic on local streets, but care shall be taken not to divert such cut-through traffic to other local streets. Traffic calming measures shall be appropriate on collector streets only where unusual circumstances require them. The toolkit may include such designs as speed tables, raised pedestrian crossings, chicanes, curb extensions, medians, diverters, pedestrian refuges and other techniques consistent with modern traffic engineering.
- **Roundabouts.** The County will develop or allow roundabouts on County roads and streets in certain circumstances to improve traffic flow and vehicular safety. The County will exercise care in locating and designing roundabouts at intersections near schools or in areas where the volume of pedestrians is high today or expected to be high in the future. The County will develop engineering criteria for selecting roundabouts over other types of intersection traffic control designs and will rely on Federal Highway Administration guidelines for determining suitable locations for roundabouts and for making roundabout design decisions.

Priorities for Immediate Implementation (1-3 years):

Improving Land Use Mix

- Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to allow, encourage and in some cases require a more mixed land development pattern, including active living, convenience retail, fresh food, third places, medical and health, civic buildings and housing type variety elements.

Embedding Parks and Schools in Neighborhoods

- Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to require well-planned schools and parks within subdivisions and other development projects.

Building Connected Networks for Travel, Circulation and Access

- Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to require well-connected internal street and transportation facility networks within subdivisions and other development projects with frequent connections to abutting areas.

Adopting Transportation Facility Design Standards

- Develop and adopt new Transportation Facility Design Standards addressing street cross sections, lane widths, pedestrian needs, green streets provisions, traffic calming measures, and roundabouts.

Updating Community Development Plans

- As community development plans are updated, including those currently under development, implement land use provisions of this section.

PRIORITIES FOR MID-RANGE IMPLEMENTATION (2016-2020):

Improving Land Use Mix

- Guide new mixed use developments, as well as mixed use infill and redevelopment projects pursuant to changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance.

Embedding Parks and Schools in Neighborhoods

- Guide new developments, as well as infill and redevelopment projects to incorporate well-planned schools and parks pursuant to changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance.

Building Connected Networks for Travel, Circulation and Access

- Guide new developments, as well as infill and redevelopment projects to incorporate well-connected internal networks with good connections to abutting areas pursuant to changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance.
- Improve connectivity within existing towns and villages by completing missing links with new County streets.

Adopting Transportation Facility Design Standards

- Guide new developments, as well as infill and redevelopment projects to conform to the County's Transportation Facility Design Standards.
- Apply Transportation Facility Design Standards to design of all projects to improve County transportation infrastructure.

Updating Community Development Plans

- As community development plans are updated, including those currently under development, implement land use provisions of this section.

Table 6-6: Summary of land use program elements

Program Element	Capital	Federal Eligible	Priority			Goals Supported *
			Short Range	Mid Range	Long Range	
Improving Land Use Mix	-	-	✓	✓	✓	1, 3, 4, 5, 6, 8
Embedding Parks and Schools in Neighborhoods	-	-	✓	✓	✓	1, 3, 4, 5, 6, 8
Building Connected Networks for Travel, Circulation and Access	-	-	✓	✓	✓	1, 3, 4, 5, 6, 8
Adopting Transportation Facility Design Standards	-	-	✓	✓	✓	1, 3, 4, 5, 6, 8

*See plan goals from Chapter 2



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Kaua'i

Multimodal Land Transportation Plan

CHAPTER 7 IMPLEMENTATION



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7. IMPLEMENTATION

OVERVIEW

This Multimodal Land Transportation Plan has been designed to support an action-based approach to meeting Kaua'i's mobility, circulation and access needs. If progress toward transportation objectives can be advanced ahead of oncoming land development pressures it may be possible for the County to effectively shape the island's growth patterns to the benefit of both residents and visitors. Key components of implementation are shown in the box below.

Key Implementation Components

Priorities

- ➔ Guidelines for Prioritizing Programs and Projects
- ➔ Priorities for Public Investment

Funding the Plan

- ➔ Multimodal Approach to Planning
- ➔ Multimodal Approach to Funding and Prioritization
- ➔ Supporting Transit Program Development

Short Term Action Plan

- ➔ Action Plan Summary Table

Performance Monitoring and Reporting

- ➔ Monitoring Key Variables
- ➔ Performance Reporting

For the foreseeable future, resources available to the County for implementation of this transportation plan – as for all programs and activities – will be limited. Especially limited will be county staff capacity, county revenues and budget, and space on County agendas, given dockets that are already crowded with multiple issues and needs. Because of these practical limitations on resources, three strategies will be paramount.

1. **Investing resources in the most important things first.** This requires having clear transportation objectives and clear priorities for transportation investments that will lead to achievement of objectives.
2. **Avoiding programs, projects and actions that are unnecessary and that lead to unintended consequences.** For the past three to four decades federal, state and local transportation programs across the U.S. have been caught in a cycle of inertia and momentum inherited from the heyday of road building that followed World War II. Now with vehicular travel reaching a long-term plateau, the primary impact of rural roadway expansion is the unintended impact of encouraging the horizontal expansion of suburban development at the expense of towns, villages and cities. Kaua'i cannot afford aimless roadway spending driven by Mid-20th Century congestion alleviation concepts.
3. **Performance measurement and reporting.** It will be important for the County to evaluate the actual performance of its transportation program as well as the trajectories of ongoing demographic and economic trends. To be effective, this reporting should be routine and transparent – open to public view.

These strategies guided development of the Implementation Components shown in the box at left, which are described in the following paragraphs.

7. IMPLEMENTATION

PRIORITIES

Traditional public sector transportation planning has tended to obscure the logic and basis for investment priorities – to the extent they have even existed. Kauaʻi County transportation priorities, by contrast, are based on the guidelines and priorities described below.

Guidelines for Prioritizing Programs and Projects

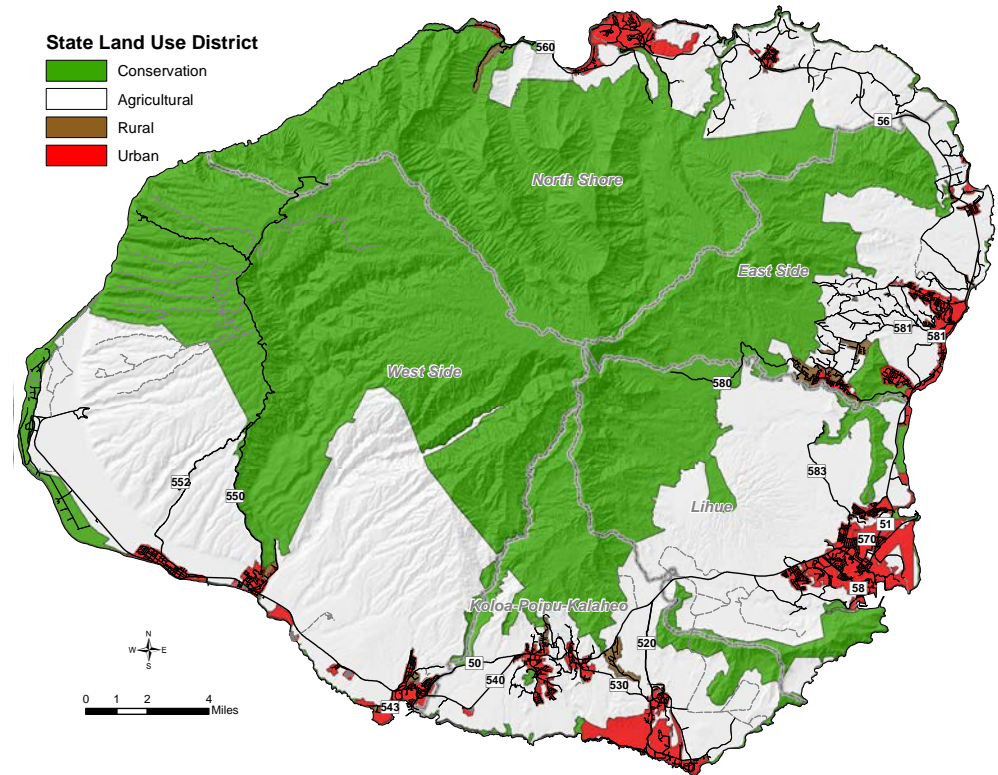
1. The County will grow transit service levels as described in Chapters 5 and Section A of Chapter 6 in support of the overall objective of preventing further long term growth in vehicle miles of travel.
2. The County will substantially improve the safety and convenience of walking and bicycling in Kauaʻi as part of a broad-based effort to improve public safety, public health and quality of life, and as part of an overall economic strategy of making Kauaʻi competitive as a destination for low-impact tourism.
3. The County will avoid rural roadway expansion projects that increase development pressure on rural lands, especially lands classified by the State Land Use Commission as Agricultural and Conservation (see Figure 7-1). Where rural road expansion projects are urgently needed for capacity or emergency management purposes, impacts to rural lands will be prevented through rigorous application of access management controls, limiting intersections and driveways accessing Agricultural and Conservation lands.
4. The County will emphasize transportation policies, programs and projects that reinforce the economic viability and livability of existing town and village core areas.
5. The County will prioritize its transportation improvement program in support of the land use principles set forth in Section F of Chapter 6 – specifically that Kauaʻi's inhabited areas will be compact, complete and connected.

Priorities for Public Investment

The box on the next page shows how the County will prioritize its investment of resources using the following classification of priority:

- **Highest Priority.** These programs, projects and actions shall have the highest priority for use of available funds and revenues, for grant applications to state and federal governments, for project development activities (including environmental studies and design development), and for allocation of County staff time and effort.

Figure 7-1: State of Hawaiʻi Land Use Commission land use district map for Kauaʻi



- **Moderate Priority.** These programs, projects and actions shall be priorities for County investment, subject to availability of adequate resources, once the highest priorities have been funded and initiated.
- **Actions and Projects To Be Avoided.** These programs, projects and actions are not generally consistent with County objectives and priorities and, except in extraordinary circumstances, should not be programmed for funding, should not be proposed for inclusion in grant applications to state and federal governments, and should not be the focus of project development activities, including environmental studies and design development.

Priorities for Public Resources

Highest Priority

Studies, Plans, Ordinances and Actions

- Updates to the Comprehensive Zoning Ordinance and County Subdivision Ordinance pursuant to Section F of Chapter 6 (Land Use Program)
- Studies, plans, and cooperative actions to increase transit efficiencies and revenues
- Ongoing pedestrian planning program
- Multimodal planner assigned to the Planning and Public Works Departments
- Long-range, island-wide bicycle network plan
- Updated standards for street design and connectivity
- Studies to determine feasibility and location of Intermodal Storage, Processing and Transfer Site, and feasibility of Farm-to-Market Cooperative System

Public Transit (The Kaua'i Bus) – Capital and Operations

- Ongoing actions required to maintain vehicles and facilities in “state of good repair”
- Continued bus stop and shelter improvements
- Increased service levels on commuter bus routes
- Develop a County of Kaua'i bulk-rate discount bus pass program

Pedestrian System - Capital and Operations

- Ongoing actions required to maintain facilities in “state of good repair”
- Sidewalks, crosswalks and walkways for safe routes to school and access to bus stops
- Implementation of spot pedestrian safety program
- Projects to implement Lihu'e Town Core Plan and community development plans

Bicycle System - Capital and Operations

- Ongoing actions required to maintain facilities in “state of good repair”
- Projects to implement Lihu'e Town Core Plan and community development plans

County Roads - Capital and Operations

- Ongoing actions required to maintain facilities in “state of good repair”
- Projects to implement Lihu'e Town Core Plan and community development plans

Moderate Priority

Bicycle System – Capital and Operations

- Town pair connector projects
- Town and village bicycle lanes
- Coastal and other multi-use trails
- Rural bicycle lanes
- Projects to implement future Town Core plans
- Bicycle parking at activity centers

County Roads – Capital and Operations

- Spot safety improvement projects
- “Missing link” county road projects within existing developed areas
- Traffic calming mitigation toolkit and projects
- Projects to implement future town core plans and community development plans

Agricultural Transportation – Capital and Operations

- Actions to implement Intermodal Storage, Processing and Transfer Site and Farm-to-Market Cooperative System

Actions and Projects To Be Avoided

Bicycle System – Capital and Operations

- Designation of rural bicycle “routes” without adequate provision for safety at bridges and intersections

County Roads – Capital and Operations

- Rural add-lanes and widening projects
- Urban add-lanes and widening projects unless called for in Town Core plans
- Rural new alignment roadways

7. IMPLEMENTATION

FUNDING THE PLAN

As a small, rural county, Kaua'i will not be able to simply "buy" all of the needed transportation programs, projects and other actions described in this plan. Although the County is emerging from the 2008-09 recession and is seeing increases in visitorship and modest job growth, County budgets will be constrained by slow growth in revenues and long lists of needed services and capital investments across a broad range of programs. This plan sets forth a multimodal approach to funding the County's needs as a way to avoid certain expenditures and improve the efficiency of the future transportation system. It also provides a more detailed funding plan for public transit, given the importance of that program to achieving the Preferred Scenario.

Multimodal Approach to Planning

A key strategy for funding this plan will be to elevate and emphasize the multimodal nature of Kaua'i's transportation system. Synergies between programs will be sought out and prioritized, while divisions or barriers between programs will be reduced or eliminated.

Specifically, the Departments of Transportation, Planning and Public Works will continue ongoing progress toward a multimodal approach emphasizing "complete streets" as a priority, where in previous decades the mission was seen as improving "county roads." The Transportation, Planning and Public Works Departments will collaborate in planning, designing and building pedestrian, bicycle and transit facilities as a shared mission. Roads and streets improvements will continue to be important, particularly with respect to "state of good repair" priorities, but an expanded emphasis will be placed on those improvements that further the County's multimodal vision. The new multimodal planner position will work with all three departments to undertake system, network and project planning for implementation of the pedestrian, bicycle and county road elements of Chapter 6. Continued planning by the staff of the County Executive on Transportation will be closely coordinated with this work.

To enhance coordination between the Public Works, Planning and Transportation departments and to achieve the greatest possible integration of funding and investment, the Technical Advisory Committee set up to oversee development of this Multimodal Land Transportation Plan will be converted into a permanent Transportation Coordinating Committee (TCC) with additional membership. The TCC will meet at least quarterly and more often than that as needed.

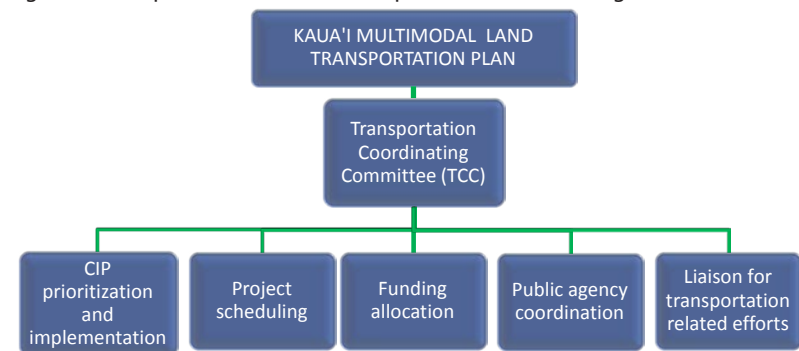
Membership of the Transportation Coordinating Committee will be as follows:

- One representative of the County Planning Department
- One representative of the County Public Works Department
- The County Executive on Transportation
- One representative of the Hawai'i DOT
- One representative of the Kaua'i County Office of Economic Development (OED)
- One citizen active in promoting transportation programs

The Planning, Public Works and OED members shall be appointed annually by the respective department directors. The Hawai'i DOT representative shall be appointed by the District Engineer for the Kaua'i District. The citizen appointment shall be made by the Mayor for a term of one year. Examples of organizations from which the citizen member could be drawn yearly include Get Fit Kaua'i, Kaua'i Path, Poi'pū Beach Resort Association, Kaua'i County Farm Bureau, or a representative of the Native Hawaiian community. The TCC shall select a chair from among the ranks of its members annually.

The primary mission of the TCC shall be to oversee implementation of this Multimodal Land Transportation Plan (see Figure 7-2). The Committee will work to coordinate the scheduling and funding of projects across the modal elements – transit, pedestrian, bicycle and county roads and streets. The Committee Chair shall meet at least quarterly with the Mayor and shall report on outcomes of the TCC deliberations.

Figure 7-2: Responsibilities of the Transportation Coordinating Committee (TCC)



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The TCC will build on and coordinate with a wide range of ongoing efforts, including the Built Environment Task Force and Safe Routes to School Task Force of the Get Fit Kaua'i program, the Safe Routes to School county coordinator, and the County's implementation of the Complete Streets policy through design standards updates, as well as the various access to healthy foods, food safety and farm-to-table programs. Finally the TCC will work to implement the County's new 6-Year Capital Improvements Program process for transportation projects and will coordinate closely with Hawai'i DOT to ensure that County high-priority projects are included in the Statewide Transportation Improvement Program.

Multimodal Approach to Funding and Prioritization

Although most local and regional transportation programs in the U.S. operate within modal "silos" as transit programs, road programs, and so forth, the Kaua'i County transportation program will be inherently multimodal. The Transportation Coordinating Committee will work to help the four participating County departments (transportation, public works, planning and economic development) coordinate and integrate their activities of such that the potential efficiencies and cost savings are achieved.

The TCC shall be responsible for advising the County departments and the Hawai'i DOT on transportation system development and project priorities. The TCC will use the prioritization system – "Priorities for State and County Investment" – set forth above in this chapter to review and advise on project level priorities, working to ensure that the Highest Priority programs, projects and other actions are in fact given the highest priority and that programs, projects and other actions described as Actions and Projects to be Avoided are not brought forward.

Finally, the TCC shall be responsible for considering and recommending, as warranted, potential new revenue sources and other approaches to funding the transportation program. The TCC may consider such sources and strategies as transportation impact fees, special districts, potential state legislation giving Counties new or revised authority, and reallocation or prioritization of State transportation program expenditures and investments. The Committee's role in this respect shall be advisory to the County departments represented on the TCC and to the Hawai'i DOT.

Supporting Transit Program Development

The Preferred Scenario calls for significant growth in transit service levels and ridership. Growth from 2012 to 2020 would represent a doubling of current service and ridership. This is in line with current trends and reflects expected demand. Over the 15 years between 2020 and 2035, transit services and ridership would effectively triple. So, while growth over the next eight years would follow recent trends, continued growth beyond 2020 must be steeper to meet objectives. (See Chapter 5 for more details.)

Section A of Chapter 6 identifies four general strategies for meeting the funding challenge inherent in achieving these increases. These are:

1. Increased Operational Efficiency
2. Increased Operating Revenue
3. Increased External Funding
4. Increased County Appropriations

Table 7-1 below shows how these strategies would come together in the operating budget for County transit services. The operating budget includes both fixed-route, scheduled service and demand response services provided for the transportation disadvantaged. It does not include capital expenditures, which are treated separately in transit program accounting systems.

Table 7-1: Planned operating costs and operating revenues for The Kaua'i Bus

	2012 Estimated	2020 Plan	2035 Plan
Fixed-Route Weekday Ridership	2,671	5,896	18,079
Annual Operations Cost (thousands)	\$5,757	\$8,974	\$31,560
Operating Ratio	14%	20%	30%
Operating Revenues (thousands)	\$800	\$2,200	\$9,400
Net Operations Costs (thousands)	\$4,957	\$8,974	\$22,160

The transit program section (6A) details elements of strategy 1 that are aimed at improving the already strong operating efficiency of TKB (see Chapter 4). These elements include converting the bus fleet to sustainable power, converting appropriate mainline route(s) to shuttles and streamlining mainline bus routes to avoid commercial parking lots. Another key element of strategy 1 (increased operating efficiency) will be to cap growth in demand response/trans-

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portation disadvantaged (DR/TD) services at roughly today's levels. As fixed-route, scheduled services are improved and expanded much of the daily DR/TD demand can be met through improvements to regular, scheduled bus routes. This is an important efficiency because the per-ride cost of DR/TD services is much higher than for fixed-route, scheduled services. Some highly-specialized needs will continue to require demand response service, but this forecast assumes total DR/TD demand will top out at just above 2012 levels (roughly 200 rides per day).

Strategy 2 calls for increasing operating revenues. Specific elements of this are described in the transit program section (6A), but an overall theme is to increase The Kaua'i Bus (TKB) "operating ratio" from about 14% today to 20% in 2020 and 30% by 2035. The operating ratio is the percentage of transit agency operations and maintenance cost that is earned back through fares, passes, contracts and other operating revenues. TKB is at 14% currently, which is low compared to all transit agencies nationwide, although not out of line for smaller agencies.

A strategy of increasing the operating ratio is healthy for transit agencies, as it reduces their reliance on grants and appropriations, makes them more resilient, and leads to an emphasis on customer relations as opposed to governmental relations. TKB will work to increase its operating ratio through updates to its pass pricing, through innovative bulk discount pass programs, and through expansion of revenue sources, perhaps including advertising revenues.

Also, on the revenue side, the third strategy – increasing external income – will be an essential component of growing transit services in Kaua'i. This will help with capital needs, which are not reflected in Table 7-1, but it will also help with funding operations. On the capital side, some of TKB's most significant capital needs represent good candidates for federal discretionary grants. For example, converting the fleet to sustainable power, developing remote maintenance and vehicle storage sites, implementing modern fare collection systems, and implementing geo-locator systems are all directly in line with emerging federal priorities and grant applications for these needs are likely to be competitive. Also on the capital side, if Kaua'i moves forward with transportation impact fees on development, such a revenue stream could be used to buy buses, expand facilities or make other capital investments related to growth in travel demand.

With respect to increasing external income to support the operations costs, the County will bring private sector partners into funding arrangements for circulators that serve specific areas – e.g., North Shore or Kōloa-Po'i'pū. Resort associations or other resort-based groups will play a key role in helping fund such transit services, thereby offsetting some of the budget needs shown in Table 7-1.

The County will also work with the State of Hawai'i to increase the participation of state government in regional transit system costs. This may require legislation, and if so, would require coordination among the Neighbor Island Counties. However, state funding participation in regional transit services is a national trend – one that should be considered in Hawai'i.

Finally, the bottom line in Table 7-1 shows estimates for how much County transit appropriations may have to grow over time to achieve the service levels and ridership needed for success at implementing the Preferred Scenario. These estimates do not assume that an impact fee source is established, that state participation in regional transit increases, or that public-private partnerships generate new revenues. So to some extent Table 7-1 overstates required County appropriations. Because there are uncertainties relative to funding and implementing the transit program, the plan has been structured to show more modest growth from now to 2020 followed by more aggressive growth between 2020 and 2035. This will give the County the opportunity to implement the actions in this plan and then reassess the feasibility of the long range plan in 2021. (See Monitoring and Reporting on page 7-11.)



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SHORT TERM ACTION PLAN

Table 7-2 Abbreviations

TKB - The Kaua'i Bus

DPW - County Department of Public Works

CPD - County Planning Department

HDOT - Hawai'i Department of Transportation

Table 7-2: One to three year action plan

Program	Program Subsection	Action Item	Lead Agency	Supporting Agency
Transit Program	Bus Stops	Install shelters at bus stops with the highest priority as funding permits	TKB	HDOT, DPW
		Complete a conceptual design study for the top 25 busiest stop locations	TKB	HDOT, DPW
	Operating Revenue	Gradually increase monthly pass rates to be more in line with single-ride fares	TKB	-
		Develop and implement a discounted, bulk-rate commuter pass program that will allow employers to provide paid passes for their employees	TKB	-
		Reach an agreement with KCC to extend bus pass program for students	TKB	Kaua'i Community College (KCC)
		Coordinate with HDOT and the Neighbor Island County transit agencies to develop a plan for modernizing transit fare collection to smart cards and transition away from cash fares	TKB	HDOT, Neighbor Island County Transit Agencies
	Digital Services	Establish a GPS-based route and schedule information system (trip planner) using Google maps or a similar program	TKB	-
		Install GPS tracking devices on TKB	TKB	-

Program	Program Subsection	Action Item	Lead Agency	Supporting Agency
Transit Program	Marketing and Information	Increase information and amenities available online, including route maps, real-time bus tracking, updates/news, pass sales, commuter tool kits and feedback	TKB	-
		Initiate a marketing program aimed at attracting more visitors and tourists to use the TKB	TKB	Kaua'i Visitors Bureau
	Improve Commuter Service	Add weekday frequencies to mainline routes	TKB	-
		Expand weekday hours of service and provide more weekend service	TKB	-
		Streamline mainline routes	TKB	-
	Fleet Conversion to Sustainable Power	Work with the County Administration, the State of Hawai'i and Neighbor Island County transit agencies to identify a long term fuel alternative that would work statewide	?	County Administration, TKB, HDOT, Neighbor Island County Transit Agencies
		Identify a local supplier of B20 biodiesel - to be used in the interim while a long term alternative fuel solution is determined	TKB	-
	Bus Maintenance and Storage Facilities	Identify suitable locations on the North Shore and West Side for the County to use for satellite bus storage/washer facilities	TKB	CPD
		Compete for capital grants to make improvements to bus maintenance and storage facilities	TKB	-
		Develop a plan to retrofit the existing (Lihue) bus facility to extend the length of one or more maintenance bays to accommodate 40' urban buses and to support alternative fuels	TKB	-

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Program	Program Subsection	Action Item	Lead Agency	Supporting Agency
Bicycle Program	Bicycle Planning	Implementation of bicycle planning and design will be coordinated by a new multimodal planner position that will be assigned to work as part of both the CPD and PWD	CPD	PWD, County Administration
		Develop a long range island-wide bicycle network plan by the end of 2015	CPD	HDOT, PWD, TKB, Kaua'i Path, Parks and Recreation
		Prioritize the list of desired projects from the bicycle plan for implementation	CPD	HDOT, PWD, TKB, Kaua'i Path
	Town Connector Trails	Develop corridor concept plans (general route, major structures, and right of way issues) that are sufficiently well-defined to support program-level cost estimates	PWD	CPD, HDOT, Kaua'i Path, TKB
		Identify priorities for town connector routes taking into account demand, feasibility, and connections to key bus stops along The Kaua'i Bus routes	PWD	CPD, HDOT, Kaua'i Path, TKB
		Begin capital programming and implementation of town connector trails identified as the highest priority as part of the island-wide bicycle network plan	PWD	-
	Town and Village Bicycle Lanes	Implement bicycle lanes in the Lihue core area based on recommendations in the Lihue Core Area Plan	PWD	CPD, HDOT, TKB
	Multi-Use Coastal Trails	Continue East Side Trail development	PWD	Kaua'i Path
		Identify future coastal trails for development	PWD	CPD, Kaua'i Path, Parks and Rec.
	Other Multi-Use Trails	Kaua'i County should work with its partners in the state and federal government to identify multi-use trails connecting recreational destinations	PWD	CPD, Kaua'i Path, Parks and Rec., State Parks, Hawai'i Dept. of Land and Natural Resources
	Bicycle Parking	Update the zoning code to require bicycle parking be provided for new developments at a rate of 8% of the auto requirement	CPD	-

Program	Program Subsection	Action Item	Lead Agency	Supporting Agency
Pedestrian Program	Pedestrian Planning	Implementation of pedestrian planning and design will be coordinated by a new multimodal planner position that will be assigned to work as part of both the CPD and PWD	CPD	PWD
		Establish a routine, ongoing pedestrian planning program that will be responsible for identifying and prioritizing the many small pedestrian infrastructure improvement projects needed across the island	PWD	CPD
		Through development review require all future development plans to provide safe and convenient pedestrian infrastructure that is well connected both internally within new developments as well as to surrounding streets, neighborhoods, and bus stops	CPD	PWD, TKB
	Safe Routes to School	Identify and address the highest pedestrian needs around all grade schools	PWD	CPD, TKB
	Town Core Plan Implementation	Continue implementing pedestrian provisions of the Lihue Town Core Plan	PWD	CPD, TKB, HDOT
		Develop a form-based code to guide the design of developments in town cores	CPD	-
	Access to Transit	The Public Works and The Kaua'i Bus will work together to identify sidewalk and crosswalk needs at all long term bus stops served by The Kaua'i Bus	PWD	TKB, HDOT
		The County will make pedestrian access improvements around bus stops as the bus stops are upgraded	PWD	TKB, CPD, HDOT
	Social Trail/Path Identification	Map and prioritize existing informal walk routes as part of district development plans	CPD	PWD
	Pedestrian Safety Improvements	Initiate an annual spot safety improvement program that analyzes annual pedestrian-involved accident data to identify hazardous intersections and streets and program them for improvement	PWD	Kaua'i Police Department, Hawai'i Traffic Safety Section

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Program	Program Subsection	Action Item	Lead Agency	Supporting Agency
County Roads Program	Update Street Design Standards	Implement the complete streets policy through the development of the Kaua'i Living Streets Manual	PWD	CPD, TKB, HDOT
		Update County of Kaua'i Standard Details for Public Works Construction	PWD	CPD, HDOT
		Update County of Kaua'i Roads Standard Details	PWD	HDOT
	Town Core Street Rehabilitation	Begin implementing the street improvements from the Lihu'e Town Core Plan	PWD	CPD, TKB, HDOT
		As part of the district area plans and town core plans, create a prioritized list of street improvement projects that would improve economic vitality in town cores	CPD	County Office of Economic Development, PWD, HDOT
	Scenic Byways	Support completion of a Corridor Management Plan by the Holo Holo Kōloa Scenic Byway Group	PWD	Holo Holo Kōloa Scenic Byway Group
	Network and Connectivity Standards	Develop network and connectivity standards for motor vehicles, pedestrians and bicycles to be used in the zoning code and in subdivision requirements	CPD	PWD, TKB
	Traffic Calming Mitigation	Develop a toolkit of traffic calming mitigation types appropriate to local roads on Kaua'i	PWD	Kaua'i Police Dept., Kaua'i Fire Dept., CPD
	Spot Safety Improvements	Establish a spot safety program to monitor accident data and identify streets and intersections that would most benefit from safety improvements	PWD	Kaua'i Police Dept., Hawai'i Traffic Safety Section, HDOT

Program	Program Subsection	Action Item	Lead Agency	Supporting Agency
Agriculture Transportation Program	Access to Important Agricultural Land	Complete Important Agricultural Lands (IAL) Study	UH Dept. of Urban and Regional Planning (DURP), UH Economic Research Organization (ERO)	CPD, Kaua'i Farm Bureau, State Land Use Commission
	Intermodal Storage, Processing and Transfer Site	Confirm priority needs and determine how a facility should be funded and operated	CPD	Hawai'i Dept. of Agriculture, HDOT, US Dept. of Agriculture, Kaua'i Farm Bureau
	Farm-to-Market Cooperative System	Sponsor a feasibility study	CPD	Hawai'i Farm Bureau, UH College of Tropical Agriculture and Human Resources (CTAHR)

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Program	Program Subsection	Action Item	Lead Agency	Supporting Agency
Land Use Program	Improving Land Use Mix	Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to allow, encourage and in some cases require a more mixed land development pattern, including active living, convenience retail, fresh food, third places, medical and health, civic buildings and housing type variety elements.	CPD	-
	Embedding Parks and Schools in Neighborhoods	Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to require well-planned schools and parks within subdivisions and other development projects.	CPD	State Dept. of Education
	Building Connected Networks for Travel, Circulation and Access	Develop and adopt changes in the Comprehensive Zoning Ordinance and Subdivision Ordinance to require well-connected internal street and transportation facility networks within subdivisions and other development projects with frequent connections to abutting areas.	CPD	TKB, PWD, HDOT
	Adopting Transportation Facility Design Standards	Develop and adopt new Transportation Facility Design Standards addressing street cross sections, lane widths, pedestrian needs, green streets provisions, traffic calming measures, and roundabouts.	CPD	PWD, TKB, HDOT, Kaua'i Fire Dept.

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MONITORING AND REPORTING

This is the first Multimodal Land Transportation Plan developed for Kauaʻi County. It contains policies and priorities that to some degree represent a departure from past practice. As such, it will be important for the County to carefully monitor and evaluate how the redirected transportation program is performing. It will also be important to provide as much transparency and accountability as possible so that the general public can observe performance of the transportation program and gauge how they feel about the policies and priorities.

The plan has been designed to include three implementation periods – a short-range period from adoption of the plan through 2015, a mid-range period from 2016-2020, and a long-range period from 2021 to 2035. The plan will be updated in 2021 based on program outcomes and progress during the mid-range period. To support this update, the County will prepare Transportation Report Cards in 2016 and 2020. Preparation of these data reports will be organized and managed by the Transportation Coordinating Committee. The reports will be presented to the Mayor and to County Council and will be made available to the general public.

The 2016 and 2020 Transportation Report Cards shall be designed to address the trends, assumptions and forecasts contained in Chapter 5 of this plan. Data for the Report Cards shall be obtained from sources cited in Chapter 5 and from replication of the travel survey conducted as part of this plan and described in Appendix E to the plan.

The Report Cards shall be used to guide and inform the 2021 update of this Multimodal Land Transportation Plan.

Key Variables

Data to be included in the Transportation Report Cards shall include, but not be limited to:

- Resident population
- Visitor population
- Combined “de facto” population
- Vehicle miles traveled – total and per capita
- Motor fuel consumption – total and per capita
- Greenhouse gas emissions from ground transportation
- Vehicle collision rate
- Mode share
- Transit demand
- Adult physical activity
- Annual transportation costs per household

Performance Reporting

The Transportation Report Cards shall specifically be designed to report on the progress made during the intervening years toward achieving the Preferred Scenario. The Report Cards shall also evaluate the County’s investments and budget priorities, comparing them to the guidance and priorities set forth in this chapter. Finally, the Report Cards shall offer guidance about revising priorities and policies as needed in the 2021 plan update.